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РЕГИСТРАТОРЫ ДАННЫХ

Технические характеристики

на SIP-CB

1 PRODUCT DESCRIPTION

The main processing module in this product is also used in other products and is known as the “SIP-CB”.
This, combined with additional analog circuitry, forms a product called the “SIP-CB/a.

1.1 Product Overview

Many metering devices generate electrical pulses to indicate what they are measuring. A gasoline pump might produce one pulse for every liter of fuel dispensed. A vending machine might generate one pulse for each beverage purchased. For these pulses to have meaning there must be a way to count them and store the totals for later processing. In the vending machine example this information might be gathered electronically at the end of each day to see if the machine needs to be refilled without the need to send a person to each site.

The SIP-CB/a is designed to count low-frequency pulses over a specific period of time ranging from 1 minute to 60 minutes and save the total count as one record. It then repeats this process for the next time period and can do this for hours, days or months at a time. The SIP-CB/a can count pulses from four independent sources simultaneously. The SIP-CB/a also has four other inputs for alarm or status processing.

The Isolated Linear Integrator, or “ILI”, is a small circuit board that converts a steadystate

(dc) analog voltage signal into a stream of digital pulses that the SIP-CB can count. The ILI can accept voltages up to 150 Vdc. The ILI can provide complete isolation between the voltages being measured and the SIP-CB. The SIP-CB/a can contain one or two ILI boards.

At some point the SIP-CB/a must transmit its records and alarm status to a central computer system for processing and to make room for new records. Traditionally data logging devices have used wired telephone lines and modems to communicate with central computer systems. But in some cases the devices may have to be located in very remote locations and the cost of running phone lines to those locations may be quite high. Additionally the monthly cost of wired phone service has greatly increased.

Operating as a wireless modem, a connection is made using a commercial GSM digital cellular phone network. The SIP-CB/a supports the four most common GSM bands: 850, 900, 1800 and 1900 MHz. It supports either circuit-switched data (CSD) or Internet (packet) communications if these services are offered by the cellular service providers.

In addition to processing input signals the SIP-CB/a can produce four output signals. These signals can be controlled from the central computer and can be used to activate external equipment such as pumps, lights or audible alarms. Alternatively any output can replicate the signal that is present on any pulse or alarm input. This allows other pulse-counting or alarm-sensing equipment to have access to the same information.

1.2 Power Requirements

The main processing module (SIP-CB) is powered from one 3.6V, 38 A/hr lithium battery pack. Battery life is primarily a function of the battery's amp-hour rating, how often the SIP-CB/a is allowed to call the central computer and how often calls have to be repeated due to poor signal conditions. The radio consumes the most power. If the SIP-CB/a makes seven 1-minute calls per day you can expect a battery life of 2 years or more.

Alternatively this module can be powered from a regulated and filtered 3.6Vdc power supply. This would be required if you wish to call or page the SIP-CB/a. In these cases the radio must remain powered up at all times and would quickly drain a battery.

Each ILI board is powered by one 3.6V, 19 A/hr lithium battery pack. Service life is approximately 2.2 years. Two ILI boards can be operated from one battery but the service life will be reduced to about 1 year.

Alternatively the ILI boards can be powered from a low-current dc power supply in the range of 3 – 12 Vdc.

See Chapter-2 for more information about power sources.

1.3 Enclosure

All components are housed in a weather resistant NEMA enclosure than can be locked for added security. There is one cable entry port on the bottom of the box. See Chapter-2 for dimensions and views.

1.4 DC-2000 Data Collection System

Honeywell offers a powerful data collection system called "DC-2000" that can collect information from thousands of devices, store their data in a database and present the results to you in a variety of formats. It can also notify you immediately when an alarm condition occurs. DC-2000 supports both CSD (circuit-switched data) and packet (Internet) connections.

1.5 CSD versus Packet (Internet) Mode

The SIP-CB/a can communicate with the central computer's modem using a circuitswitched data (CSD) connection or it can exchange information with the central computer over the Internet using "packet" mode. There are advantages and limitations to each method.

1.5.1 CSD Mode

CSD mode is similar to two modems communicating over a wired telephone line. This is very similar to a "dial up" connection between your home computer and your Internet Service Provider.

The cellular service provider has banks of analog modems available in their switching centers. When it detects a CSD call it connects one of its own modems to the wired line and dials the central computer's modem. Data is transferred between the SIP-CB/a and the switching center over the radio link, and then between the switching center and the destination modem via wire. Cellular service providers often offer this service as an addon package to a standard "voice" account, and each call is measured and billed in terms of minutes used. Depending upon the frequency and length of the calls this service can become quite expensive. In situations in which the calls are long distance it may be possible to purchase plans that include free long distance in order to reduce costs.

Some cellular service providers may not support "mobile-terminate" connections, which means the SIP-CB/a can place a call to the computer but cannot be called by the computer. However the central computer can "page" the SIP-CB/a by dialing its voice number or by sending it a text message. This will cause the SIP-CB/a to immediately call back to the central computer. Paging or dial-outs are not recommended for batteryoperated units because the radio must remain powered up at all times and will quickly drain the battery.

