RELCOM Inc.

MONITOR FOR WINDOWS

For use with Microsoft Windows 3.1, Win-95/98 or WinME

to control the Relcom CBM-1 Network Monitor

VERSION 2.02

INTRODUCTION

Thank you for purchasing this program for remote control of the CBM-1 Network Monitor. This program provides computer enhanced operation for the Network Monitor test instrument. The Monitor can be used as a stand-alone test instrument, but its utility can be enhanced by using it with a PC computer. This program is Windows based and reflects the front panel of the instrument with additional information shown relating to remote operation and the validity of readings

This program can be used to either connect a PC to the CBM-1 directly with a serial cable, or it can be used with modems to communicate over phone lines to allow remote operation of the Monitor with a local PC/modem combination.

This manual discusses the operation of the Windows program, installation of the program under Windows 3.1 or Win95, and includes a programmers guide detailing the RS-232 command/response set.

Connection to a PC requires a DB-9 Male connection to the Monitor. Cables and adapters are available from Relcom Inc. Please see the Appendix for a list of part numbers of accessories and options available with this program. To work with a Modem, the Monitor must have a Null Modem adapter attached between the Monitor and Modem.

Revision History

Version 1.00

For use with the following ROM and FLASH versions:
>   ROM Version 1.17 and FLASH Versions 1.19 and 1.20
>   ROM Version 1.18 and FLASH Version 1.21.

Version 2.00

ROM Version 1.19 and FLASH Version 1.24.

Version 2.01

ROM Version 1.19 and FLASH Version 1.24.

Version 2.02

ROM Version 1.19 and FLASH Version 1.25.

MONITOR for WINDOWS OPERATIONS MANUAL

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MINIMUM SYSTEM REQUIREMENTS

- Windows 3.1 or later, or Windows 95.
- 386SX or better processor
- 4 MB RAM
- 6 MB Hard disk space
- VGA display
- Unused serial port (9 pin or 25 pin). If an adapter and/or serial cable is required these may be ordered from Relcom. The 6 ft. 9 pin Serial cable is part # CBM-1A001, the 25 pin to 9 pin adapter is part # CBM-1A002.
- Optional for Modem Operation: Internal/External Hayes Compatible Modem to connect to PC, and a second external Hayes Compatible Modem to connect to the CBM-1 Network Monitor.
- A 9 pin Null Modem adapter, part number CBM-1A003

INSTALLATION of PROGRAM into WINDOWS 3.1

Please insure that no applications are running while performing the installation. If problems are encountered, you may want to also disable any screen savers that may be active.

- Insert Diskette #1 (SETUP) into the available 3.5" Floppy A or B drive.

- From within Windows, select Program Manager and File/RUN from the menu bar, and type SETUP.EXE with the appropriate floppy drive path (e.g. A:\SETUP.EXE).

INSTALLATION of PROGRAM into WINDOWS 95

Please insure that no applications are running while performing the installation. If problems are encountered, you may also want to disable any screen savers that may be active.

- Insert Diskette #1 (SETUP) into the available 3.5" Floppy A or B drive.

- From within Windows, select Start, Settings, Control Panel, Add/Remove Programs. Click on Install and follow the normal Windows installation procedure.

QUICK START DIRECTIONS

- Connecting to a PCConnect the Monitor to the network as described in the Monitor Operation Manual.

