

OWNER'S MANUAL

V93 DAC: 14.4k bps HOST
COMMUNICATION MODEM
MODULE FOR BAYTECH
M SERIES DAC MODELS

BayTech Manual Publication #U140E116-01

FCC REQUIREMENTS FOR THE V93 HOST COMMUNICATION MODEM MODULE

1. The Federal Communications Commission (FCC) has established rules which permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment should not be used on party lines or coin lines.
2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.
3. The telephone company may make changes in its technical operations and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes. You will be advised of your right to file a complaint with the FCC.
4. If the telephone company requests information on what equipment is connected to their lines, inform them of:
 - a. The telephone number this unit is connected to
 - b. The ringer equivalence number
 - c. The USOC jack required: RJ-11
 - d. The FCC Registration Number

Items 'b' and 'd' are indicated on the label.

The ringer equivalence number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the RENs of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

In the event of equipment malfunction, all repairs should be performed by our Company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our Company or to one of our authorized agents. Service can be obtained at:

Bay Technical Associates, Inc.
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Bay Saint Louis, Mississippi 39520 U.S.A.
Phone: 601/467-8231 or 800/523-2702
Fax: 601-467-4551

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1 GENERAL INFORMATION

The V93 Host Communication Modem Module is the remote user interface to the BayTech M Series DAC (Data Acquisition and Control) units. This module features a V.32bis/V.42bis internal modem and allows a remote host terminal to connect and issue specific configuration or data commands to the various I/O modules or the M Series unit main board. Multiple V93 modules can be installed in an M Series chassis allowing certain I/O module types to send data to specific V93 modules. Up to seven V93 modules can be installed in the M8 DAC and up to fifteen in the M16 DAC. Please see the M Series main unit documentation for more information on the available types of I/O modules.

IMPORTANT: The first module slot of the M16 DAC or M8 DAC with LCD must be occupied by a V71 host module, V93 host modem module, or V89 cascade module.

Programmable features include the port select code, password, and inactivity timeout enable/disable.

2 SPECIFICATIONS

INTERFACE: Dial-up telephone line

MODULATION: V.32bis (14,400 bps) or V.32 (9600 bps)

COMPRESSION: V.42bis, MNP5

CONNECTORS: 2 x 4-pin modular

MODULE LEADS: *TD* (Transmit Data), *RD* (Receive Data),
CD (Carrier Detect), *MR* (Modem Ready), and *CX* (Connection)
status LEDs.

TRANSMIT LEVEL: -10 dBm (dial-up)

RECEIVER SENSITIVITY: -45 dBm

DIMENSIONS: 6"h x 4.5"w.

FACTORY POWER-UP DEFAULT CONFIGURATIONS:

Port Select Code: \$BT

Password: BTA, disabled

Inactivity Timeout: enabled

USER-PROGRAMMABLE CONFIGURATIONS:

Easy to configure using on-screen menu. Choices are saved in non-volatile memory to become the new power-up default configuration.

Port Select Code and Password: Any ASCII character string up to 8 characters. Password can be enabled or disabled.

Inactivity Timeout: Enabled or disabled.

3 CABLING

The V93 modem has two modular connectors for connection to a dial-up line and the *DIAL* service modem port if using the Ring Detect Reset feature (see *Section 4.2.3*). Either port can be used for connection to a dial-up line or the service modem port. The connection between the V93 and the service modem port is optional. The V93 modem interfaces to a dial-up line and the service modem port using a straight 2-wire or 4-wire cable. If using a 2-wire cable, the middle two pins should be utilized.

4 OPERATION

Section 4.1 discusses user-programmable operations and *Section 4.2* discusses basic V93 operation.

4.1 USER-PROGRAMMABLE FEATURES

User-programmable features for the V93 include the Port Select Code, Password, and Inactivity Timeout Enable/Disable. These features are programmed by accessing the menu-driven configuration mode from the V93 or service port (see *Section 5*). If the default parameters shown in bold print are not satisfactory for your application, you must access configuration mode and make the appropriate changes.

