

V.3400 Manual

For Sales or Service Contact:

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Chapter 11 V.25 bis Autodialer

GENERAL

V.25 bis is an option that allows dialing functions to be controlled using synchronous data.

Select V.25 bis through the appropriate &M command in the AT command set (Chapter 5).

If using the LCD:

- Scroll through the menu to Main Menu 5, MODIFY CONFIGURATION.
- Advance to and enter the DTE PARAMETERS submenu.
- Select SYNC DATA.
- Advance to DIAL METHOD.
- Select either V.25 BISYNC DIALER or V.25 SDLC DIALER or V.25 ASYNC DIALER and then select either ASCII or EBCDIC character format.

Note

The modem must be configured as V.25 SDLC ASCII NRZ for use with an AS400 IBM computer.

Autodialer Command Strings and Parameters

Most command strings for the autodialer include two parts: the command itself and the parameter(s) that follow. For the purposes of this chapter, parameters can be telephone numbers or anything appropriate to V.25 bis as described in the following text. Parameters are separated by semicolons.

For example:

PRN a; nnn . . . n where a = the phone number address in memory and nnn . . . n = the phone number

The a and the mn . . . n are both parameters.

Not all commands have parameters. For example the CIC command has no parameter.

GUIDELINES

Use the following guidelines when working with V25 bis software:

- An indicator enclosed in less than/greater than signs represents a specific character in the appropriate character set, ASCII or EBCDIC.

<sp> - space

- Each response below is considered an individual message per V25 bis conventions. A dial command with intermediate call progress enabled (BISYNC mode ASCII/EBCDIC character set) is illustrated:

From DTE

```
<sy><stx><stx>CRN<sp>(205)555-0124<ctx>
<sy><stx><stx>VAL<ctb>
```

To DTE

```
<sy><stx><stx>CNX<sp>@9600HPS<ctx>
```

- Spaces in a command from the DTE are optional and ignored.
- Command strings can be upper or lower case. Responses are always upper case.

- V25 bis commands are implemented in the following data formats:
- | | |
|--------------------|------|
| ASYNC | |
| BISYNC | |
| SDLC | NRZ |
| SDL C | NRZI |
| in ASCII or EBCDIC | |

- The separator fields are data format dependent.

for ASYNC [sep] = command <CR>

BISYNC [sep] = <sy><stx><stx>command <ctx>

SDLC [sep] = <Flags><Addr><ctl>command <FCS>

Where: <sy> = 16 hexadecimal

<stx> = 02 hex

<ctx> = 03 hex

<ctb> = 17 hex

<Flag> = 7E hex

<Addr> = FF hex

<ctl> = 13 hex (last frame), 03 hex (not last frame)

<FCS> = Frame Check Sequence

<CR> = Carriage Return

Invalid Responses Explanations

Except when stated otherwise, the following explanations for invalid INV responses apply:

INVCU Any transmission error (parity, framing, etc.).

INVMS Receiving too many characters for any command.

INVMS Any command followed by a semicolon ;

INVPS This message has one of three possible meanings:

- Any parameter set ending with a semicolon ;
- Any parameter set containing too many or not enough parameters; this includes
 - any command entered without parameters that requires parameters
 - any command entered with parameters that does not require parameters.
- Any parameter containing too many characters.

INVPV This message has one of three possible meanings:

- Any parameter set containing invalid characters
- Any parameter or parameter set containing no valid (only ignored) characters
- Any parameter set containing an out-of-range parameter

DIAL PARAMETERS

Table 11-1 lists and describes the parameters used in autodialing. The memory available for dialing can hold up to 40 characters. Parameters inserted for readability are not counted.

Table 11-1. V.25 bis Dial Parameters

Character	Function
0 thru 9	DTMF and pulse digit
* and #	DTMF digit
:	Wait for dial tone
W	Wait for 2nd type of dial tone
>	Pause for 1 second
=	Pause for 3 seconds
<	Pause for programmed delay time
P	Pulse dialing
T	Tone dialing
&	Flash (go on hook) for 1/2 second
:	PARM separator
Space, dash, parenthesis, period	Parameters inserted for readability

V.25 BIS COMMAND AND RESPONSE DEFINITIONS

The following sections describe the commands used with the V.25 bis autodialer and explain the responses received when each command is executed.