- Attach the Monitor to the PC as shown below with necessary adapters:
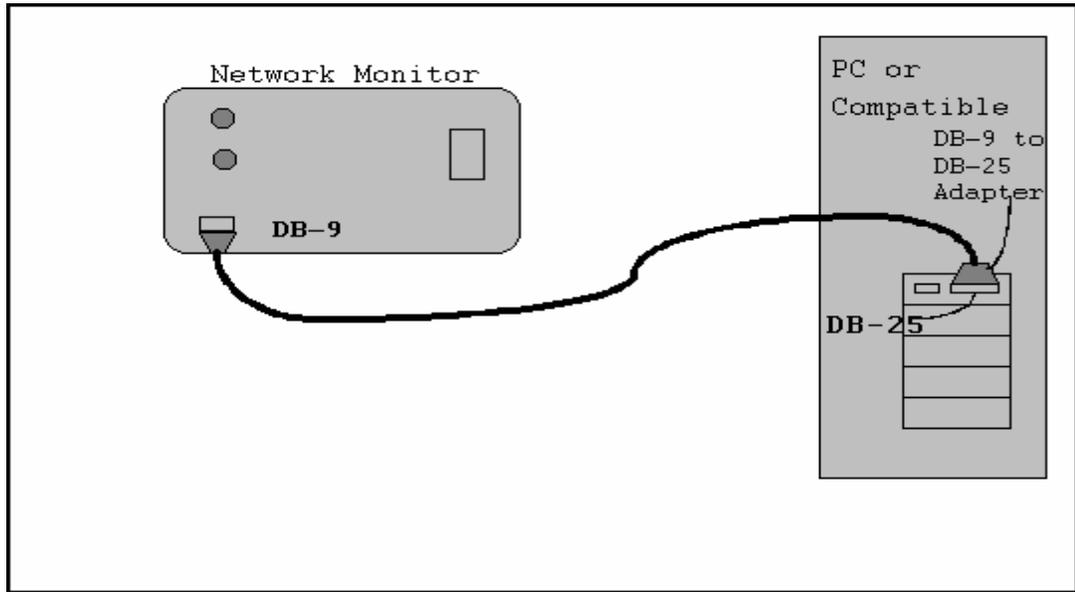
- Turn on the Monitor

Figure 1

Connecting to a Modem

- Connect the Monitor to the network as described in the Monitor Operation Manual.

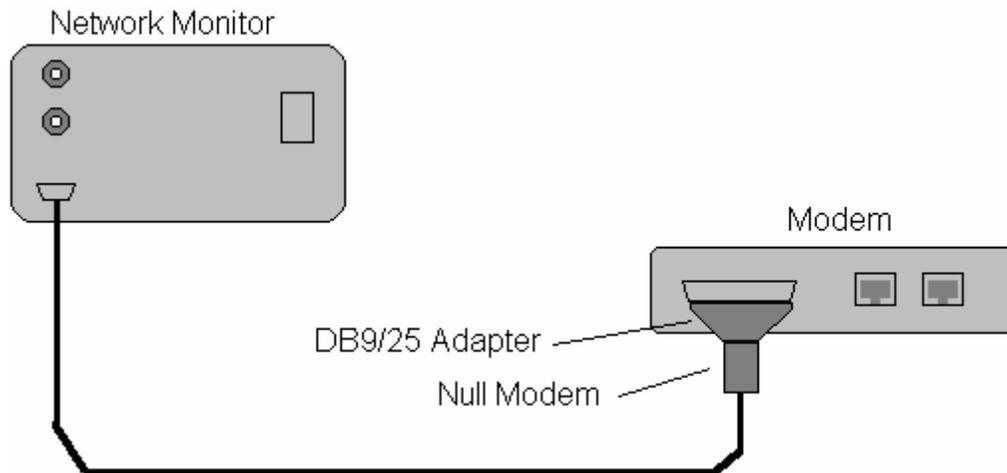- Attach the Monitor to the Modem as shown below:

Figure 2

PRELIMINARY.

The Monitor is shipped default to cause the modem to answer after the first ring. This setting may be changed either by the front panel, or through this software program. Please see the Modem Operations Section.Running the MON4WIN Program

The installation program should have created a program group and a program icon for the MON4WIN program. Click on this icon to start the program.

Configuration of the MON4WIN Program

The Program defaults to COM1, 9600 Baud. This is the maximum rate at which the Monitor can communicate over the RS-232, and is its default value. If these default values need to be changed, use the CommPort Menu item to do so (see figure 3 below).