CSD mode requires the use of a special modem chassis called a MODSMOD (modular smart modem). This chassis can hold up to 8 modem cards. The MODSMOD uses a special protocol known only to Honeywell devices and will reject any calls that do not follow this format. The 8 channels can hold a combination of 1200, 2400 and 9600 bps cards. A 9600 bps card is required for cellular communications whereas the slower cards support the legacy wire line Honeywell devices.

See Figure 1-1 for a simple illustration of a wireless CSD connection.

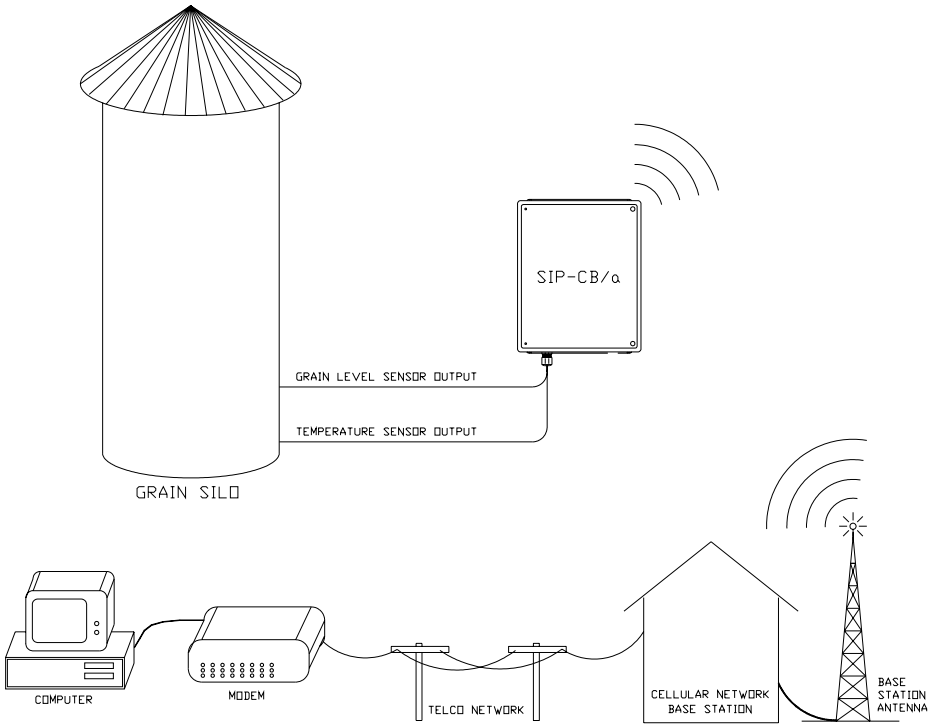

Figure 1-1
Data Collection System using CSD

1.5.2 Packet (Internet) Mode

Cellular service providers may offer access to the Internet using a service generally called “packet service”. On GSM networks this is called the general packet radio standard (GPRS). Data is exchanged in small blocks, or packets, with DC-2000. Cellular service providers may offer this service as an add-on package to a standard “voice” account, or may offer it as a stand-alone product. Each connection is usually measured and billed in terms of the amount of data exchanged each month. The amount of information exchanged on each call may range from several hundred bytes to 10’s of thousands of bytes, depending upon the information that is requested from the SIP-CB/a. It may be necessary to test the system for several months and then adjust the cellular account for the best cost based on your needs. For instance if you purchase one million bytes (1 Mb) per month but only use 100,000, you may be able to purchase a smaller and thus less expensive plan.

For security reasons the SIP-CB/a cannot be contacted via the Internet because it only acts as a “client”. It is not listening for connection requests from other devices. Only an Internet “server” does that. However the central computer can “page” the SIP-CB/a by dialing its voice number or by sending it a text message. This will cause the SIP-CB/a to immediately call back to the central computer. Paging is not recommended for battery-operated units because the radio must remain powered up at all times and will quickly drain the battery.

DC-2000 acts as an Internet server on your computer and thus must be allowed access to the outside world. Most corporate computer systems use firewall technology to prevent unauthorized and potentially damaging access from outside sources. To minimize potential invasion DC-2000 and the SIP-CB/a exchange private information using the 64-bit data encryption standard. If this exchange fails, the connection is immediately terminated.

An Internet address and port number must be assigned to the computer running DC-2000, and these numbers must be programmed into each SIP-CB/a. Your computer system's administrator usually assigns the address and port number. When the SIP-CB/a calls in it assigns itself what is known as a "source port" number. To further enhance security the SIP-CB/a can be assigned only one or a specific range of source port numbers and the firewall can be programmed to only allow these through.

See Figure 1-2 for a simple illustration of a wireless Internet connection.

