

Telecommunication Peripheral Products  
***Technical Practice***

**CA-4**  
Four Line Call Auditor  
March 15, 2000

## **Add Call Accounting Capabilities to Nearly Any Phone System!**

The **CA-4** provides a cost effective way to add call accounting features to any phone system.

The **CA-4** monitors up to four analog telephone lines for inbound and outbound call duration, time, date, and number dialed.

The **CA-4** buffers up to 1820 call records for later retrieval. The data can be formatted in ASCII delimited text to be downloaded to a PC via a RS-232 port. It can also be output to a serial printer in a tabular format.



***<http://www.VikingElectronics.com>***

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### **Features**

- Easy parallel wiring to analog lines/PABX extensions.
- Monitors up to four C.O. lines or analog PABX/KSU stations
- 1820 call record buffer
- Data button for on demand downloading
- Download data to a PC or print to a serial printer
- Download data remotely via modem
- Can output an ASCII delimited text file for use with spread sheet and database programs
- LED indicates operational mode
- Control manually or from a PC
- Battery back-up for memory
- Built-in clock/calendar with automatic leap year compensation

### **Applications**

- Monitor call activity in small offices and businesses
- Determine traffic patterns
- Verify long distance carrier charges
- Track down phone system hacking

***Sales...(715) 386 - 8861***

***Made in the U.S.A.***

### **Specifications**

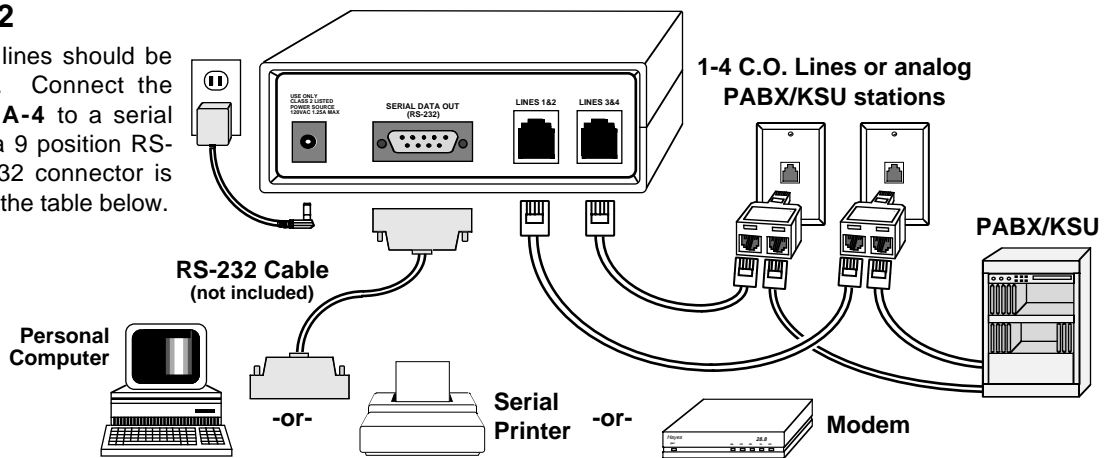
**Power:** 120V AC/13.8V AC, 1.25A UL listed adapter provided  
**Dimensions:** 133mm x 130mm x 38mm (5.25" x 5.1" x 1.5")  
**Shipping Weight:** 0.9 kg (2 lbs)  
**Environmental:** 0°C to 32°C (32°F to 90°F) with 5% to 95% non-condensing humidity  
**Connections:** (2) RJ14 jacks, (1) RS-232 serial port  
**Clock Battery Back-up:** Approximately 24 hours using a 9V standard or rechargeable battery (not included)  
**Time Base:** 60Hz AC Power

# Installation

## A. Lines and RS-232

The analog telephone lines should be connected in parallel. Connect the serial output of the **CA-4** to a serial printer or a PC using a 9 position RS-232 cable. The RS-232 connector is configured as shown in the table below.

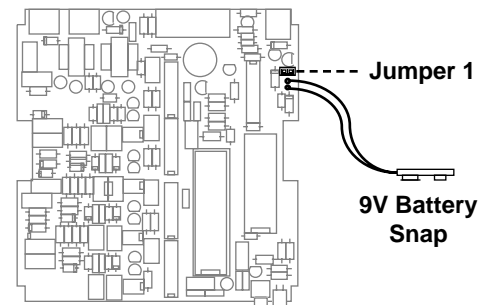
RS-232	Function
Pin 2	Transmit
Pin 3	Receive
Pin 4	DSR
Pin 5	Ground
Pin 6	DTR
Pin 7-8	CTS/RTS



## B. Clock Battery Back-Up

Battery back-up can be provided to maintain the clock operation. If battery back-up is desired, remove the cover from the **CA-4** and install a 9V battery onto the battery snap. Then remove the backing of the double back tape on the inside of the cover and press the battery firmly to the tape. The clock time will be maintained for approximately 24 hours.