Dial Command CRN nm...n

The dial command is a CRN followed by the number to be dialed nm...n. The modem accepts up to 40 dial parameters, excluding the CRN command and any leading spaces.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TRN (205)-555-0124

INVMS Invalid command - message syntax error.
Examples: CRN;(205)-555-0124
CRN;(semicolon invalid)

INVP5 Invalid command - parameter syntax error.
Examples: CRN (205)-555-0124
CRN (205)-555;0124
CRN

INVPV Invalid command - parameter value error.
Examples: CRN (205)-555-012Q
CRN

CFIET Call failure - reorder or busy.

CFIRT Call failure - timeout occurred.

CFINT Call failure - no answer back tone.

CFIDT Call failure - no dial tone.

CFIAB Call failure - ABT detected but no carrier.

INC Incoming ring detected.

Program Number Command PRN a;n;n...n

The program number command is *PRN* followed by the one digit decimal address *a* and the number to be stored *m*...*n*. Each address can store up to 31 dial parameters. Ignored characters in the dial number are not stored. Nine stored numbers are available at addresses 1-9.

Responses:

Same as for the *CRN* command except for call progress responses.

Intermediate Call Progress Response

The following response is given only if enabled. See Option Definition 002 below.

CNX@nnnnnBPS - where *nnnnn* is the line speed. This connect response appears after handshake completed, but before DSR is activated. This response is required if the intermediate call progress option is enabled.

Dial Stored Number CRS a

The command for dialing a stored number is *CRS* followed by the one digit address *a* for the stored number to be dialed.

Responses:

Same as for the *CRN* command plus

CFINS Call failure - number not stored.

If the number is linked with other numbers, via a *PRL* command, failure responses are returned as

{sep/a;/call progress messages}...

where *a* is the address dialed, followed by the separator field and call progress messages (*CFI*, etc.)

If the call fails to connect and the number is linked with other numbers, the autodialer tries to call the next number in the list of linked numbers.

Request List of Stored Numbers RLN

The request list of stored numbers command is an *RLN*.

Responses:

INVCU Invalid command - command unknown.

Example: *TLN*

INVMS Invalid command - message syntax error.

Example: *RLN*;

If no number is stored at the specified address nothing is returned for that address. The separator *{sep}* is a

<cb><sy><stx>LSN<sp>

sequence for *BISYNC* format (the last *LSN* string terminates with per V25 bis). For synchronous bit-oriented operation, each *LSN* string is treated as an individual message per V25 bis.

All stored numbers are sent to the DTE as

LSNa;nm...n{sep}a;nm...n...

where *a* is the stored number address and *nm...n* is the number stored.

Disregard Incoming Call DIC

The command for disregarding an incoming call does not require parameters. If no call is incoming, the command is ignored.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.

Example: *TIC*

INVMS Invalid command - message syntax error.

Example: SIC;

Connect Incoming Call CIC

No parameters are required. If there is an incoming call, the modem immediately answers the call. If no call is incoming, the command is ignored.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.

Example: TIC

INVMS Invalid command - message syntax error.

Example: SIC;

Redial Last Number CRR n

The **CRR n** command redials the last number a maximum of *n* times. If no parameters are present, the modem redials once. Also, the maximum number of redials, the amount of time between redials, and other parameters may vary depending on application and national requirements if outside the U. S.

Responses:

Same as for the **CRS** command.

Failure response is

[sep];r;[call progress messages]...

where *r* is the recall count ($1 \leq r \leq n$; 1,2,...etc.), followed by a separator field and call progress messages (**CFI XX**, etc.). If the call fails to connect, this is repeated for the specified number of times.

Link Number by Address PRL a;b

This command links the number at address *a* with the number at address *b*. The addresses are one digit decimal values. Linking numbers enables different numbers to be dialed if a call failure occurs.

Only forward linking to one other number is allowed, so address 1 can be linked to 4 to 8 to 9 etc.; however (using this example), if address 4 is dialed by a **CRS** command without connection it links forward to 8 then to 9.

If all these fail to connect, the autodialer will not back-link to address 1 unless circular linking is used. Numbers may be linked as 4 to 5 to 3; however, if address 3 is dialed, back-linking to 5 is not allowed.

If circular linking (1 to 8 to 7 to 1) is used, dialing is discontinued after the addressed number in the dial command has been dialed twice. If only one parameter follows the **PRL** command, the number at address *a* is unlinked from its forward link.

