

EXHIBIT E
SYSTEM MANUAL

FCC 10: XXX-CRT03B

Central Monitoring System

(Model No.: CRT-CMS03)

Operation Manual, Ver. 0.0

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FCC NOTICE

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if installed and used in accordance with the instruction, may cause no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the computer and receiver.
- Connect the computer into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

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Part 1. List of Components

The following items are standard package you should have in the box. Please check and be sure they are in good condition. Notify the dealer immediately if any is missing or damaged.

Item	Name	Quantity
1	Receiver	1
2	9 V DC power adapter, 200 mA	2
3	9-pin RS-232 serial cable	1
4	User manual	1
5	Software/Program, 3 1/2" Disk	1
6	Program manual	1
7	Transmitter	xxx, as ordered

NOTE:

There is NO user serviceable parts inside the Receiver and Transmitter. Contact your dealer for technical support. It is highly recommended to use the supplied RS-232 cable and the 9 V DC power adapters. However, standard 9-pin RS-232 cable can be used to replace the supplied cable. Other similar power adapters may be used provided the supplied voltage is in the range of 9-14 volts at 200 mA or higher current. Power adapters need to be UL listed and Class 2 Certified as well.

Part 2. Introduction

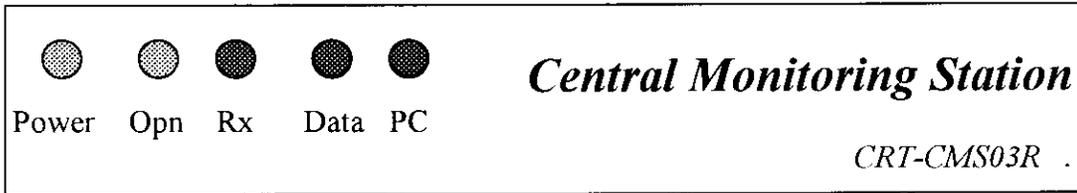
The Central Monitoring System (CMS for short) consists of three main parts: transmitter, receiver, and a host personal computer (PC) with application software. A complete CMS station may host up to 30 units of transmitters. Each transmitter measures temperature at a designated location, and detects discrete events such as temperature over-range, power supply condition, and switch open/close. The results are displayed, and transmitted to the receiver via RF.

The receiver is connected to a host PC via serial port. It receives RF signals sent from transmitters, decodes the signals, and forward the processed data to the host PC. The PC will process the received data along with other discrete events and present them to users in various formats. The same information is also stored in a corresponding database.

Both the transmitter and receiver have battery-backed-up operation with rechargeable batteries. This will permit an uninterrupted data recording for at least 24 hours in the case of power failure. The receiver has its internal permanent data storage for use when data can not be sent to host computer.

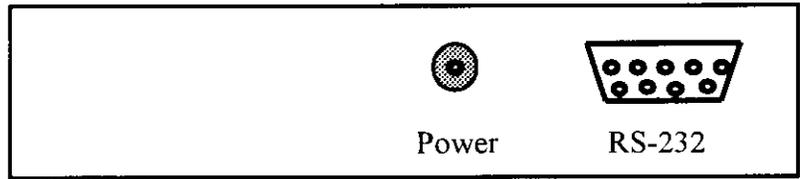
Part 3. Receiver (CRT-CMS03R)

Receiver front panel



- Power** Main Power indicator. A green LED indicating if the line power is ON.
- Opn** Operation status indicator. A green LED indicating receiver operation status. The LED flashes about once per second under normal condition, but it gives a shorter ON time flash when the main power is OFF.
- Rx** Data transmission indicator. A flashing red LED indicating the data receiving activity on the serial port.
- Data** Data storage indicator. A red LED indicating the availability of data in the receiver. There is data stored within the receiver if the LED is ON.
- PC** Communication link indicator. A red LED indicating the status of the communication with the host PC. If there is no serial communication within 20 seconds, the LED flashes to indicate the communication may be broken.