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- Select the CommPort item on the menu bar, then the Port item to select the correct communications port to be used.

If the computer requires a slower data rate, this can be changed through the same menu by selecting Baud instead of Port to select the desired Baud rate. See Figure 4 below:

Direct Connect Operation

When connected to the Monitor directly, information will be displayed about the Monitor attempting to initialize a Modem. Any time an RS-232 cable is connected between a device and the Monitor, it will attempt to determine whether a Modem is connected, and to set up the Modem to auto-answer on the selected number of rings. When the MON4WIN program is displayed, clicking on the Continuous Operations ON/OFF button will start up the RS-232 communications link. This will establish communications with the Monitor and show the current state of the Monitor. All the normal Monitor front panel buttons can be selected. The Monitor will react as though you had pressed that button on the front panel, with the exception of the ON/OFF which only disables continuous operation.

Once data has been acquired, clicking on the Channel Report button will enable a data box with a complete list of information acquired on the currently selected channel. The EDIT items on the menu bar allow copying the information to the Windows Clipboard and transferring the data to other applications. Pasting the data into Notepad will allow printing of the data on standard printers.

By using the A/B switch, data can also be acquired on the other channel for saving or printing.

WINDOW DESCRIPTION & CONTROL OPERATIONS

Windows Panel Control Description

Once the program has started, the control panel will be as shown in the following figure. A description of each button and its function follows the diagram.

Indicators & Gauges

Transmit/Receive Indicators

The Transmit and Receive indicators show when data is sent or received over the RS-232 interface. This is useful to insure that end-to-end communication is working. Sometimes there is little to no change in the display to convey this information. The indicators are multicolored (two colors for Transmit, three colors for Receive) so transient communications can be better seen. The reason for tri-color on receive is that it wasn't always possible to see the change since one message is so short. There is no particular meaning to any of the colors, other than to show something has been sent, or received.

Battery Gauge

The Battery Gauge shows the current condition of the battery. When plugged into an AC power source, it will indicate BLUE in the Charging region of the scale. When running on battery, the color will change to green from full to ½ scale, yellow at ¼ scale, and will turn red when empty.

Display

The display shows what is currently on the Monitor's display. The exceptions to this is that there is no spinning icon/bar to indicate activity on the network segment being examined. Nor is the system noise bar graph displayed.
At other times, the display may show other information related to the program, Modem operation, or other data depending upon what the user has requested of the program.

Current/Stale Indicators

There are CURRENT/STALE indicators below the Receive indicator on the front panel. CURRENT is green to indicate that the data received is more recent than the last data sent from the Monitor. STALE is red and means that the Monitor has no current data and the Monitor will continue to send it's last measurement until a new measurement has completed. This data is stale, or old data. When new data is received, the indicator will again change to CURRENT or a green color.

Front Panel Emulation

All the Monitor buttons can be selected by using a mouse or the TAB/Shift TAB key sequences. The Monitor will react as though you had pressed that button on the front panel as described in the Monitor Operations Manual.

Button Operation Descriptions

ON/OFF Control

The ON/OFF button above does not turn the Monitor on or off, it just controls the communications interface - whether or not the RS-232 is in continuous operation. The indicator next to the ON/OFF button shows it's current state. It is green when in continuous operation and is black when idle.

Channel Report Utility

This control displays a scroll box window with a data report for the current channel shown. This function prints out the current date and time followed with a summary of the currently selected channel showing all information from the acquired stations. To get a complete listing of a dual redundant system, you will need to change channels and get a second listing for the other channel. Only the currently selected channel data is shown on the output. The data in the box may be accessed with the EDIT menu items for selecting, cutting and pasting through the windows clipboard. Below is an example of this output screen. When any other button is pressed or accessed, or if you click anywhere on the grey of the main form, the data box is removed from the window.