For example, if the link list 4 to 8 to 3 to 7 to 9 to 1 exists and **PRL 7** is received, 7 would be unlinked from 9, but not from 3. This would result in two link lists: 4 to 8 to 3 to 7 and 9 to 1.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.

Example: **TRL 1:5**

INVMS Invalid command - message syntax error.

Examples: **PRL,1:5**

PRL;

INVPS Invalid command - parameter syntax error.

Examples: **PRL 1:5;**

PRL 1:0;0

PRL I;
PRL
PRL 001:5

INVVP Invalid command - parameter value error.
Examples: PRL I;Q

PRL Q;I
PRL I;45 where only addresses
01 - 09 are defined

CFILL Call failure - no connection from link list.

Request List of Linked Numbers RLL

The request list of linked numbers command is an *RLL* with no parameters.

Responses:

INVVCU Invalid command - command unknown.
Example: TTL

INVVMS Invalid command - message syntax error.
Example: RLL;

LSL List linked numbers.

In all *LSL* examples, if no number is stored at the specified address no response is sent. The separator field for BHSYNC is an

<elb><sp><sp><stx>LSL<sp>

The last *LSL* string ends with per V25 bis. For synchronous bit oriented operation, each *LSL* string is treated as an individual message per V25 bis. All linked numbers are sent to the DTE as

LSL a:l{sep}a:l

where *a* = stored address and *l* = link address.

Request List of Version RLV

The request list of version information command is an *RLV* with no parameters.

Responses:

INVVCU Invalid command - command unknown.
Example: TLV

INVVMS Invalid command - message syntax error.
Example: RLV;

LSV List version

The version information is sent to the DTE as
LSV<sp>SbBBBBbb00scppdr / comment field

where *BBBBbb* is the board number, *s* is the series number, *cc* is the controller code revision, *pp* is the data pump code revision, *dd* is the board dash number, and *r* is the printed circuit board revision followed by a comment field.

MODEM OPTIONS COMMAND PRO xxx;yy;0;0...

The program options command is *PRO* followed by the starting register address (1 to 3 decimal digits), option count (1 or 2 decimal digits) and the data for each option (1 to 3 decimal digits per option). The Options section lists all available options with definitions, possible settings, and default values.

The modem must be able to accept 40 non-ignored characters besides the *PRO* command (leading zeros and semicolons are not considered ignored characters).

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TR0 0;1;1

INVMs Invalid command - message syntax error.
Examples: PRO;0;1;1
PRO;

INVPs Invalid command - parameter syntax error.
Examples: PRO 0;1;0;
PRO 0;1;1;1
PRO
PRO 0;001;1

INVPV Invalid command - parameter value error.
Examples: PRO 0;1;Q
PRO Q;1;1
PRO 0;0;0
PRO 68;1;0

when option 68 is undefined for the modem.

INVPV<sp>xxx Invalid command - parameter value error.
Examples: PRO 10;5;0;0;2;1

This invalid message can be returned when a block of options is being changed. The conditions for this invalid response are as follows:

- An undefined option number is specified. In the above example, if option 12 is undefined for a certain modem (and no other error conditions apply) options 10 and 11 would be changed as specified in the command message. The next option to be changed would be option 12. The modem would detect that this is an undefined option, stop execution of the command, and return an INVPV012 message. Options 10 and 11 would still be changed as commanded, options 13 and 14 would be unchanged.

- An out-of-range value for a particular option is specified. In the above example, if the fourth value in the option string is undefined or out-of-range for option 13 in a certain modem (and no other error conditions apply) options 10 through 12 would be changed as specified in the command message. The next option to be changed would be option 13. The modem would then detect that the value is undefined or out-of-range for that option, stop execution of the command, and return an INVPV013 message. Options 10 through 12 would still be changed as commanded; options 13 and 14 would be unchanged.

Save Current Settings PRK
PRK saves option settings current.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TRK

INVMs Invalid command - message syntax error.
Examples: PRK;0 PRK Q

Restore Factory Settings PRP n

PRP n restores current option settings to factory option set n where n is a 1 digit decimal number.

Note

Restoring a factory option set other than factory option 9 disables the V25 synchronous dialer.

