



# APPLICATION DATA SHEET

Electronic Version v14

Stylesheet Version v14.0

<b>Title of Invention</b>	UBIQUITOUS CONNECTIVITY AND CONTROL SYSTEM FOR REMOTE LOCATIONS		
Application Type :		provisional, utility	
Attorney Docket Number :		7062-03-04	
Correspondence address:			
Customer Number:		23983	
<p>Inventor Information:</p> <p><u>Inventor 1:</u></p> <p><b>Applicant Authority Type:</b> Inventor</p> <p><b>Citizenship:</b> US</p> <p><b>Given Name:</b> Charles</p> <p><b>Family Name:</b> SHAMOON</p> <p><b>Residence:</b></p> <p><b>City of Residence:</b> Little Elm</p> <p><b>State of Residence:</b> TX</p> <p><b>Country of Residence:</b> US</p> <p><b>Address-1 of Mailing Address:</b> 2436 Tisbury Way</p> <p><b>Address-2 of Mailing Address:</b></p> <p><b>City of Mailing Address:</b> Little Elm</p> <p><b>State of Mailing Address:</b> TX</p> <p><b>Postal Code of Mailing Address:</b> 75068</p> <p><b>Country of Mailing Address:</b> US</p> <p><b>Phone:</b></p> <p><b>Fax:</b></p> <p><b>E-mail:</b></p>			
<p>Attorney Information:</p> <p>practitioner(s) at Customer Number:</p> <p>23983 </p> <p>as my attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.</p>			

Resideo Technologies, Inc. v. Ubiquitous Connectivity, LP

IPR2019-01335

Patent # 8,064,935

Exhibit # 1005

## FEE TRANSMITTAL

Electronic Version v09

Stylesheet Version v08.0

<b>Title of Invention</b>	UBIQUITOUS CONNECTIVITY AND CONTROL SYSTEM FOR REMOTE LOCATIONS		
Application Number :			
Date :			
First Named Applicant:		Charles SHAMOON	
Attorney Docket Number:		7062-03-04	
<b>TOTAL FEE AUTHORIZED \$ 80</b>			
Patent fees are subject to annual revisions on or about October 1st of each year.			
Filing as small entity			
BASIC FILING FEE			
Fee Description		Fee Code	Amount \$
Provisional Filing Fee		2005	80
			80
		Subtotal For Basic Filing Fee: \$80	
<b>AUTHORIZED BILLING INFORMATION</b>			
<b>The commissioner is hereby authorized to charge indicated fees and credit any overpayments to:</b>			
Deposit account number:		500498	
Access Code		****	
Deposit name:		MILLS LAW FIRM PLLC	
Deposit authorized name:		Michael C. Phillips	
Signature:		/Michael C. Phillips/	
Date (YYYYMMDD):		2004-11-18	
Charge Assignment Fees Required Under 37 C.F.R. Section 1.21 (h).			
Charge the Issue Fee Set in 37 C.F.R. Section 1.18 at the Mailing of the Notice of Allowance			
Charge Any Additional Fee Required Under 37 C.F.R. Sections 1.16 and 1.17.			

<b>TRANSMITTAL</b>
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Electronic Version v1.1

Stylesheet Version v1.1.0


<b>Title of Invention</b>	<b>UBIQUITOUS CONNECTIVITY AND CONTROL SYSTEM FOR REMOTE LOCATIONS</b>	
Application Number :		
Date :		
First Named Applicant:	Charles SHAMOON	
Confirmation Number:		
Attorney Docket Number:	7062-03-04	
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Submitted By:		Elec. Sign.
Michael C. Phillips Registered Number: 42,072		/Michael C. Phillips/ Sign. Capacity Attorney

Documents being submitted:	Files
us-fee-sheet	70620304-usfees.xml us-fee-sheet.xsl us-fee-sheet.dtd
us-request	70620304-usrequ.xml us-request.dtd us-request.xsl
application-body	7062ABX.xml application-body.dtd Image1.tif Image2.tif Image3.tif isoamsa.ent isoamsb.ent isoamsc.ent isoamsn.ent isoamso.ent isoamsr.ent isobox.ent isocyr1.ent isocyr2.ent isodia.ent isogr1.ent isogr2.ent isogr3.ent isogr4.ent isolat1.ent isolat2.ent isomfrk.ent isomopf.ent isomscr.ent isonum.ent isopub.ent isotech.ent mathml2.dtd mathml2-qname-1.mod mmlalias.ent mmlextra.ent soextblx.dtd us-application-body.xsl wipo.ent
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description-pdf	7062ABX-desc.pdf
drawings-pdf	7062ABX-draw.pdf
<b>Comments</b>	