The data shown includes the current channel, system noise average, and the system peak noise seen during this measurement period (since last re-acquiring stations on this channel). This is followed with a table showing the station number, its address (according to the address decoding selected), signal level average, signal level minimum, reflection average and reflection maximum. Note that the reflection values are all values, not clipped to values above 0 dBmV as shown on the Monitor display. This gives more data on reflections below the threshold than can be seen from the front panel of the Monitor. Changes in these levels can be indicative of changes in the system before they rise to a level of concern for the system.

Command/Input Data Control

The Command button allows access to the programming commands of the monitor. It provides a quick way to access any state/display screen available without having to push the various front panel buttons as you would have to do in normal operation of the Monitor. This drop down box will not accept a keyboard command at the present time, but all the available commands are included in the scroll box. The command is shown on the left, and the action of that command is shown to its right. The last command selected will be remembered. When a command has been selected by clicking on it, that command is sent to the Monitor over the communications link. This is a useful tool to get to a particular state without having to press numerous front panel buttons, or to investigate how the device reacts to commands if the user decides to create his own control program.

Additional items that have been added for Modem operation include: Modem Initialization String, Phone Number to Dial, Modem Timeout, and buttons to Dial Phone Number, and Disconnect/Hang-up Modem. These additional items in the CommPort Menu are also saved into the initalization file when saving the settings, and will be recalled when the program is restarted.

MONITOR for WINDOWS OPERATIONS MANUAL

The program checks to see which COM ports can be accessed, then only displays those that are valid. Once your selections are made and you have established communications with the Monitor, you may want to save those settings. If you use the Save Settings menu item, these settings will be remembered and restored the next time the program is started.

- Turn on the Monitor but leave the Modem **OFF.**

- Press the SET key on the Monitor, the press the SEL keys till the EXTENDED menu is displayed. Select RS-232 then press the SET key. Select MODEM and press the SET key. Change the Number of Rings to a value greater than zero to allow the Modem to answer the call. A value of ZERO will prohibit the Modem from answering at all. This allows the user to select say 10 rings to allow normal use of a telephone, but if unanswered after 9 rings, the Modem will then answer on the 10th ring. This setting will be stored in NonVolatile memory to be available next time the Monitor is powered up.

- To exit these menus, press SET again, select EXIT and press SET to return to the Extended Menu. Then select a Mode switch, then SET again to return to normal operation.

- You may now power-up the Modem.

The Modem Timeout value is limited to values from 1 to 65 seconds. If the program detects and displays normal messages, of completion, this will terminate the timer, wait for a second, and also put the information into the Monitor Display Window when completed. If no valid information is detected, the timer will timeout and return control to the Monitor panel.

PRELIMINARY.

Dial Phone Number

When this control is pressed, the following form appears. It can show the progress of the communications with the Modem.

The example above shows the response when the modem is not connected to a live telephone line.

HangUp/Disconnect

When this control is pressed the following actions take place.

1. The Continuous operation is placed in OFF or Idle
2. The program waits for 3 seconds to allow time for the modem to send any data it may have in process.
3. The program sends a "+++" to the modem to put it into command mode.
4. A wait of 1 second for the acceptance of above command.
5. The program sends "AT H" to the modem to cause it to hang-up.
6. Another 1 second wait for this action to be performed.
7. The following screen is then shown indicating that the above actions have taken place:

PROGRAMMING GUIDE TO RS-232 COMMANDS/RESPONSES

RS-232 Command Set:

The following commands are available over the RS-232 Interface. The command and a description of it's action is listed. There are three sections to the list. The first is the front panel emulation command set, the second is a state command set (short cuts to a particular mode) and the third are utility commands that give additional capability to the user not readily available from the front panel. NOTE: All the commands in the first two sections below have battery/charging status information at the end of the message. The four states which return measurement data (AS, SA, IS and INS) also return a current data flag that is 1 for current data and 0 for stale data. These are described in the response section.

Front Panel Emulation Commands:

A/B

Command emulates pushing front panel A/B switch. Causes an output. Generally does not change mode of operation - does NOT operate when in settings modes.