4.1.1 PORT SELECT CODE

The Port Select Code is sent as part of a select sequence by the host terminal to a V93 in order to select specific I/O modules or the main board of the M Series model to issue configuration or data commands. The Port Select Code is a programmable ASCII character string that can range from 1 to 8 characters. *Section 4.2* describes how the port select code is used to select specific I/O modules or the main board of an M Series model. **The default Port Select Code is \$BT.**

4.1.2 PASSWORD

The Password is used to prevent unauthorized users from making a connection to the modem and accessing the functions of the V93. The Password can be programmed to be any ASCII character string up to eight characters in length. The password can be enabled or disabled. *Section 4.2* describes how the Password is used when making a connection to the modem. **The default Password is BTA and disabled.**

4.1.3 INACTIVITY TIMEOUT ENABLE/DISABLE

The Inactivity Timeout feature will automatically hang up the phone connection if there is no activity for four minutes when enabled. **The default Inactivity Timeout setting is enabled.**

4.2 BASIC V93 OPERATION

Once the V93 has been connected to the phone line and configured for the desired parameters, a remote host computer can make a connection to the V93 modem over a dial line and perform data acquisition and control functions with the various M Series I/O modules. The V93 will send the following message when a remote host computer establishes a connection:

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If the password is enabled, you will be prompted to type in the desired password followed by <ENTER> when a connection to the V93 modem is first made. You are given three tries to type in the correct password before the modem hangs up.

Among the functions you can perform are configuration and data commands. Configuration commands are used to program the features of the various I/O modules and the data commands are typically used to request stored data received from an I/O module. Data commands are also used to instruct certain I/O modules to perform a specific task (e.g., energize or de-energize a relay).

Configuration is done via verbose (menu-driven) mode or non-verbose mode where a character string is sent to the desired I/O module which will configure it. You can also configure the optional system clock of the M Series unit from the V93 in the verbose mode. The supported configuration and data commands for a specific I/O module are described in the documentation for that module. All I/O modules can be programmed to communicate in self reporting mode where data is sent to the host computer as it is received.

4.2.1 COMMAND MODE

An I/O module must be in *command mode* before the V93 can access the verbose configuration mode for that I/O module, issue non-verbose mode configuration commands, or issue data commands. The main board must be in command mode to configure the system clock of the M Series unit. An I/O module or the main board is placed into command mode by sending a *select sequence* to the V93 from the remote host computer. The select sequence consists of the port select code, the desired Unit Number followed by a colon (1: to 30: - only if using a cascading application), the desired module number (0 to 16), and a terminating character of *Carriage Return* (0D Hex) or *Line Feed* (0A Hex). The module number should be "0" to place the M Series main board into command mode.

For example, to place the fourth module of a non-cascaded unit into command mode, send **\$BT4<cr>** from the host computer, where <cr> is *Carriage Return* and \$BT is the default port select code.

After you have configured and/or issued any necessary commands to the desired I/O module or main board, you would typically disconnect from the I/O module or main board by sending the port select code followed by *Carriage Return*.

NOTE: If you have placed a module into command mode from a remote terminal using the V93 modem module and the line connection is disrupted, the V93 will automatically disconnect from the module and terminate command mode. Once the line connection is re-established, you will have to place the desired module back into command mode as described above.

NOTE: If you attempt to place an I/O module or the main board into command mode and the I/O module/main board is currently selected by another host module or the service port, you will receive a **Busy!** message. You will have to wait until the other host module or service port disconnects from the desired I/O module or main board. If you attempt to connect to a module that is currently in command mode from the service port, you will receive: **Requested Module is Busy!**

4.2.2 ECHO MODE

The V93 can be placed into *echo mode* by sending seven semicolons (;) in succession. While in echo mode, the V93 will echo all characters received by the connected device back to that device. Echo mode is terminated by placing an I/O module into command mode (**\$BTm<cr>** where m is the desired module number).

4.2.3 RESET FEATURES

The M Series unit can be software reset via command from a remote host terminal connection to the V93. The Reset command consists of the port select code followed by RESET and a terminating character of *Carriage Return* or *Line Feed*.

The Reset command should be sent after a connection is established with the V93 modem and the appropriate password is sent (if enabled).

For example, if the default port select code is used (**\$BT**), you should send **\$BTRESET<cr>** from the remote host terminal where <cr> is *Carriage Return*.

The V93 has a Ring Detect Reset feature that will automatically cycle power on the M Series unit if an incoming call is detected and not answered within seventy seconds. The Ring Detect Reset feature is enabled by connecting a straight 2-wire or 4-wire cable between the auxiliary 4-pin modular connector on the V93 and the *DIAL* service modem port on the M Series chassis.

4.3 MODEM LED INDICATORS

The V93 has five LEDs on the rear panel that indicate the modem status: *TD*, *RD*, *CD*, *MR*, and *CX*. These LEDs are described below.