## ACKNOWLEDGEMENT RECEIPT

Electronic Version 1.1

Stylesheet Version v1.1.1

<b>Title of Invention</b>	<b>UBIQUITOUS CONNECTIVITY AND CONTROL SYSTEM FOR REMOTE LOCATIONS</b>																																																																																																				
<p>Submission Type : Provisional Application</p> <p>Application Number: 60/522887 </p> <p>EFS ID: 72748</p> <p>Server Response:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Confirmation Code</th> <th>Message</th> </tr> </thead> <tbody> <tr> <td>ISVR1</td> <td>Submission was successfully submitted - Even if Informational or Warning Messages appear below, please do not resubmit this application</td> </tr> <tr> <td>ICON1</td> <td>2887</td> </tr> <tr> <td>USPTOEFSNotFor assistance with e-filing a patent application, contact the Patent Electronic Business Center: Toll-Free Number:1(866) 217-9197 Website: <a href="http://www.uspto.gov/ebc/">http://www.uspto.gov/ebc/</a></td> <td></td> </tr> </tbody> </table>		Confirmation Code	Message	ISVR1	Submission was successfully submitted - Even if Informational or Warning Messages appear below, please do not resubmit this application	ICON1	2887	USPTOEFSNotFor assistance with e-filing a patent application, contact the Patent Electronic Business Center: Toll-Free Number:1(866) 217-9197 Website: <a href="http://www.uspto.gov/ebc/">http://www.uspto.gov/ebc/</a>																																																																																													
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<p>First Named Applicant: Charles SHAMOON</p> <p>Attorney Docket Number: 7062-03-04</p> <p>Timestamp: 2004-11-18 12:47:09 EDT</p> <p>From: US</p> <p>File Listing:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Doc. Name</th> <th style="width: 40%;">File Name</th> <th style="width: 15%;">Size (Bytes)</th> <th style="width: 25%;">Date Produced (yyyymmdd)</th> </tr> </thead> <tbody> <tr><td>us-fee-sheet</td><td>70620304-usfees.xml</td><td>1610</td><td>2004-11-24</td></tr> <tr><td>us-fee-sheet</td><td>us-fee-sheet.xml</td><td>24912</td><td>2004-11-24</td></tr> <tr><td>us-fee-sheet</td><td>us-fee-sheet.dtd</td><td>10032</td><td>2004-11-24</td></tr> <tr><td>us-request</td><td>70620304-usrequ.xml</td><td>1245</td><td>2004-11-24</td></tr> <tr><td>us-request</td><td>us-request.dtd</td><td>19064</td><td>2004-11-24</td></tr> <tr><td>us-request</td><td>us-request.xml</td><td>33904</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>7062ABX.xml</td><td>27514</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>application-body.dtd</td><td>49498</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>Image1.tif</td><td>817413</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>Image2.tif</td><td>818446</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>Image3.tif</td><td>564587</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isoamsa.ent</td><td>5191</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isoamsb.ent</td><td>3988</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isoamsc.ent</td><td>1460</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isoamsn.ent</td><td>5620</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isoamso.ent</td><td>1934</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isoamsr.ent</td><td>7073</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isobox.ent</td><td>3568</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isocyr1.ent</td><td>5345</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isocyr2.ent</td><td>2504</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isodia.ent</td><td>1508</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isogr1.ent</td><td>4030</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isogr2.ent</td><td>2259</td><td>2004-11-24</td></tr> <tr><td>application-body</td><td>isogr3.ent</td><td>3559</td><td>2004-11-24</td></tr> </tbody> </table>		Doc. Name	File Name	Size (Bytes)	Date Produced (yyyymmdd)	us-fee-sheet	70620304-usfees.xml	1610	2004-11-24	us-fee-sheet	us-fee-sheet.xml	24912	2004-11-24	us-fee-sheet	us-fee-sheet.dtd	10032	2004-11-24	us-request	70620304-usrequ.xml	1245	2004-11-24	us-request	us-request.dtd	19064	2004-11-24	us-request	us-request.xml	33904	2004-11-24	application-body	7062ABX.xml	27514	2004-11-24	application-body	application-body.dtd	49498	2004-11-24	application-body	Image1.tif	817413	2004-11-24	application-body	Image2.tif	818446	2004-11-24	application-body	Image3.tif	564587	2004-11-24	application-body	isoamsa.ent	5191	2004-11-24	application-body	isoamsb.ent	3988	2004-11-24	application-body	isoamsc.ent	1460	2004-11-24	application-body	isoamsn.ent	5620	2004-11-24	application-body	isoamso.ent	1934	2004-11-24	application-body	isoamsr.ent	7073	2004-11-24	application-body	isobox.ent	3568	2004-11-24	application-body	isocyr1.ent	5345	2004-11-24	application-body	isocyr2.ent	2504	2004-11-24	application-body	isodia.ent	1508	2004-11-24	application-body	isogr1.ent	4030	2004-11-24	application-body	isogr2.ent	2259	2004-11-24	application-body	isogr3.ent	3559	2004-11-24
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## UBIQUITOUS CONNECTIVITY AND CONTROL SYSTEM FOR REMOTE LOCATIONS

### DESCRIPTION

[Para 1] The present invention relates to a monitoring and control system for the environment of a remote location. More specifically, the system relates to on demand bidirectional communication between a remote access unit and a multifunctional base unit in a geographically remote building.

