V.3225 and V.3225L Manual

Compliments of

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Chapter 7
V.25 bis Autodialer

GENERAL

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

Select this option by the front panel LCD or by the appropriate &M command in the AT command set (Chapter 5).

If using the LCD

- Scroll through the menu to Main Menu 5, MOD-IFY CONFIGURATION.

- Advance to and enter the DTE OPTIONS sub-menu.

- Select SYNC DATA.

- Advance to DIAL METHOD.

- Select either V.25 BISYNC DIALER or V.25 SDLC DIALER and then select either ASCII or EBCDIC character format.

> *Note: The modem must be configured as V.25 SDLC ASCII NRZ to use it 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 nnn...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 V.25 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 V.25 bis conventions. A dial command with intermediate call progress enabled is illustrated:

From DIE

<sy><sy><stx>CRN<sp>(205)555-0124<etx>

To DIE

<sy><sy><stx>VAL<etb>

<sy><sy><stx>CNX<sp>@9600BPS<etx>

• Spaces in a command from the DTE are optional and ignored.

• Command strings can be upper or lower case. Responses are always upper case.

• Only synchronous data formats are implemented. They include Bisync and SDLC (NRZ format) in ASCII or EBCDIC. Select NRZ or NRZI format as required by altering register S30.

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 semi-colon ;

• 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.

DIAL PARAMETERS

Table 7-1 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 7-1
V.25bis Dial Parameters

Character	Function
0 thru 9	DTMF and pulse digit
* and #	DTMF digit
: (colon)	Wait for dial tone
W	Wait for second type of dial tone
>	Pause for 1 second
=	Pause for 3 seconds
<	Pause for programmed delay time
P	Pulse dial
T	Tone dial
&	Flash (go on hook) for 1/2 ms
;	Parameter 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 $nn...n$

The dial command is a CRN followed by the number to be dialed $nn...n$. 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)

INVPS 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.

CFIDT   Call failure - no dial tone.

INC   Incoming ring detected.

Program Number Command PRN a; nn...n

The program number command is PRN followed by the one digit decimal address *a* and the number to be stored *nn ... n*. Each address can store up to 32 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.

Intermediate Call Progress Responses

The following responses are given only if enabled. See Option Definition 002 below.

CNX<sp>@nnnnnBPS<sp>cccc - where *nnnnn* is the line speed and *cccc* is an identifier with a maximum of five characters, such as V.29. 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 the PRL command, failure responses are returned as

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

where a is the address dialed, followed by the separator field <etb><sy><sy><stx> 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.

If the last number in the list fails to connect, a

CFILD   Call failed - link done

message is sent to the DTE.

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

<etb><sy><sy><stx>LSN<sp>

sequence for BISYNC format (the last LSN string terminates with <etx> per V.25 bis. For synchronous bit-oriented operation, each LSN string is treated as an individual message per V.25 bis.

All stored numbers are sent to the DTE as

LSN<sp>a;nn...n {sep}a;nn...n...

where   a is the stored number address; nn...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: DIC;

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: CIC;

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 ($1 <= r <= n$; 1,2...,etc.), followed by a separator field

<etb><sy><sy><stx>

and call progress messages (CFI, 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.
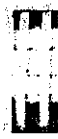
Responses:

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 1;
PRL ,
PRL 001;5

INVPV   Invalid command - parameter value error.

Examples:
PRL 1;Q
PRL Q;1
PRL 1;45   where only addresses
01 - 09 are defined

Request List of Linked Numbers
RLL

The request list of linked numbers command is RLL without parameters.

Responses:

INVCU   Invalid command - command unknown.

Example: TLL

INVMS   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 is an

<etb><sp><sp><stx>LSL<sp>

The last LSL string ends with <etx> per V.25 bis. For synchronous bit oriented operation, each LSL string is treated as an individual message per V.25 bis. All linked numbers are sent to the DTE as

LSL<sp>a:l[sep]a:l

where a=stored address and l=link address.

Responses:

INVCU   Invalid command - command unknown.

Example: TLV

INVMS   Invalid command - message syntax error.

LSV   List version

Example: RLV;

The version information is sent to the DTE as

LSV<sp>S32740&9xxx39yyyddr<sp>

**Request List of Version
RLV**

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

Responses:

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where xxx is the code revision of the microcontroller PROM and yyy is the code revision of the V.25 bis PROM. The dd is the dash number and the r is the printed circuit board revision.

**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 below 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: TRO 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 INVPV<sp>012 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 INVPV<sp>013 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 disables the V.25 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.

     Example: TRP

INVCU   Invalid command - command unknown.

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 - 4.

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) is a

<etb><sp><sp><stx>LSO<sp>

sequence for the sync format (the last LSO string terminates with <etx> 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

LSO<sp>xxx;ooo{sep}xxx;ooo...

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

LSO<sp>000:000

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

LSO<sp>xxx;ooo

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

LSO<sp>xxx;ooo{sep}xxx;ooo...

OPTIONS

This section lists the options for the V.25 bis auto-dialer. 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 = 36 (9600 bps)

052 - 054: Not applicable

055: Transmit clock
0 - Internal
1 - External
2 - Receive (slave)
Default value = 0

056: Leased line transmit level
Transmit level ({decimal} dBm)
Default value = 0

057 - 062: Not applicable

063: Autoanswer
0 - Disable
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 - N/A
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: Delay time
0 - invalid
1 to 255 seconds
Default value = 5

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 = 550Hz
2 = 1800Hz
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
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

Options 107-899: 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
1 to 255 sec
Default value = 0

908: Not applicable

Options 909-999 are reserved for future use.

Rate Select

000 - 006:	Not applicable	
007:	V.22	1200 bps
008:	V.22 bis	2400 bps
009 - 033:	Not applicable	
034:	V.32	4800 bps echo canceling
035:	V.32	9600 bps echo canceling
036:	V.32	9600 bps trellis echo canceling
037 - 045:	Not applicable	

Rate selections 046-999 are reserved for future use.