The **CA-4** has a built-in charging circuit for rechargeable batteries. If a standard battery is used, **Jumper 1** must be removed before installing the battery (see diagram at right) to disable the charging circuit.



**Important:** Serious damage may occur if the battery charging circuit is not configured correctly. When using a rechargeable 9V battery, **Jumper 1** should be in place. When using a non-rechargeable battery, **Jumper 1** MUST be removed (see diagram above right).

# Programming

## A. Date and Time

### 1. Programming from a Touch Tone Phone

- Call one of the telecom devices connected to the **CA-4** using a Touch Tone phone.
- When the telcom device answers, enter a **\*** and the security code **"845464"** (**V-I-K-I-N-G**).  
**Note:** The security code can not be changed.
- To change the time and date, enter two Touch Tone digits for each parameter.

min hours day month year  
Example: 2:30pm March 9, 1998. Enter: **30 14 09 03 98**

**Note:** You must use a leading "0" if the value is less than 2 digits.

- When finished, hang-up.

### 2. Programming from a PC

- Connect the serial port of the PC to the **DATA** port of the **CA-4**.
- Establish serial communications (see section **C. Setting Up Your Communications Software**).
- To change the time and date, enter two digits for each, in the following order: minutes, hours, date, month and year. Press the <Enter> key to update the time and date.  
**Note:** You must use a leading "0" if the value is less than 2 digits. If there is an invalid entry, "PROGRAMMING ERROR" will appear on the screen. Simply reenter the values and press the <Enter> key again.
- Once the new programming values have been accepted by the **CA-4**, the new values will appear on the PC screen.

## B. Inbound DTMF Screening

The **CA-4** does not monitor for ring voltage. The only method of determining whether a call is an "inbound" or "outbound" call is the Touch Tones recorded. In certain situations Touch Tones may be entered on inbound calls, such as when an Auto Attendant or voice mail system is called. To compensate for these applications, you may set a maximum inbound Touch Tone filter. This filter will determine any call that uses fewer Touch Tones than the filter setting to be "inbound." All other calls will be labeled "outbound."

## 1. Programming from a Touch Tone Phone

- Call one of the telecom devices connected to the **CA-4** using a Touch Tone phone.
- When the telecom device answers, enter \* and the security code "845464" (**V-I-K-I-N-G**).
- Enter the Touch Tone filter number (0 - 9) + #.
- When finished, hang-up.

## 2. Programming from a PC

- Connect the serial port of the PC to the data port of the **CA-4**.
- Establish serial communications (see section **C. Setting Up Your Communications Software**).
- Enter the Touch Tone filter number followed by <Ctrl+E>.
- Once the new programming values have been accepted by the **CA-4**, they will appear on the screen.
- To check the Touch Tone filter number without changing it, enter <Ctrl+F>.

## C. Setting Up Your Communication Software

**Important:** Viking Electronics will NOT support computer software or hardware problems. If you experience these problems, research your hardware/software instruction manuals or contact the manufacturer's technical support department. Start your communication software. For example, "Terminal" is the communication software supplied with Windows 3.x and "Hyperterminal" is supplied with Windows 95. Configure a profile called "**CA-4**" as follows:

**Com** = that of your serial port (1 - 4)  
**Baud rate** = 9600

**Data bits** = 8  
**Stop bits** = 1

**Parity** = none  
**Flow control** = Xon/Xoff

Parity check and carrier detect should be left unselected. Save your settings. This will allow you to retrieve your settings whenever you wish to download **CA-4** data without having to manually set the parameters each time.

## D. Setting Up Your Printer

**Important:** Viking Electronics will NOT support printer problems. If you experience these problems, research your hardware/software instruction manuals or contact the manufacturer's technical support department.

Configure the serial printer as follows:

**Baud rate** = 9600  
**Data bits** = 8

**Stop bits** = 1  
**Parity** = none

**Flow Control** = Xon/Xoff

# Operation

The **CA-4** monitors the voltage between Tip and Ring to determine if the line is in use. If the voltage is below 18V DC, the line is deemed in use and the **CA-4** notes the time and date of the call. At this point the call timer is started. While the line is in use, if any Touch Tones are detected, they are buffered, up to a maximum of 20 digits. When the call is complete, (minimum 5 sec.) the call timer is saved and all the call data is stored in the call buffer.

In the Buffer mode, call records are held in the **CA-4** for later retrieval. In the Dump mode, all stored call data is output to the serial port. As long as the **CA-4** is in the dump mode, subsequent call records are output as soon as the calls are terminated. Output of the **CA-4** can be controlled either manually by using the **DATA** button on the front panel or by entering <Ctrl> characters when interfaced with the serial communication software of a PC. Following are the <Ctrl> characters and their operations:

<Ctrl+X> = Statistics reset

<Ctrl+Z> = Send date, time & mode

<Ctrl+B> = Buffer mode

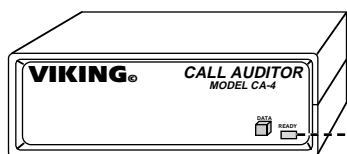
<Ctrl+D> = Dump mode

<Ctrl+S> = Start/Stop (toggle)

<Ctrl+H> = Halt and return to start

<Ctrl+A> = ASCII Delimited format

<Ctrl+T> = Tabular format



Ready LED

Flash Length	# of Flashes	Mode/Format
Long	1	Buffer Mode/Tabular Format
Long	2	Buffer Mode/ASCII Format
Short	1	Dump Mode/Tabular Format
Short	2	Dump Mode/ASCII Format

## A. Data Output Modes

### 1. Buffer Mode

In the "Buffer" mode, the **CA-4** will store up to 1820 call records. If the maximum buffer capability is surpassed, the oldest call records will be purged.