If no parameter follows the command, the modem automatically selects factory option set 1.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TRP

INVMS Invalid command - message syntax error.
Examples: PRP;1 PRP Q

INVPS Invalid command - parameter syntax error.
Examples: PRP 1; PRP 1;1 PRP 001

INVPV Invalid command - parameter value error.
Example: PRP 5

where factory default 5 is not defined for the modem.
Current modem factory options are 1 - 9.

Request List of Stored Options RLO xxx;yy

The request list of stored options command is *RLO* followed by an optional 1 to 3 digit decimal address and a 1 or 2 digit decimal count. The Options section below lists all available options with definitions, possible settings, and default values.

Responses:

INVCU Invalid command - command unknown.
Example: TLO 0;1

INVMS Invalid command - message syntax error.
Examples: RLO;0;1
RLO Q;1

INVPS Invalid command - parameter syntax error.
Examples: RLO 0;1;
RLO 0;1;4
RLO 0;001

INVPV Invalid command - parameter value error.
Examples: RLO 0;Q RLO 0;0 RLO999;45

LSO List stored options.

The separator {sep} for BISTYNC is an

<ltb><sp><stx>L SO<sp>

sequence for the sync format (the last *LSO* string terminates with per V.25 bis). For synchronous bit oriented operation, each *LSO* string is treated as an individual message per V.25 bis.

If no parameters follow, all stored options are sent to the DTE as

LSOxxx;000{sep}xxx;000...

Each value must be padded with leading zeros so that each field has three characters. Option zero would be sent as

LSO000;000

If only an address follows the command, the single requested option is sent to the DTE as

LSOxxx;000

If address and count follow the command, the requested count of options starting with the specified address are sent to the DTE as

LSOxxx;000{sep}xxx;000...

OPTIONS

This section lists the options for the V25 bis autodialer. These options can be changed using the *PRO* command or listed using the *RLO* command.

- 000-001: Not applicable
- 002: Intermediate call progress messages
 0 - Disable
 1 - Enable
 Default value = 0
- 003: Blind dial
 0 - Disable
 1 - Enable
 Default value = 0
- 004-006: Not applicable
- 007: Long space disconnect
 0 - Disable
 1 - Enable
 Default value = 1
- 008-019: Not applicable
- 020: Programmable / permissive operation
 0 - Permissive
 1 - Programmable
 Default value = 0
- 021-022: Not applicable
- 023-049: Reserved for future use
- 050: Mode
 0 - 2-wire dial-up operation (PSTN)
 1 - 4-wire leased line operation
 2 - 2-wire leased line operation
 Default value = 0
- 051: Primary transmit / receive rate
 (See Rate Select section below.)
 Default value = 54 (28800 bps)
 000-006: Not applicable
 007: 1200 bps
 008: 2400 bps
 009-033: Not applicable
 034: 4800 bps
 035: 9600 bps uncoded
 036: 9600 bps
 037-045: Not applicable
 046: 7200 bps
 047: 12,000 bps
 048: 14,400 bps
 049: 16,800 bps
 050: 19,200 bps
 051: 21,600 bps
 052: 24,000 bps
 053: 26,400 bps
 054: 28,800 bps
 055-999: Reserved for future use
- 052-054: Not applicable
- 055: Transmit clock
 0 - Internal
 1 - External
 2 - Receive (slave)
 Default value = 0
- 056: Leased line transmit level -
 Transmit level (0 through -30 dBm)
 (- (decimal) dBm)
 Default value = 0
- 057-062: Not applicable
- 063: Autoanswer
 0 - Disable
 1 - Enable (answer after 1 to 255 rings)
 Default value = 1