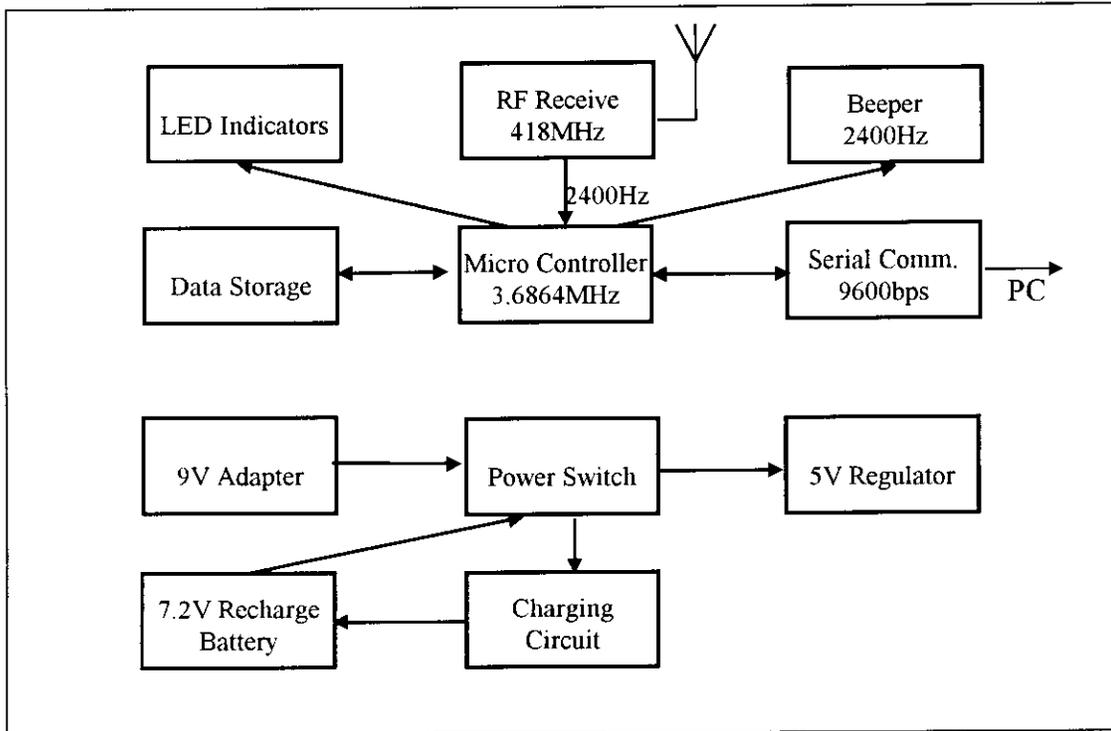
Receiver back panel



Power and power switch

Power switch is a slide switch on the left side of the receiver. The receiver is powered by a 9-volt AC adapter with center as positive lead.

Block diagram



Battery operation

The receiver has a rechargeable battery pack for backed up operation. When the main power is on the battery is charged to full. When the main power is off, the receiver will operate on the battery for at least 24 hours. The battery-backed operation has the following features:

- The main power LED is off.
- The operation LED flashes with a shorter on time to indicate that receiver works on battery.
- All other LEDs are off to minimize power consumption
- There is no communication with the host computer. The receiver assumes the host computer lost power as well.
- All received data are stored internally in the receiver’s memory. The data will be loaded to the host computer after the main power and serial communication are recovered.

Installation

- Connect the receiver to a host PC with the serial cable

- Plug the power adapter to the power socket of the receiver, located at the back panel . Plug the adapter to a 110 V AC outlet.
- Switch on the receiver. The green power LED should be ON, and the operation LED should flash once per second.

Part 4. Host Computer

PC requirement

An IBM compatible PC can serve as a host computer for the CMS-03 system with the following minimum requirement:

- Processor: 386 or higher with math processor
- Windows: 3.1x or higher
- RAM space: 8M or more
- Disk space: 4M
- One communication port (RS 232)
- Printer – optional.