SET

Changes mode of operation to/from settings modes. Also used to step into menu items within the settings environment.

MU

Emulates the front panel Mode UP button.

MD

Emulates the front panel Mode DOWN button

SU

Emulates the front panel Select UP button.

SD

Emulates the front panel Select DOWN button

State Commands:

INI

Initialization State - shows battery condition, ROM and FLASH revision levels and instructions for continuing on, or clearing memory to re-acquire data (fresh start).

AS

All Station Mode - attempts to go to the all station mode. If there are no stations acquired it automatically resets and attempts to re-acquire a station list. Otherwise it returns the number of active stations, total number of stations, channel in use, station # with lowest (min) signal level, the station # with highest measured reflection, and the average and peak system noise levels.

IS

Individual Station Mode - lists the station number, address, average signal, minimum signal, reflection average, reflection peak data.

INS

Inactive Station Mode - returns the message "No inactive stations" or the first station in the station list that is inactive. Select up and select down will scroll through the inactive stations with wrap at the ends. The data returned is similar to the IS response above.

IH

Inactive History Mode - returns the message "No inactive history" or the first station in the station list that has gone inactive sometime during the current acquisition. This list scrolls through the station list but does NOT wrap at the ends. This list outputs the internal station number, the address and how many times the station has been removed from the token ring.

BK

Backlight control mode - allows turning the backlight on/off with either the SU or SD commands. Returns the current state of the backlight, 1 = on, 0 = off.

CNTR

Contrast control mode - allows setting the LCD contrast, or checking its current

setting. The SU and SD commands change the level. The unit returns the current setting (0-7 value).

SIG

Signal Output command - selects which signal is output through the rear panel of the Monitor, either LOG amp output or INPUT signal out. Returns the current setting.

MNU

Menu for Time-out, Address or RS-232 setting controls. Use the SET command to execute the selected setting. Use the SU/SD commands to change the selection. Use the MD/MU commands to exit this mode so SET can return to normal instrument operation.

TIM

Time-out setting - allows changing the time-out value from 0.1 seconds to 25 seconds. Use the SU/SD commands to change the value. Returns the current setting.

ADR

Address decoding selection - allows changing the address decoding from 16 bit to 48 bit IEEE addresses, or the Short Decimal mode for Honeywell systems.

RS

RS232 Menu to select Baud Rate and Handshake options. Returns the current selected item. SU/SD changes selection, SET executes the selected item.

HS

Handshake selection - currently either NONE or XON/XOFF. SU/SD changes selection, SET exits this mode. MU/MD will move to the BAUD function.

BAU

Baud Rate Selection - allows changing the baud rate from 300 to 9600 baud using the SU/SD keys. **CAUTION: CHANGING THE BAUD RATE WILL DISRUPT THE COMMUNICATIONS LINK AS THE CHANGE OCCURS WHEN SELECTED.** This option is here to allow the end user to determine what baud rate the device is currently configured for.

MO

Modem number of rings selection – allows the user to set the number of rings the modem will take before going off-hook to answer the call. A value of ZERO disables modems from answering calls. The allowed range of values is from 0 through 255. Pushing the SEL buttons will increment or decrement the count. When this screen is exited, the value shown is stored into non-volatile memory to be recalled next time the Monitor is powered on. Also, upon exit from the screen, the Monitor will attempt to update any Modem that may be attached to the Monitor. This may cause a slight delay in response from the Monitor if other commands immediately follow the exiting of the Number of Rings screen.

Utility Commands:

DUMPCH

This command returns an ASCII formatted data stream that may be sent to a printer. It outputs all data for the currently selected channel with station numbers, station addresses, min/max/average measurements and the average and peak values of the system noise. This is a good tool for documenting the current state of the network. Comparing reports from previous acquisitions can help to locate problems and provide data for preventive maintenance to prevent network failures. NOTE: The Date/Time stamp shown in the MON4WIN program is generated from the local PC, not from within the Monitor. The original command name was chosen to describe the memory dump of the channel status over the RS-232 connection, not the loss of information.

