CesCom

N400
ACA Approved

CE-0067 Datasafe

DATA COMMUNICATIONS LOGGER

DESCRIPTION

Designed as a replacement for RS-232 logging printers the CE-0067 features removable SD flash memory card technology that is able to store data indefintely. Current memory capacities for these cards commonly range from 128MB to 2GB which is the equivalent without compression of up to 52 million lines of text based on an average of 40 characters per line.

Memory cards may be exchanged at any time and can be read on any standard card reader that is available for connection to PCs etc via USB. Full operator access is provided via the USB port permitting concurrent operation with data-logging.

FEATURES

- Removable SD Flash card
- FAT16 8.3 format – PC compatible
- Programmable RS-232 port
- Internal buffering and handshaking
- Built-in time stamp (supercap backed)
- In-circuit programmable firmware
- Flash parameter store
- Power requirements: 8 – 25 V DC @ 100ma
- Status LEDs
- DB9M RS-232 connector with CTS+RTS
- 102mm x 80mm x 25mm

STANDARD APPLICATIONS

- Logging RS-232 traffic
- Journal printer replacement

OPTIONS

- PLC style input & ouput module
- VGA output + PS/2 keyboard + audio

OPERATION

In normal operation the unit will be receiving characters at 9600 baud and writing to the SD card at the end of each line. Every time the unit is powered up or the card is re-inserted a new log file will be created. The log file bears a name in the following format **LOG-0002.TXT** where the 0002 is a unique number (actually it is the starting cluster of the file in hex). Initially the size of the new file is set at 512 bytes comprised of null characters. As data is added to the card the file size is updated at the start of each new sector of 512 bytes. This system makes it compatible as a text file with the advantage of being able to remove the card without any further user intervention. To prevent the text file from becoming too large to handle by external viewers etc the file size is capped at 256KB at which time a new log file is created automatically.

If the card inserted is not formatted in FAT16 format then the logger will perform an auto-format and restart. Once the logger is ready the RTS will be asserted to indicate that the logger is ready to receive data. Characters are buffered as they are received so even if the logger is not ready or it is busy writing to the card etc, no data will be lost in normal operation.

SD FLASH

During operation the SD card may be removed at any time without any adverse effects. Normally, on most systems, the FAT tables and directory entries need to be updated as information is added. However with the incremental write operation that occurs with datalogging operations this would become a problem with SD Flash technology as there is a maximum number of write/erase cycles (wear) that can be performed on any Flash device. This is overcome in this implementation while still maintaining FAT16 compatibility by assigning a fixed size file for the working log file.

By assigning a fixed size of 256K to this file and treating the file as one null terminated buffer it is possible to satisfy SD Flash wear limitations. Once the buffer fills up, or when the unit powers-up it is automatically backed-up into another file and the working file internally reset even though it still appears as a 256K file when inspected.

SD reading and writing is performed a sector at a time so no more than a sector sits in RAM at any one time. Once the sector buffer fills it is written to the Flash. The buffer is also written if it has received fresh data and no more activity has occurred within a 3 second timeout period.

SYSTEM LOG

In addition to the data log files there is a system log file that keeps track of system events. A sample of the file is shown below viewed in operator mode.

```
LIST FILE: SYSLOG .TXT 0/65,536

01/08/06 15:05:47
19/07/06,09:14:56,RESET
19/07/06,13:03:26,RESET
19/07/06,13:12:51,Backed-up log file
19/07/06,13:17:25,Backed-up log file
19/07/06,23:12:11,RESET
26/07/06,13:14:15,EDIT TIME
26/07/06,13:14:00,TIME SET
26/07/06,13:20:47,CARD INSERTED
26/07/06,13:20:48,RESET
01/08/06,14:02:48,CARD INSERTED
26/07/06,13:20:48,Backed-up log file
01/08/06,14:02:49,RESET
01/08/06,14:04:48,FORMATTED
01/08/06,14:04:48,RESET

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OPERATOR MODE

Access to the logger is via a Terminal program using the USB serial communications port. Connect a USB cable from the PC to the unit and if necessary load the Silabs CP210x driver supplied. Using a terminal program such as TeraTerm or Hyperterminal etc connect to the unit with the settings 115200,8,N,1. Hit the escape key to view the help menu.

HELP

```
CHUBB DataSafe MAIN MENU 01/08/06
15:11:51

[ESC] Help screen
[ENTER] List directory or list selected
file
[HOME] View selected log file from
beginning
[END] View last page of selected log
file
[PAGE UP] Page up in listing
[PAGE DOWN] Page down in listing
[LEFT] Scroll slower
[RIGHT] Scroll faster
[ View Previous file
] View Next file
[DEL] Scroll stop
---------------------------------------
b Backup LOG.TXT
f Format Card
t Set Time
d Set Date
I SD Card Information
1...5 Set page length to 10...50

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Viewing Commands

Enter . . . . . View directory
] . . . . . Next File
[. . . . . Previous FIle
+ . . . . . Scroll faster
- . . . . . Scroll slower
SP . . . . . Pause
\ . . . . . Scroll stop
1..5 . . . . . Set operator screen lines from 10 to 50
I . . . . . Display SD Card Information
t . . . . . Set time
d . . . . . Set date
b . . . . . Backup log file
f . . . . . Format card and preset files
? . . . . . Help
% . . . . . Enter firmware update mode

File browsing commands

Page Up . . . . View next page up
Page Down
Home
End
Del . . . . . Stop scrolling
Up
Down
Left . . . . . Scroll slower
Right . . . . . Scroll faster

Directory Commands

Enter. . . . View FIle
R. . . . . Rename File
b . . . . . Backup log file
? . . . . . Help
Home . . . Select first directory entry
End. . . . . Select last directory entry
Up. . . . . Previous directory entry
Down . . . Next directory entry

```
DataSafe Directory 01/08/06 15:47:26

VOL: SDCARD FILE
SYSLOG .TXT ..a..... 65,536 01/01/2000
00:00:00
LOG .TXT ..a..... 16,384 01/01/2000
00:00:00

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```

HARDWARE

Indicators	
STATUS	Steady 1 second flash
DATA	Indicates coms data activity in the last 3 seconds
READY	
SDCARD	Flashes when accessing the SD Card
ALARM	
RS-232	
RTS	**CONDITION**
Low	Logger not ready or card removed
High	(asserted) Logger ready to receive data