Install the CMS software

The CMS software is contained on a 1.2” floppy. To install the software

- Power on the host computer, and run under windows
- Insert the disk to the floppy drive of the host computer
- From the “File” menu, select “run”
- Type in “a:setup” in the run window, and hit return.
- Follow the setup instructions as the installation process proceeds

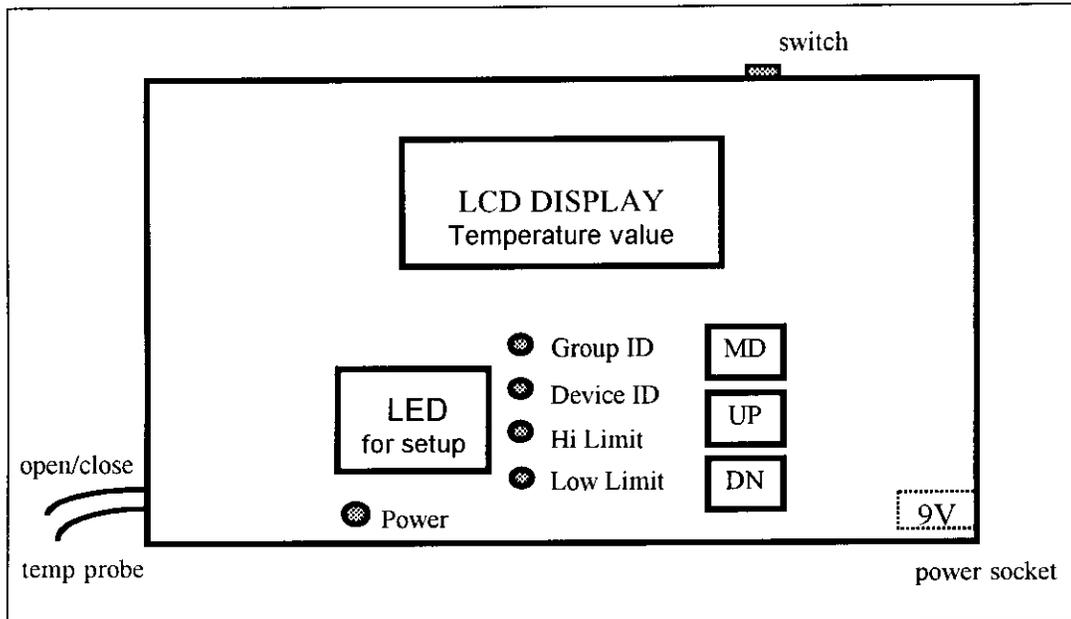
Start CMS Program

After the installation is complete, a user can start the program by double click on the CMS program icon. If the program is run the first time, it will automatically start in configuration mode. Please refer to software manual for details.