[Para 2] In addition to a main residence, modern times provide people and families with a vacation home that is geographically remote from the regular place of residence. Also, owners of businesses generally have their place of business remote from their residence. These structures tend to be affected by changes in environmental characteristics, either natural (i.e., weather conditions), or non-natural (i.e., vandalism, break-ins, etc.). Generally, a thermostat for monitoring the ambient temperature and regulating a heating/cooling appliance to keep the building within the predefined temperature range accomplishes the typical environmental control. However, it is become more prudent to be energy efficient, among other things. Insomuch, that the typical thermostat only monitors the ambient temperatures, however, where the building is in a volatile climatic region, it is not always feasible to maintain the full functions of the appliances year round. For example, a building located in a region known for very warm temperatures, if the owner resides several hundred miles away, there would be no need to activate a cooling system on an abnormally warm day during a virtually cool season. There is no system found that monitors the ambient environmental factors within a predefined range of values, upon an exception to the predefined values, alerts the remotely located owner, and allows the owner to remotely redefine the acceptable environmental parameters. Thus a remote control system solving the aforementioned problem, as well as several others, is desired.

[Para 3] The home control industry is a rapidly growing, multi-billion dollar industry. This growth has been accompanied by the recent development

of smart appliances and efforts to development a universal protocol for home control by major companies. The present invention provides the next major development in today's home control industry, ubiquitous connectivity and control of structure environment.

[Para 4]           The home control industry has taken steps toward ubiquitous connectivity and control over the years, but these steps have fallen short until now. The home control industry has moved from ultrasonic remote control to infrared remote control to local RF remote control and on to land-line phone home-away-from-home remote control. The advent of improved cell phone technology provided more mobility and convenience to home-away-from-home control. High-speed and wireless Internet access has allowed connectivity to the home through home-based and wireless laptop computers. While an advance in connectivity, mobile Internet connectivity, like its predecessors, is not without significant challenges, especially with mobility and convenience.

[Para 5]           The present invention uses an on-demand digital, private, and direct ubiquitous communications interface to overcome the shortcomings and limitations of current communications interfacing. A digital, private, and direct-connect ubiquitous controller provides instant wireless private direct connectivity to the home from anywhere in the world without dialing a number or waiting for a number of tones to send a command or to know the status of conditions in the home; provides silent and constant direct two-way communication privately and globally, with home for control and monitoring of key functions; eliminates limitations, immobility, and inopportunities to connect, monitor and control your home, globally; can be configured to interface with many existing and future home automation systems and technologies; providing instant ubiquitous control for the end-user; and eliminates the need for the PC, modems and interconnected wiring.

[Para 6]           The digital private direct connect ubiquitous controller allows the end-user to finally realize true global connectivity to and control of the home.



**[Para 7]** The above features and advantages of the present invention will become apparent upon reading the following description taken in conjunction with the accompanying drawings in which:

**[Para 8]** Figure 1 is a block diagram illustrating a connectivity and control system according to an embodiment of the present invention;

**[Para 9]** Figure 2 is a block diagram of the base unit of the system of Figure 1;

**[Para 10]** Figure 3 is a block diagram of the remote unit of the system of Figure 1.

**[Para 11]** Similar reference characters denote corresponding features consistently throughout the attached drawings.

**[Para 12]** Referring to the drawings, Figure 1 illustrates a ubiquitous connectivity and control system 10 wherein certain parameters are controlled from a geographically remote location 12 by a remote unit 14 on demand interfacing with a base unit 16 in a structure 18 at a local location 20 through a short message and/or the data bearer cellular telephone network 22 including control towers 24.

**[Para 13]** Referring to Figure 3, the remote unit 14 consists of a dedicated system microcontroller 30, a wireless interface module 32 including antenna 33, a universal serial bus interface (USB) 34, a GPS Receiver Module 36, an LCD Display 38, and a keypad 40.