- Manual Operation** - To change the output mode, momentarily press the **DATA** button. The **CA-4** will toggle between modes. The "Buffer" mode is indicated by a slow flash (1 second on, 1 second off).
- PC Operation** - To enable the "Buffer" mode, enter <Ctrl+B>.

### 2. Dump Mode

In the "Dump" mode, all buffered data is downloaded to the RS-232 port. If left in the dump mode, each additional new call will also be downloaded.

- Manual Operation** - To change the output mode, momentarily press the **DATA** button. The **CA-4** toggles between modes. The "Dump" mode is indicated by a fast flash (1/2 second on, 1/2 second off).
- PC Operation** - To enable the "Dump" mode, enter <Ctrl+D>.

### 3. Deleting Data

To delete all stored data, press <Ctrl+X> (PC mode only).

## B. Data Format

### 1. Tabular Format

In the tabular format, the data is spaced to form a table. This is best for downloading to a serial printer.

**a. Manual Operation** - To change the data format, hold in the **DATA** button. After one second, the **CA-4** will begin flashing the LED, first consecutive five single flashes, then five double flashes and then repeating the pattern as long as the button is held in. Continue to hold the button down while watching the flashing LED. Release the **DATA** button when the LED produces a single flash to put the **CA-4** in the tabular mode.

**b. PC Operation** - To enable the "Tabular Format" mode, press <Ctrl+T>.

### 2. ASCII Delimited Text Format

In the ASCII delimited text format, a text file is produced with commas delimiting the individual data fields. This is best for downloading to a PC.

**a. Manual Operation** - To change the data format, press and hold the **DATA** button. After one second, the **CA-4** will begin flashing the LED, first five single flashes, then five double flashes and then repeating the pattern as long as the button is held in. Continue to hold the button down while watching the flashing LED. Release the **DATA** button when the LED produces a double flash to put the **CA-4** in the ASCII delimited mode.

**b. PC Operation** - To enable the "ASCII Delimited" mode, press <Ctrl+A>. **Note:** While in the ASCII Delimited Mode, no screen prompts will be returned from <Ctrl> commands.

## C. Printer Mode

Connect your serial printer to the RS-232 port of the **CA-4** and set up your printer as shown in "Programming section D." For ease of viewing, the Tabular mode should be used (see **B. Data Format, 1. Tabular Format**)

You may download records individually using the dump mode or store the records and dump all of the records at once using the buffer mode. Below is a sample printout/terminal screen.

month/day/year	time	line #	number dialed	call length	inbound (I) or outbound (O)
09/30/1998	12:41	4	5551212	00:00:09	O

## D. PC Mode

**Note:** Communication software menu commands may vary with brands and versions. The commands listed are only the most common. If your software does not use these menu commands, use the commands that most closely correspond.

1. Connect your PC to the RS-232 port of the **CA-4**.
2. From the personal computer, start the communication software and, open the profile as explained in **Programming section C. Setting Up Your Communications Software**.
3. From your communication software select "Transfer..." or "Transfer File...", then "Receive text..." or "Capture text..."
4. In the file name box, create a name with a .txt extension (Example: data.txt). Click "OK" or "Start." Your PC is now ready to receive the call data from the **CA-4**.
5. Enter <Ctrl+Z>. The **CA-4** will respond with time, date and mode, verifying communications between your PC and the **CA-4**.
6. Enter <Ctrl+D> to begin dumping the data. The call records will appear in the terminal window of your PC.  
**Notes:** You may momentarily pause and restart the data transfer by entering <Ctrl+S>. Alternatively, you may also abort and restart the transfer from the beginning by pressing <Ctrl+H> followed by <Ctrl+D>.
7. When the file transfer is complete, click on "Stop" or "Stop Transfer" button.
8. If desired, enter <Ctrl+B> on the PC keyboard to put the **CA-4** back into the call "Buffer" mode.

To use the data in a spread sheet, import the ASCII Delimited Text file you have just created and manipulate the data as necessary.

## E. Modem Mode

You may download the **CA-4**'s data remotely using a modem, a null modem adapter and telephone line. Connect the modem with the null modem adapter (Radio Shack # 26-1496 or 26-264 or equivalent ) to the RS-232 port. When you configure your communications software (see **Programming section C**), enter the phone number attached to the null modem.

**Product Support Line...(715) 386-8666**

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