RS-232 Responses:

The following descriptions show an example of each response, and a description of each field within that response. Where multiple responses within a field are possible, they are shown in the field description section, not as a section by itself.

AS,A,2 ,2 ,23 ,2 ,None ,1 ,-20 ,-20 ,1 ,Charging

AS = All Station Mode
A = Channel in use - Channels = A or B
2 = Number of Active Stations - up to 99 total
2 = Total Number of Stations - up to 99 total
23 = Minimum Signal Level found. This value can be from 0 to 60, normally it will range between 10 and 24.
2 = Station # with Min Signal
None = Reflections below threshold level. Otherwise the number may be from 0 to about 10. Values above 3-5 may be of concern. Values above 15 may indicate severe system noise.
1 = The station with the highest reflection level seen, even though the level may be below the threshold reporting level.
-20 = Average System Noise
-20 = Peak System Noise

1 = Current Reading - 0 = Stale Data. A current reading means that the data returned is newer than the data previously returned. Stale data means that the data returned is the same data as previously returned. This is a general idea in that new data has been acquired by the Monitor. In the case that there is no network activity, the user will see Stale Data when changing modes of operation, even though the information returned is not the same as previous (e.g. going through the station list in Individual Station mode).

Charging shows unit connected to AC & Battery is being charged.   Full, ¾, ½, ¼, Empty show state of battery charge when unit is NOT charging the battery. Even though it may be plugged in, a failure in the battery charging circuit will result in battery levels to be reported instead of the Charging message.

IS,A,1 , AC-84-AC-84-AC-84,24 ,24 ,None, ,1 ,Charging

IS = Individual Station Mode
A = channel in use
1 = Station number shown
AC-84-AC-84-AC-84 = Address of current station - Address in 16 bit mode would be AC-84, and address in Short address mode would be 43.
24 = average signal level of the selected station.
24 = minimum signal level of the selected station.
None = Reflections below threshold level.
blank = no max reflection seen, otherwise the peak reflection level is shown (0-10 typical range).
1 = Current Reading - 0 = Stale Data
Charging = Same as previously defined

INS,A,No inactive stations found, charging

INS, A, 2 , 21-5C-21-5C-21-5C,24 ,24 ,None, ,1 ,Charging

INS = Inactive Station Mode
A = channel in use
2 = Station number shown
21-5C-21-5C-21-5C = Address of current station
24 = Average signal level
24 = minimum signal level
None = Reflections below threshold level
blank = no max reflection seen
1 = Current reading, 0 = Stale Data
Charging = Same as previously defined

IH,A,No inactive history,Charging

IH, A,1 ,AC-84-AC-84-AC-84,1 ,Charging

IH = Inactive History Mode
A = Channel in use
AC-84-AC-84-AC-84 = Address of current station
1 = Number of times stations has gone inactive
Charging = Same as previously defined

SA, A, 21-5C-21-5C-21-5C,60 ,59 ,-20 ,-20 ,1 ,Charging

SA = Stand-alone Mode - This mode cannot be reached by any command, it must be reached through normal instrument acquisition from a re-acquire state (i.e. MU from All Station Mode, or SD from INItialized State).
A = channel in use
21-5C-21-5C-21-5C = Address of current station
60 = Average signal level
59 = minimum signal level
-20 = Average Noise Level (between packets)
-20 = Peak Noise Level
1 = Current reading, 0 = Stale Data
Charging = Same as previously defined

INI,V1.16,V1.19,Charging

INI = Initial State
V1.16 = ROM version of firmware
V1.19 = FLASH version of firmware
Charging = Same as previously defined

BK,0,Charging

BK = Backlight setting mode
0= backlight off, 1 = backlight on
Charging = Same as previously defined

CNTR,4,Charging

CNTR = Contrast setting mode
4= current setting - range is from 0 to 7
Charging = Same as previously defined