LED	Description
TD	Transmit Data: Indicates the modem is transmitting data.
RD	Receive Data: Indicates the modem is receiving data.
CD	Carrier Detect: Indicates a valid carrier tone has been detected.
MR	Modem Ready: Indicates the modem is ready to communicate.
CX	Connection: Indicates the V93 has a connection to the main board, to a module, or to an individual channel or port.

5 CONFIGURATION

Configuration changes for the V93 module are made from the remote host terminal, the service port, or the front panel. To access the configuration mode of the V93 from the remote host terminal, use the following procedure:

1. Make a connection to the V93 modem over a dial-up line. Enter the appropriate password if the V93 Password feature is enabled.
2. Connect to the V93 by sending the port select code, the appropriate Unit Number followed by a colon (1: to 30: - only if using a cascading application), the appropriate module number (1 to 16), and *Carriage Return* or *Line Feed*.

3. Access configuration mode by sending **\$CONFIG<cr>**.

IMPORTANT: No characters should be typed between **\$BT1<cr>** and **\$CONFIG<cr>**. If this happens, you will need to issue the disconnect command (i.e., **\$BT<cr>**) and send the configuration sequence again.

For example, if the V93 is installed in Unit 1 as Module 1, the default port select code (**\$BT**) is used, and you are not using a cascading application, send **\$BT1<cr>\$CONFIG<cr>** to enter into configuration mode.

NOTE: The procedure to access configuration mode for the V93 from the service port is the same as described above except you connect a local terminal or PC running communications software to the service port with an EIA-232 serial cable. See *Section 3.4* of the M Series DAC Base Unit manual for the required adapter and cable pinouts. The service port has a fixed serial configuration of 9600 bps, 8 bit word size, 1 stop bit, and no parity. In addition, you must send **\$BAYTECHX<cr>** to select the V93 as described in Step 2 where X = 1 to 16, then proceed to Step 3.

5.1 MAIN CONFIGURATION MENU

The V93 will respond to the receiving of **\$CONFIG<cr>** with an identification block and a menu of the available configuration options similar to the following:

```
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DAC V93 Rev. 1.00
Unit: 1 Module: 1
```

- 1) Status
- 2) Port Select Code
- 3) Program Password
- 4) Enable/Disable Inactivity Timeout
- X) Exit Configuration

Enter Request :

NOTE: This menu shows the V93 installed as Module 1. A line showing how much memory is installed will be displayed as the third line in the header if a memory module is installed.

NOTE: Menu selections are case sensitive. It is recommended your keyboard be in the CAPS LOCK position.

5.2 STATUS

By responding to the *Enter Request:* message at the end of the main configuration menu (see *Section 5.1*) with "1" (Status), you can review the current configuration of the V93. The V93 will respond with:

```
Port Select Code is:$BT
Password: Disabled
Timeout: Enabled
Unit Number is : 1
Strike any key to continue

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DAC V93 Rev. 1.00
Unit: 1 Module: 1

1) Status
2) Port Select Code
3) Program Password
4) Enable/Disable Inactivity Timeout
X) Exit Configuration

Enter Request :
```

NOTE: The Unit Number displayed can range from 1 to 32. This option is programmed from the main board of the M Series unit. Please refer to the appropriate documentation for more information on Unit Number.

You can now make whatever changes are necessary by responding to the above menu. The "X" (Exit Configuration) will return you to the operations mode.

5.3 PORT SELECT CODE

By responding to the *Enter Request:* message at the end of the main configuration menu (see *Section 5.1*) with "2" (Port Select Code), you can change the port select code to any ASCII character string from 1 to 8 characters. The V93 will respond with:

Port Select Code is:\$BT

Enter Port Select Code (Max. 8 Characters)
and ENTER when done:

Type the desired port select code followed by <ENTER>. For example, if you type #PORT followed by <ENTER>, the V93 will respond with:

Port Select Code is:#PORT

Enter Port Select Code (Max. 8 Characters)
and ENTER when done:

If no additional change is desired, type <ENTER>. The V93 will save the new port select code permanently in the non-volatile memory and return to the main configuration menu (see *Section 5.1*).

NOTE: You cannot program the port select code to be \$BAYTECH from the service port. If you wish to use \$BAYTECH as the port select code, you must program the port select code from the V93 host module.

5.4 PASSWORD

By responding to the *Enter Request:* message at the end of the main configuration menu (see *Section 5.1*) with "3" (Program Password), you can program and enable or disable the password. The password is used for security purposes to prevent unauthorized users from connecting to the V93 modem and accessing its functions. The V93 will respond with the following:

Enter Current Password:

IMPORTANT: You must know the current password in order to change the password. When you type the current password or enter a new password, the V93 module will send "*" for every character typed.