**[Para 14]** The remote unit 14 communicates with the base unit 16 to affect the operational aspects thereof and peripheral equipment operatively attached thereto. For example, the remote control unit may command the base unit 16 to enter an energy conservation mode. Upon entering this mode the base unit 16 would adjust air handling systems, open or close dampers, open or close window coverings, and adjust operation of a hot water heater in order to conserve power consumption of the home.

**[Para 15]** Multiple control units may be configured to work with a single base unit. In such configuration, one of the remote units would be considered a master and all others would be considered to be slaves. Specific operational

characteristics of the base unit may be configured in such a way as to only respond to commands from the master remote unit.

[Para 16]        The GPS receiver module 36 including antenna 37 is incorporated into the remote unit 14 for allowing the remote control unit to communicate position information back to the base unit 16. The GPS may also be incorporated into wireless Module 32, as in newer CDMA 2000 compatible cellular modules. This feature allows the base unit to change its operational characteristics based upon the location of the remote control unit(s). For example, the base control unit may adjust the water temperature and thermostats when one of the remote control units comes within a specific distance from the house. The geographic information that is acquired by the GPS subsystem in the remote unit (whether it is a separate GPS unit or part of the module) can be compared to settings stored in either the remote unit itself or the base control unit to provide capabilities such as Geo-Fencing, Asset Tracking, and Bio-Location (knowing where a living entity is located). Specific remote control units can be configured in such a way that they send a status message to the base control unit if they exceed a programmed set of boundary conditions.

[Para 17]        Additional geographical dependent operation or control may be provided by the inherent aspects of the cellular network 22. The cellular system therefore has associated with it a System ID and every tower 24 within the system has a cell ID. This information is transmitted to the mobile unit on the control channel so that the mobile knows if it is roaming, etc. In addition, the control channel also sends what is called a Neighbor list of channels and Cell IDs to the mobile so that it knows what other towers are nearby and whether it is moving away or towards a tower. In this way the mobile can select a tower that has a stronger signal.

[Para 18]        By acquiring this cell ID and neighbor list information while a user is in their home (residence or other place they want to know when they are close to it) and storing it in memory, the software in the mobile can then compare the currently active cell list to the one in memory and determine if it is coming towards or leaving the location of interest. The mobile can then send

commands appropriate to the case, such as setting back the thermostat, arming the alarm system etc.

[Para 19] The base unit will communicate status information to the remote control unit either on a periodic or event-driven basis. Examples of events that could cause the base unit to initiate a communications session with the remote control unit include fire or burglar alarm activation, temperature thresholds exceeded, equipment failures, a change in the homes state vector, (occupied, unoccupied) or a geographical boundary condition exceeded by one of the other remote units.

[Para 20] The LCD display 38 and keypad 40 are connected to the system microcontroller 30 through an I<sup>2</sup>C bus 50. Both the LCD display 38 and the keypad 40 have integrated I<sup>2</sup>C communications devices that allow them to communicate over the I<sup>2</sup>C bus 50.

[Para 21] The USB interface 34 is connected to the system microcontroller 30 through a parallel data bus 52. The parallel data bus 52 allows for high speed data transfers to and from the system microcontroller 30 and the USB interface 34.

[Para 22] The wireless interface module 32 is connected to the system microcontroller 30 through an RS232 serial bus 56 and a power control bus 58. The RS232 serial bus 56 is used for controlling the signaling aspects of the wireless interface module 32 and for sending short messages and/or data packets. The power control bus 58 is used to place the wireless interface module 32 in either an active, idle, or power-off state.

[Para 23] The GPS module 36 is connected to the system microcontroller 30 through RS232 bus 59. The GPS module 36 is controlled and reports position information at a periodic rate over this communications bus.

[Para 24] Referring to Figure 2, the base unit 16 consists of a number of separate subsystems each controlled by a dedicated microcontroller. The microcontroller communicates with each of the subsystem components using either a serial or parallel communications bus depending upon the capabilities of the particular subsystem component.

**[Para 25]** The subsystems contained within the base control unit 16 consist of either off-the-shelf integrated circuits combined with discreet components or complete modules provided by other original equipment manufacturers, (OEMs). As there are many different providers of components and modules, only one particular method of systems design and integration is described herein. Those skilled in the art will recognize that there are many ways to put together components and modules to achieve a design with similar features.

**[Para 26]** The base unit 16 includes a plurality of communication interfaces 66, 67, 68, 69, 70, 72 74, 76 and 78 for providing the means for remote control and remote monitoring of the various subsystems within the residential environment. Remote monitoring and control can be achieved through either the wireless interface 60 or the Ethernet interface 72. A multi-purpose expansion bus 78 is a proprietary bus providing a custom communications interface for accessories developed exclusively for use with the base control unit.