Part 5. Transmitter

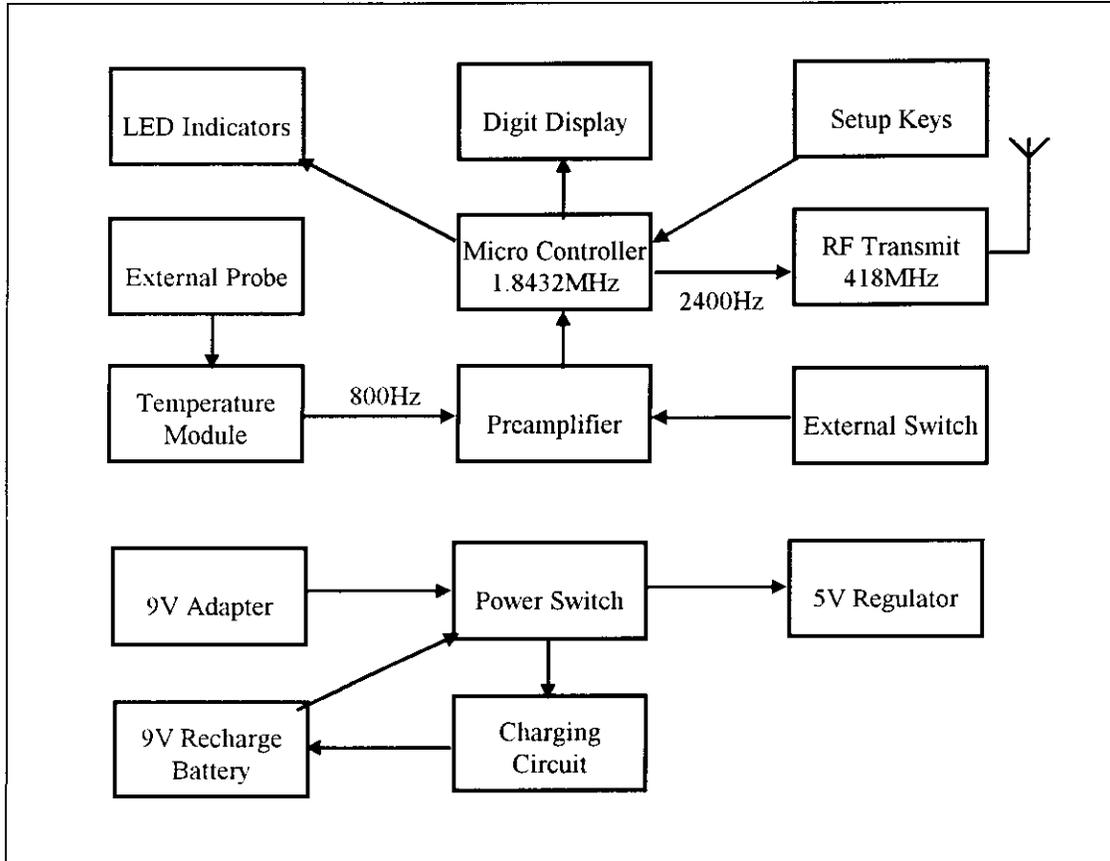
Front panel

A transmitter unit consists of temperature display, temperature probe, open/close input, set up display, and set up keys.



- Temperature display: An LCD display panel with temperature value shown in Centigrade.
- Temperature probe: An attached cable with a thermal sensor at its tip.
- Open/close input: An attached cable with two wires to be connected to a switch-like device.
- Setup display: An LED digital display showing setup parameters, and four red LED indicators showing setup mode
- Setup keys: Three pushbuttons for setting up the transmitter unit.
- Power indicator: A green LED indicator showing whether or not the unit is operating on line power.

Block diagram



Installation

Each transmitter unit needs to be setup before it is installed. There are four parameters: group ID, unit ID, low temperature limit, and high temperature limit. Each system has a unique group ID which is used by its receiver to identify signals from the system. Each transmitter in a group should have the same group ID. Each transmitter of a group has a unique unit ID. The high and low temperature limits are used to send warning signal. Using the three keys (MODE, UP, and DN) in the front panel of the device, the transmitter should be setup in the following way:

Power up the transmitter

Connect the line power adapter to the transmitter, and switch on the unit. The green power indicator should be ON, and the temperature display will show temperature value.

To check unit condition/Test

Push the mode (MODE) button until the LED display shows the integer part of the temperature value and all mode LED indicators are OFF. Push the UP or DN button to transmit test data to the receiver.

To set up group ID

Push the mode (MD) button until the first LED indicator “Group ID” is ON. The LED display shows the current group ID. Push the up (UP) button or down (DN) button to increase or decrease the ID.

To set up unit ID

Push the MODE (MD) button until the second LED indicator “Unit ID” is ON. The LED display shows the current unit ID. Push the up (UP) button or the down (DN) button to increase or decrease the ID.

To set up high temperature limit

Push the mode (MD) button until the third LED indicator “Hi Temp” is ON. The LED display shows the current high temperature limit value. Push the up (UP) button or the down (DN) button to increase or decrease the value.

To setup low temperature limit

Push the mode (MD) button until the last LED indicator “Low Temp” is ON. The LED display shows the current low temperature limit value. Push the up (UP) button or the down (DN) button to increase or decrease the value.

To complete setup

Push the MD key to cycle through all the above setup conditions two or three times to make sure all the displayed values are correct.

Part 6. Specifications

	Receiver	Transmitter	Unit
Power Requirement	9	9	V DC
Power Consumption	<50	<30	mW
Temperature Range		-20 to +70 (0 to +160)	°C °F
Resolution	0.1	0.1	°C
Accuracy	±1	±1	°C
High/Low Limit Setting		±1	°C
RF Frequency	418	418	MHz
Dimensions (H x W x D)	3.5 x 5 x 1.5	1.5 x 6.75 x 4.75	in
Working Environment			
Temperature	10 – 40	10 – 40	°C
Humidity	30 - 70	30 - 70	%