Type the current password followed by <ENTER> and the V93 will respond with:

Password is Disabled

Enter 1 For Enable or 2 For Disable:

Type "1" to enable the password or "2" to disable the password. In order to change the password, you must type "1" or "2" even if the current enable or disable status is the one desired. If you type <ENTER> in response to this prompt, the V93 will return to the main configuration menu (see *Section 5.1*). If you type "1" or "2" in response to this prompt, the V93 will respond with:

Enter New Password:

Type the desired password up to 8 ASCII characters. If the password entered is less than 8 characters, type <ENTER>. The V93 will prompt you to re-enter the password for verification as follows:

Re-Enter New Password:

Re-enter the new password exactly as done at the "Enter New Password" prompt above. The V93 will respond with:

Password Verified and Saved!

Strike any key to continue

If you do not type the new password exactly as done at the "Enter New Password" the V93 will respond with:

PASSWORD NOT SAVED!!!!!!

Strike any key to continue

At this point, you must type any key and start the entire password sequence over again by typing "3" from the main menu. Once you have successfully typed in the desired password, type any key and the V93 will return to the main configuration menu (see *Section 5.1*).

5.5 INACTIVITY TIMEOUT ENABLE/DISABLE

By responding to the *Enter Request:* message at the end of the main configuration menu (see *Section 5.1*) with "4" (Enable/Disable Inactivity Timeout), you can enable or disable the modem's inactivity timeout. The V93 will respond with:

Timeout: Enabled

Enter 1 For Enable or 2 For Disable:

Type the number corresponding to your desired choice. The modem will automatically hang up the phone connection after four minutes of inactivity when Inactivity Timeout is enabled.

The V93 will save the new Inactivity Timeout setting permanently in the non-volatile memory and return to the main configuration menu (see *Section 5.1*).

5.6 EXIT CONFIGURATION

By responding to the *Enter Request:* message at the end of the main configuration menu (see *Section 5.1*) with "X" (Exit Configuration), the V93 will exit configuration mode and return to operations mode.

VERY IMPORTANT!!! After exiting the V93 configuration mode, you must send the port select code immediately followed by *Carriage Return* (e.g., \$BT<cr>) to resume normal communications between the V93 and the relevant I/O modules. Failure to do so prevents the V93 from receiving any data from the I/O modules.

5.7 CONTROL PANEL CONFIGURATION

NOTE: This section does not apply to M Series units with LEDs on the front panel.

You can review the current status of the V93 from the control panel. To view the current configuration status for the V93 from the control panel, highlight the appropriate module number using the arrow keys and then press the *SELECT* key. The following menu will appear on the LCD display:

```
DAC-V93 F1.00 MOD 01
Display Config
Exit to Main Menu
```

Use the arrow keys (⬅️ and ➡️) to highlight "Display Config" and press the *SELECT* key. The LCD will respond with the current Port Select Code and the Inactivity Timeout Enable/Disable setting. The "Exit selection will return the unit to the main operations menu.

APPENDIX A **V93 EPROM UPGRADE**

You will receive one EPROM (chip with label) for each module to be upgraded.

The materials you will need to supply are:

Flat blade screwdriver
IC DIP extractor or a pair of curved needle-nose pliers

1. **IMPORTANT:** Remove power from the unit by depressing the power switch on the front of the unit to OFF. Also remove power cord from the AC outlet.
2. Remove the appropriate module by loosening the 2 straight slot screws that attach the connector board I/O module to the chassis and then pulling the module out.
3. Refer to *Appendix B* (V93 Mechanical Layout) and locate socket *U2*. Remove existing EPROM from socket *U2* with IC extractor or needle-nose pliers. Gradually loosen each side of the chip, alternating

pliers from side to side, so as not to bend chip pins. Pull loosened EPROM all the way out.

4. Install the new EPROM into socket *U2*. The EPROM is notched; the notch on the EPROM should line up with the notch on the socket. Be careful not to bend any of the pins. Make sure none of the pins miss their sockets. If the socket has more holes than chip pins, the pins should line up starting at the edge of the board.
5. Re-install the V93 and apply power to the unit. The upgrade is now complete. Before you begin operations, check the configuration status to make certain it matches your application. See *Section 5* for complete instructions.

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V93 MECHANICAL LAYOUT

1

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