**[Para 27]** Software within the systems microcontroller 100 provides for autonomous control that is either preprogrammed at the time of manufacture or customized by the end user of the base station for their specific needs. Examples of autonomous control include: shut down of the air handling system if a fire is detected, thereby the spread of smoke and the possibility of “fanning” the fire; adjusting of indoor temperature and humidity settings depending upon conditions and information such as outdoor environmental conditions such as temperature, humidity, sun load and wind, short-term weather forecasts, family schedule and activities, structure occupancy, context, location of users; shutdown of sensitive electronic components and subsystems in cases of severe weather, or failures in other subsystems; closing and opening of windows and/or window coverings to conserve energy; control of sprinkler systems based upon current weather conditions and weather forecasts.

**[Para 28]** The base unit 16 consists of an antenna 82 which is attached to the wireless interface module 60. The antenna connection may be made

either directly through a connector incorporated as part of the antenna or through a coaxial cable so that the antenna 82 may be mounted at a location remote from the base unit.

**[Para 29]** The wireless interface module 60 provides both voice and data communications capabilities to the base unit 16 through audio interface 84, power interface 86 and I/O interface 88. A microphone 90 and a speaker 92 provide for voice communications to the user through the audio interface 84 of the wireless interface module 60. The power interface 86 provides power to the module 60 via power supply 94 and also allows the system microcontroller 100 to control the on/off state of the module. The power supply 94 is connected to the structure power supply through connector 96. The I/O interface 88 provides for a data pathway for digital communications over bus 102 as well as providing the means for the system microcontroller 100 to control the various communications aspects of the wireless module 60.

**[Para 30]** The user interacts with the base station through keypad 110 and LCD display 112 to the system microcontroller 100. Software embedded into the on-board ROM of the microcontroller 100 provide the functionality for interpreting the keypad 110 input and for displaying appropriate messages on the LCD display 112.

**[Para 31]** The interfaces of the base unit 16 provide for the control and the monitoring of a variety of subsystems within the residential environment as well as providing a means of expanding the functionality of the base station through the use of industry standard interface technologies including a universal serial bus, USB 70; the Ethernet (10/100Base-T) bus 72 and the RS-232 serial bus 69.

**[Para 32]** The interface 68, environmental sensor network, is implemented as a 1-Wire® network allowing for a number of various types of temperature, humidity, light-level and other sensors to be monitored by the base unit 16. The 1-Wire® network is expandable to a wide array of devices including general purpose digital and analog I/O devices which would allow for the control of actuators and relays that may be useful for control of air

dampers, water control valves, electronic windows, vents and other such devices utilized within a typical residential environment.

[Para 33] The interface 67, the air handling control systems interface, provides the means by which the base station serves to control the heating, air conditioning and other air handling equipment within the residence. This interface is designed to replace the standard thermostat that is typically used within residential heating and cooling systems. The interface 67 may provide multi-zone thermostat functions control as well as an interface to electronic air dampers.

[Para 34] The serial data bus interface 69 allows for data communications with the wide range of devices on the market that support this type of communications interface. Examples of such data communications: desk top computers, modems, and fax machines.

[Para 35] The USB interface 70 allows the base control unit 16 to communicate with other devices that support this type of interface. This bus can be used to expand the capabilities of the base station and add support for: persistent data storage; peripheral expansion devices (digital cameras etc); other wireless interfaces (Bluetooth, 802.11).

[Para 36] The Analog and Digital I/O interfaces 74 and 76 respectively allow the base unit to connect to a wide array of devices that interface to the real world. This allows the base unit to serve as a bridge between simple devices and the networks to which the base station is connected. Examples of such would include: alarm systems; electronic locks; gate controls; pressure transducers; contact closures; and relays.

[Para 37] The multi-purpose expansion bus 78 is a proprietary bus that allows for the addition of custom accessories developed exclusively for use with the base station.

[Para 38] The present invention thus provides an on-demand bidirectional communications interface for monitoring, controlling, and securing various environment functions and characteristics attendant the interior and exterior of a building. The system may thus monitor and control

temperature, and a myriad of other environmental functions of the building include, by way of example and not limitation, temperature, power status for the building and discrete applications therein, humidity/moisture, smoke/toxic gases, structural breaches, security status, visual conditions and a host of other natural and non-natural phenomena.

**[Para 39]** The base unit is preferably mounted at an appropriate location on a wall within the building to provide a local access for regulation. The base control unit is locally operatively interfaced with a plurality of sensors and devices systematically distributed throughout the building and communicating according to varying protocols such as infrared, radio frequency, X-10, and hard wiring.

**[Para 40]** The sensors provide continuous measurement and status of target environmental characteristics. Examples of sensor applications include utilities status, moisture and humidity detection, door and window condition, and the like. Associated controlled devices providing operational functions refrigeration, water heating, security cameras, illumination devices, and the like.