- 064: Line current disconnect
 0 - Off
 1 - Short (8 ms)
 2 - Long (90 ms)
 Default value = 2
- 065-075: Not applicable
- 076: Speaker control
 0 - Off
 1 - On
 2 - N/A
 3 - N/A
 4 - On until CD
 5 - N/A
 6 - Off while dialing
 Default value = 4
- 077: Speaker volume
 0 - Low
 1 - Medium
 2 - High
 Default value = 1
- 078-084: Not applicable
- 085: Constant carrier RTS/CTS delay
 0 to 250 ms
 Must be set in increments of 10 ms:
 10, 20, 30 ... 250
 Default value = 0
- 086: Not applicable
- 087: DTR dropout timer
 0 to 255 in 10 ms increments
 DTR must turn off for this length of
 time to be recognized.
 Default value = 5 (50 ms)
- 088: Not applicable
- 089: Pause in dial string
 0 - Invalid
 1 to 255 seconds
 Default value = 2
- 090: Carriage return character
 (13 decimal is ASCII and EBCDIC default)
- 091: Line feed character
 (10 decimal is ASCII default;
 37 decimal is EBCDIC default)
- 092: Guard tone
 0 = None
 1 = 550 Hz
 2 = 1800 Hz
 Default value = 0
- 093: Carrier detect delay
 0 - Off 1 to 255 in increments of 10 ms
 Default value = 6 (60 ms)
- 094: Loss of carrier disconnect
 0 - Off 1 to 255 in 100 ms increments
 Default value = 14 (1.4 sec)
- 095: DTR dial address
 Stored telephone number address to dial
 on DTR off-to-on transition
 Default value = 1
- 096: DTR dial
 0 - Disable
 1 - Enable
 2 - N/A
 Default value = 0
- 097: Not applicable

098: Call timeout

0 - Off

1 - 255 sec

Default value = 30 sec

099-102: Not applicable

103: Signal quality retrain

0 - Disable

1 - Send training sequence on poor quality
Default value = 1

104-106: Not applicable

107-110: Reserved for future use

111: Modulation mode

000: Automode

001: V.21

002: B.103

003: Reserved

004: Reserved

005: V.22

006: V.22 bis

007: V.27 ter

008: Reserved

009: V.29

010: Reserved

011: V.33

012: V.32 bis

013: V.34 (VIFast)

112: V.34 Select Threshold

000: Low

001: Medium

002: High

113: V.34 Asymmetric bit rates

000: Disabled

001: Enabled

114 - 899: Reserved for future use

900-902: Not applicable

903: Bilateral loop

0 - Disable

1 - Enable

Default value = 0

If enabled and a test is commanded, bilateral loop is defined as follows:

Test Commanded Bilateral Loop

Loop 1 Loop 2

Loop 2 Loop 1

Loop 3 Loop 4

Loop 4 Loop 3

Loop definitions are per CCITT V.54.

904: DTE commanded remote digital loopback

0 - Disable

1 - Enable

Default value = 0

905: DTE commanded local analog loopback

0 - Disable

1 - Enable

Default value = 0

906: Remote commanded test

0 - Disable

1 - Enable

Default value = 1

907: Test timer

0 - Until DTR drops

TTT - 1 to 255 sec

Default value = 0

908: Not applicable

909-999: Reserved for future use

Chapter 12 Maintenance

Warning

Disconnect power before performing maintenance. Although dangerous voltage levels are not exposed, disconnecting power will ensure an electric shock hazard is not present.

GENERAL

The modem contains no internal electronic components that can be serviced or replaced by the user. Repairs should not be attempted by the user.

FUSE

If a fuse fails, replace it with one of equal rating. Repeated failure indicates a more serious problem.

MAINTENANCE

The modem provides maintenance free service. Periodically it is necessary to remove dust that has collected on internal components. Remove dust with a soft bristle brush and low pressure air or vacuum.

Before attempting diagnostic tests, check that all connectors and plugs are firmly inserted. The test procedures will identify the faulty component in a bad communications link.

If the unit appears faulty, contact the Motorola Field Service Department at 1-800-221-4380 for service and assistance. Do not return the unit without prior instructions.

Appendix A Specifications

Size

Width 7.0 inches (17.78 cm)
Depth 10.5 inches (26.67 cm)
Height 2.25 inches (5.72 cm)
Weight 2 lbs. 13 oz. (1.28 kg)
Front Panel 32 ASCII character LCD

Environmental Conditions

Temperature:

Operation +32° F to +122° F
(0° C to +50° C)

Storage -40° F to +158° F
(-40° C to +70° C)

Humidity: 0 to 95% relative humidity: noncondensing

Power Requirements

The modem can be ordered for operation with one of three power input options.

Voltage: 115 Vac \pm 10%; 50-60 Hz,
230 Vac \pm 10%; 50-60 Hz, or
12 to 60 Vdc

Power consumption: 14 watts

Telephone Line

Balanced 600 ohm type 3002 or equivalent 16 dB nominal loss, frequency translation up to \pm 10 Hz

Digital Interface

Conforms to EIA-232D and CCITT V24