SIG,LOG,Charging

SIG = Signal output selection mode
LOG = log output, INPUT = input signal output
Charging = Same as previously defined

MNU,TIMEOUT,Charging

MNU,ADDRESS,Charging

MNU,RS232,Charging

MNU = Menu of TIMEOUT, ADDRESS, or RS232 Menu selections
TIMEOUT = Time-out selected, ADDRESS = Address selected, RS232 = RS232 selected
Charging = Same as previously defined

TIM,1.0 ,Charging

    TIM = Time-out setting mode
    1.0= Current time-out setting - range is 0.1 to 25 Seconds
    Charging = Same as previously defined

ADR,48 BIT,Charging

    ADR = Address selection mode
    48 BIT = Normal 48 Bit IEEE address decoding
    16 BIT = Normal 16 bit IEEE address decoding
    SHORT = Special 48 bit addressing mode for Honeywell Systems
    Charging = Same as previously defined

RS,BAUD_RATE,Charging

RS,HANDSHAKE,Charging

RS,MODEM = NONE,Charging

RS,EXIT,Charging

    RS = RS232 Menu of BAUD RATE, HANDSHAKE, or MODEM Menu selections.
    BAUD_RATE = BAUD RATE selected, HANDSHAKE = HANDSHAKING selected,
    Modem = ON/FAIL/NONE
        ON means modem has been found and initialized.
        FAIL means something answered an AT command but did not accept the
        initialization string.
        NONE means that no modem was found. This should be the case with a
        terminal attached to the Monitor.
    EXIT = EXIT selected
    Charging = Same as previously defined

BAU,9600,Charging

    Bau = Baud rate selection mode
    9600 = Baud rate selected - values are 300, 600, 1200, 2400, 4800 and 9600 Baud
    Charging = Same as previously defined

HS,NONE,Charging

HS,XON/XOFF,Charging

    HS = Handshake selection mode
    NONE = no handshake selected
    XON/XOFF = Software Handshake Selected
    Charging = Same as previously defined

MO,2 ,Charging

MO = Modem Setting Number of Rings
2 = Number of rings to set the modem answer function to. Zero(0) means do not answer. Valid range is from 0 to 255.
Charging = Same as previously defined.

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APPENDIX

OPTIONS:

PC Monitor Software	CBM-1S01	Software for operation the Monitor from a local or remote PC.
RS-232 cable	CBM-1A001	1.5 m (5 ft.) cable with 9-pin connectors on both ends.
25-pin to 9-pin adapter.	CBM-1A002	DB25 female to DB9 male.
9-pin Null Modem adapter	CBM-1A003	9-pin F emale to 9-pin Male Null Modem adapter – for use with modems.

CBM-1 Network Monitor

Addendum to MON4WIN
Version 1.0 Software

This software version was originally written for ROM Version 1.18, and FLASH Version 1.21.

The current released ROM Version is 1.19, and FLASH Version 1.25. This implemented both a multitasking operating system to improve performance and response time, and added the ability to communicate with Modems.

Due to the changes in firmware, and additional information being available from the Network Monitor, there are some compatibility problems with this version of software. This is in the area of the RS-232 menu system which will no longer work correctly with the instrument. Please do not access the RS-232 menu or it's items as the program may get lost. When an updated program becomes available, it will be shipped to you, free of charge.

The documentation in this package also does not yet list the additional commands and responses of the Network Monitor that have been added for modem control.

When first connecting the RS-232 interface to a terminal/PC, you will see some modem initialization characters as the Monitor attempts to detect the presence of a modem. This takes about five (5) seconds to complete at which time normal communications may commence with the Monitor.

If you have any problems not described above, please contact Steve Coan at Relcom, Inc.
Phone: (503)-357-5607, FAX: (503) 357-0491, or via e-mail at
<stephenc@relcominc.com>.

Thank you for your understanding and patience during this transition period of time.

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PRELIMINARY.