**[Para 41]** The air handling unit to signals from the associated sensors and based on the processed measured characteristics thereof, activates or deactivates one or more of the devices of the unit in response to the measurement. For example, if the temperature sensor exceeds a preset value, the HVAC unit is activated, and when the measured characteristic is within a preset value range, the unit is deactivated. In addition, when a measured characteristic exceeds a predetermined value range, an alarm signal may be transmitted to a remote unit 14 to provide an audible, tactile, and/or visual indication. Thus, if utility sensor S2 indicates a loss of electrical, water, or communications service, a signal is sent to the remote unit and the operator thereof has the ability to take corrective action in response thereto. Also, the operator may invoke the a command from the remote unit to the base unit 14 to activate a select device such as the HVAC unit, a water heater, a refrigeration appliance or other discrete device remotely in order to prepare the building for occupancy by the operator or designee.

**[Para 42]** The sensors for the system are distributed throughout the building to detect the environmental characteristics of the building. These characteristics include, but are not limited to, temperature, humidity/moisture, smoke/toxic gases, structural breaches, and a host of other natural and non-natural phenomena. In a conventional thermostat, a temperature sensor and switch automatically control a heating or cooling appliance when the sensed temperature is beyond a preset value. The thermostatic interface of the invention would include a temperature sensor that constantly monitors the environmental temperature and control of a heating and/or cooling appliance to maintain the building at a substantially constant temperature. The thermostatic interface also receives other environmental characteristics of the building and responds in a like manner. For example, a sensor would monitor the humidity (or moisture content of the air) of the building. If the temperature monitored by temperature sensor is within the preset range value, a conventional thermostat would not adjust the heating and/or cooling appliance to regulate the moisture content, thus presenting favorable environment for the growth on molds and mildew. The thermostatic interface receives the humidity value measured by the humidity sensor, determines that the value exceeds a predefined limit, and generates an alarm signal that is transmitted as an alarm signal via the communication link to the remote unit. The operator receives the information and transmits a control signal from the remote access unit to the base unit via the communication link and activates the appropriate appliance in response thereto, thus reducing the humidity value to acceptable levels and preventing the progression of mold and mildew growth. The sensors are distributed according to a predetermined plan that effectively makes the “most likely place” for a change in environmental characteristics to be sensed. For example, several smoke/toxic gas sensors would be distributed about the ceilings and floors so as to identify the presence of smoke (i.e. fire) or carbon monoxide (i.e. toxic gas), and relaying the measured characteristic to the thermostat. Other types of sensors would be optimally placed in order to monitor the egression of water into the building, lighting striking the building, suspension or cessation of a provided utility (i.e., electric power, water and sewer provisions, natural gas), collapse of



the building or a portion thereof due to weather (i.e., tornado, hurricane, blizzard), or breach of the building security (i.e., break-ins). The sensors may be hard wired through the structure of the building. Also, the sensors may have a wireless communication. The optimal presentation would be a dual connection, such a hard-wired and wireless communication, e.g., a transmitter/receiver. This provides maximum effective monitoring of the building because the hard wiring would alleviate the need for constant battery monitoring, likewise, the wireless communication provides monitoring should the absence of electrical power be a factor. For example, the combined hard wired and wireless connection of the sensors to the unit allows the monitoring of the building and generates the alarm when the power is lost due to an area wide electrical outage. The unit transmits that information (i.e., the loss of electrical power) to the remote unit and the operator is aware that the electrical power is absent. If the loss of electrical power were due to a nefarious figure seeking to breach the building, i.e., breaking a window to gain access, a security sensor would still be able to provide the thermostat with an indication that the building has a security breach. The base unit, operating under an alternate electrical power supply such as a backup battery, would generate a subsequent alarm signal and transmit the subsequent alarm signal for routing through the direct connect wireless for immediate transmission to the remote unit, thereby alerting the operator that in addition to the loss of electrical power, the security of the building has been breached. The operator can thereby contact the law enforcement facility of the local jurisdiction and have an immediate response.

**[Para 43]** In addition to main residence use, the system is typically suited for a vacation/second dwelling, a business concern, or any building structure that is not constantly occupied. For example, if the thermostat control system is installed in a vacation home in one locality, the operator may effectively be in any other portion of the globe so long as an effective communication link is provided with the remote unit.

**[Para 44]** It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claim.

**What is claimed is:**

**[Claim 1]** 1. A control system for use in a building having at least one controllable apparatus, said system comprising:

a sensor operatively connected with the apparatus for assessing an operating parameters thereof, and producing a signal in response thereto;

a remote control unit and a base control unit; instant wireless private direct connectivity means operatively interconnecting said remote control unit and said base control unit; means associated with said base control unit for assessing an operating parameter of the apparatus and sending a data communication with respect thereto to said connectivity means; a means associated with remote control unit for receiving said data communication from said connectivity means for generating user interpretable information with respect thereto.