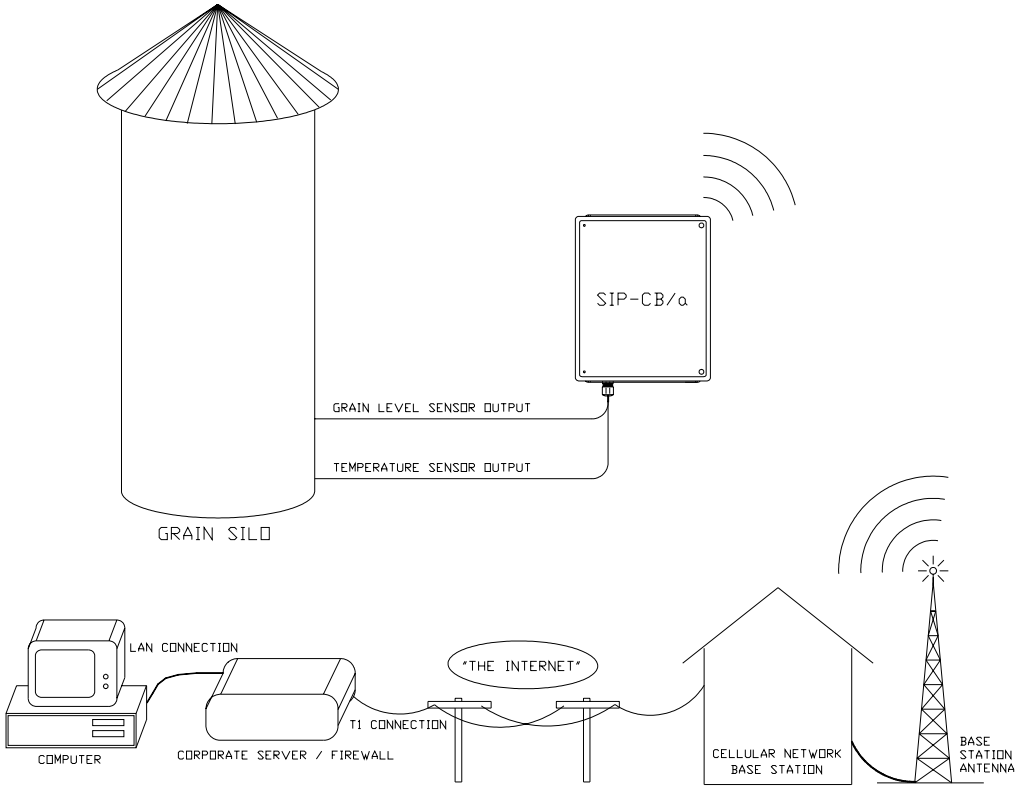

Figure 1-2
Data Collection System using the Internet

1.6 Communications Scenarios

There are several ways for the SIP-CB/a to communicate with the central computer:

Scenario #1: The SIP-CB/a initiates its own call to the central computer

- The SIP-CB/a determines that a call should be made due to an alarm condition or a regularly-scheduled call event.
- The cellular radio on the SIP-CB/a is powered up and establishes a connection with the cellular phone network.
- The SIP-CB/a initiates an outbound data call (CSD mode) or a packet (Internet) connection to the central computer, which is running DC-2000.
- The central computer processes the SIP-CB/a's data and stores it in a database structure format.
- The SIP-CB/a is given new instructions including when to call next. The call is then terminated and the radio is powered down (for battery-operated units) or remains powered up to listen for pages (for externally-powered units).

Scenario #2: The data collection computer initiates a data call to the SIP-CB/a in CSD mode.

- The SIP-CB/a's cellular radio is always powered up, is registered with the cellular network and is therefore always 'listening' for an incoming call.
- The central computer dials the radio's "data" number (this is known as a "mobile-terminate" CSD connection). When the radio answers the call it will establish a link with the computer, which is running DC-2000.
- The computer processes the meter's data and stores it in a database structure format.
- The SIP-CB/a is given new instructions including when to call next. The call is then terminated but the radio remains powered up to accept future calls.

This configuration is not recommended for battery-operated units because the radio must remain powered up at all times and will quickly drain the battery. A full-time power supply is required for this mode.

Scenario #3: The data collection computer “pages” the SIP-CB/a and waits for the SIP-CB/a to call back.

For security reasons the SIP-CB/a cannot be contacted via the Internet because it only acts as a “client”. It is not listening for connection requests from other devices. Only an Internet “server” does that. In CSD mode the cellular service provider may not support “mobile-terminate” connections, which means the SIP-CB/a can place a call to the central computer but cannot be called by the computer. In these cases the SIP-CB/a can be “paged”, which will cause the unit to call back immediately.

- The SIP-CB/a cellular radio is always powered up, is registered with the cellular network and is therefore always ‘listening’ for an incoming call or page.
- If the cellular account has been assigned a voice or data phone number, the computer calls that number. The SIP-CB/a answers the call and attempts to communicate with a modem (which is not there). After several seconds it hangs up and will immediately call the central computer as described in Scenario #1.
- If the cellular account includes a feature called SMS (short message service, used for text messaging between cellular phones), the computer can send a text message to the SIP-CB/a. When the SIP-CB/a receives the message it will immediately call the central computer as described in Scenario #1.

This configuration is not recommended for battery-operated units because the radio must remain powered up at all times and will quickly drain the battery.
A full-time power supply is required for this mode.

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