## **ABSTRACT**

A thermostat control system for monitoring and controlling environmental characteristics of a building includes a base station unit and a remote access unit continuously interfacing through instant wireless private direct connectivity. The system also includes a plurality of sensors that measure the environmental characteristics and provide the thermostat unit with the measurements.

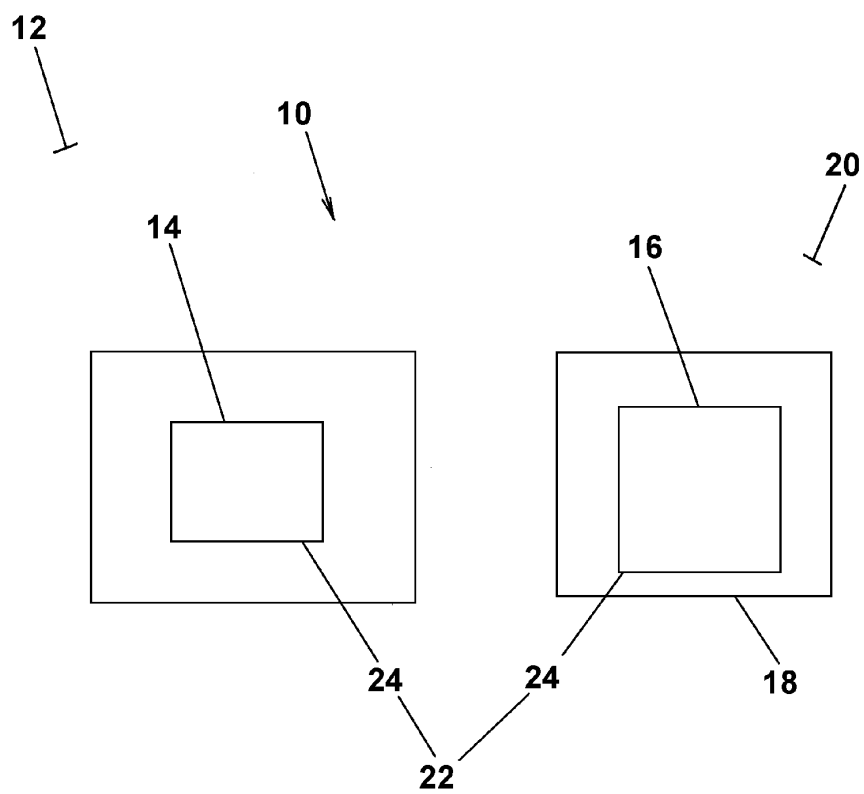


FIG. 1

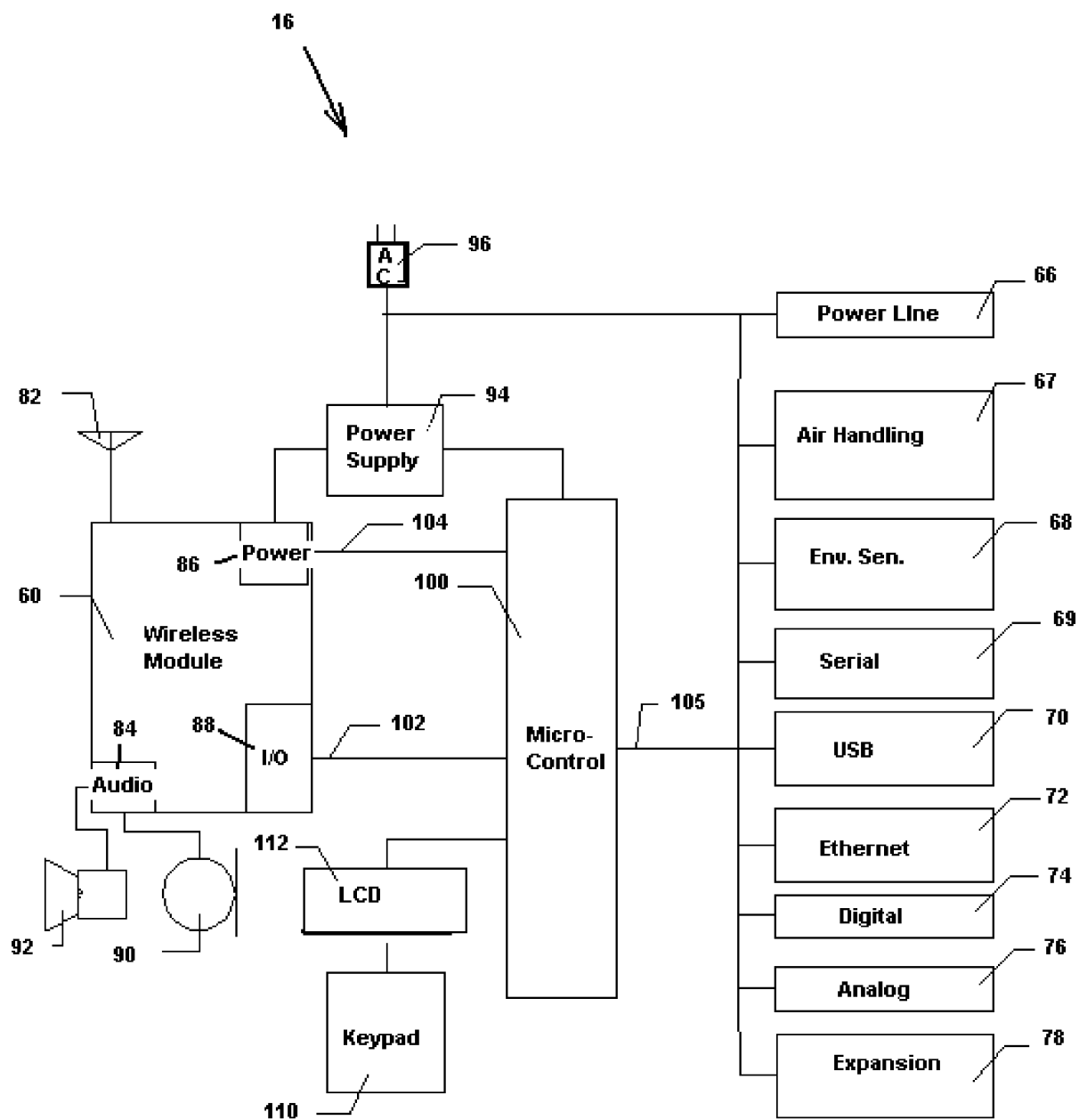


FIG. 2

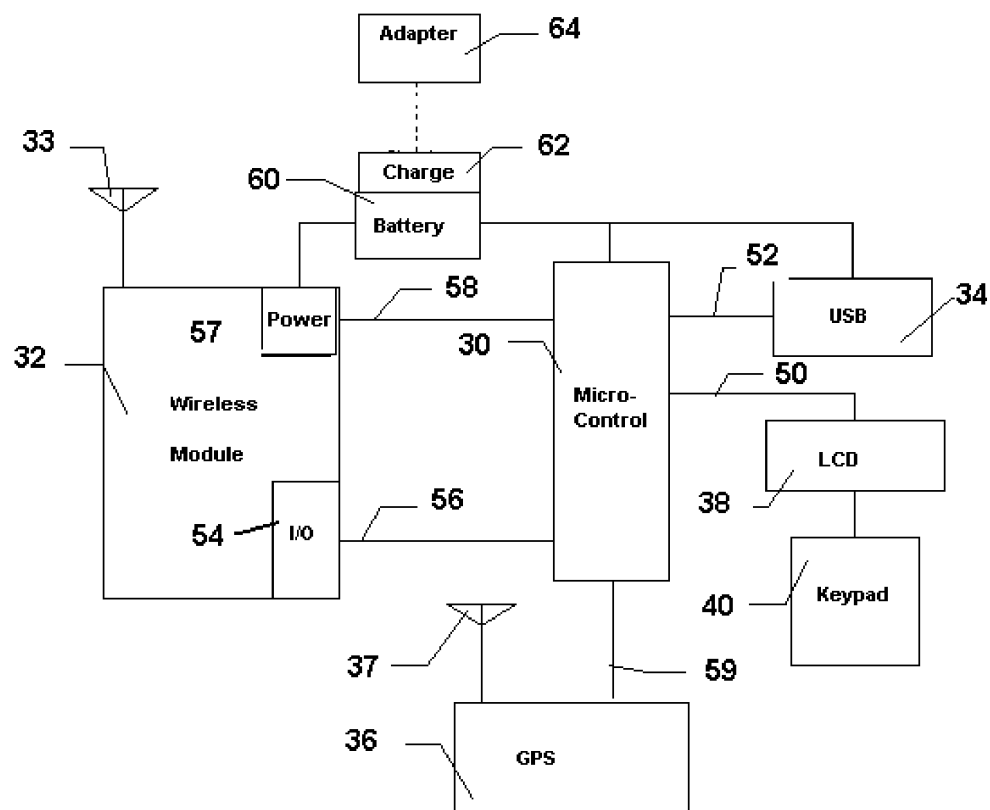


FIG. 3