



**Smart Link Modems
AT Commands Set And
S-Registers**

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AT Commands

Modem operation is controlled by AT commands. These AT commands include the following:

- Basic AT commands, for example ATDT123
- Extended AT Commands for example AT&E, ATVA, AT%C, AT+MS
- S-Register commands, for example ATS32=8
- Fax Class 1 commands, for example AT+FTM
- Voice commands, for example AT#VTX

The command syntax and operation guidelines for each command category are described in the following sections.

A command line is a string of characters sent from a DTE (Terminal or Data Terminal Equipment) to the DCE while the DCE is in command state. Command lines have a prefix, a body and a terminator. The prefix consists of the ASCII characters **AT** or **at**. The body consists of printable ASCII characters. Space characters other than <CR> (See register S3), and <BS> (See register S5) are ignored. <CR> is command terminator.

Characters preceding the AT prefix are ignored.

AT Command Guidelines

- Basic AT commands consist of single ASCII characters, which may be preceded by a prefix character, for example **&**, and followed by a decimal number, for example **AT&W1**.
- Missing decimal parameters are interpreted as 0. For example, if you type **ATH**, the command **ATH0** is assumed.
- Fax commands are preceded with the **+F** characters and terminated by semicolon (;) or <CR> character.
- The modem supports editing command lines by recognizing the <BS> character.
- The AT command sequence may be followed by any number of commands in sequence, with the exception of commands Z, D or A, where all characters following on the same command line will be ignored.

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- When a syntax error is found in the command line, an ERROR response will be returned to the DTE. Execution of commands D and A will be aborted if another character is entered before completion of the handshake.
- When the modem has entered on-line data mode, it is possible to break the data transmission in order to issue more AT commands. This is done by the DTE sending a sequence of three escape characters (defined in S2, '+' by default).

AT Command Set

The modem will comply with the commands listed below. Parameters applicable to each command are listed below. Default factory configuration settings are marked by an asterisk *.
Features marked with (-) are not yet available in current version.

Basic AT Commands

- A/ Re-execute Command
The modem repeats the last command line sent by the DTE. Usually used for re-dialing.
Note: This command should **not** be terminated by <CR>.
- A Answer
The modem will go off-hook and attempt to answer an incoming call. Upon successful completion of handshake, the modem will go on-line in answer mode.
Notes:
If +FCLASS=0 is selected, the modem will enter the connect state after exchanging carrier with the remote system. If no carrier is detected within the period specified in S7, the modem hangs up. Any character entered while connecting will abort the connection process.
If +FCLASS=1, the modem will go off-hook in V21 answer mode. It will generate the V21 2100 Hz answer tone for 3 +/- 0.5 seconds, and following a delay of 70 ms, will proceed as if the +FTH=3 command were issued. At any stage up to (but excluding) the +FTH=3 command state, any character will abort the communication.
If +FCLASS=8 (#CLS=8), the modem will go off-hook and a voice session will take place.
Related S-Reg: S0

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Bn CCITT Control

B0 Connect at V.22 1200 bps

Result codes:

OK n=0

Error Otherwise

Dn Dial

Directs the modem to go on-line, dial according to the string entered, and attempt to establish a connection.

The Dial String may consist of any of the characters described below:

- * T Tone dialing (first character in the string)
- P Pulse dialing (first character in the string)
- L Redial last dialed number (first character in the string)
- 0-9 Digits 0 to 9.
- * Asterisk (tone only)
- # Hash (tone only)
- W Wait for dial tone; the modem will wait for dial tone before dialing the digits following "W". S6 register will be used for timeout. (X3 or higher)
- , (Comma); Pause for the time specified by S8 before resuming the dialing
- ; (Semicolon) Return to command mode after dialing. This allows the user to issue additional AT commands while remaining off-hook. Actual call progress will be entered only after a dial command issued without the ";" terminator.
- S=n Dial the number stored in the directory; n=0-3 (see &Z).
- ! Flash; The modem will go on hook for a time defined by S24.
- @ Wait for silence; The modem will wait for at least 5 seconds of silence before resuming the dialing. If no such silence is detected before the expiration of the call abort timer (S7), the modem will terminate with NO ANSWER response (or BUSY if applicable). If answer tone arrives during execution of this parameter, the modem handshakes. (X3 or higher)
- (), < > (space) String format characters - ignored
- <i> any other character - ignored.

Notes:

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If +FCLASS=0 is selected, the modem will attempt to connect with another data modem. The modem will use the time period specified in S6 and S7 as time-outs in the handshake process. If a timeout expires, the modem will go on-hook and respond with NO CARRIER response.

The command will be aborted in progress is a DTE character is entered before completion of the handshake.

If +FCLASS=1, the modem will attempt to connect with a fax machine (or modem) by entering the HDLC V21 channel 2 receive state (as if +FRH=3 had been issued).

The command will be aborted upon receipt of a DTE character if the modem has not finished dialing. In this case the modem will go on-hook and return to command mode responding with NO CARRIER message. If the modem has finished dialing, It proceeds as if +FRH=3 command has been issued.

If +FCLASS=8 (#CLS=8), the modem will go off-hook in V21 answer mode. It will decide (based on timers) when the other side answers in voice and a voice session will take place.

Related S-Reg: S5,S6,S7,S16,S22,S28,S56

En Set local echo

The modem enables/disables echo of characters to DTE. Parameter value is written to S13.

E0 Disable command echo.

* E1 Enable command echo.

Result codes:

OK n=0 or 1

Error Otherwise

Related S-Reg: S13

Hn Set ON/OFF hook

H0 Modem hangs up (goes on-hook).

* H1 Modem goes off hook.

Result codes:

OK n=0 or 1

Error Otherwise

In Identification/Information

I1 Modem Name, Vendor Name, Modem Version,
for example :

ModemX

ModemWorks Ltd.

Ver 1.10

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- I2 SW Provider /SW Version, for example
Smart Link Ltd.
Ver 1.20
- I3 Chipset Vendor/Chipset ID, for example
Chip Vendor Ltd.
XY4220
- I4 Modem active profile for example,
Active Profile:
S00=000 S01=000 S02=000 S03=000 S04=000
S05=000 S06=000 S07=000 S08=000 S09=000
S10=000 S11=000 S12=000 S13=000 S14=000
S15=000 S16=000 S17=000 S18=000 S19=000
S20=000 S21=000 S22=000 S23=000 S24=000
S25=000 S26=000 S27=000 S28=000 S29=000
S30=000 S31=000 S32=000 S33=000 S34=000
S35=000 S36=000 S37=000 S38=000 S39=000
S40=000 S41=000 S42=000 S43=000 S44=000
S45=000 S46=000 S47=000
- I5 Stored profile 0
Active Profile 0:
(Same format as above)
- I6 Stored profile 1
Active Profile 1:
(Same format as above)
- I7 Display stored phone numbers
(See &Z command)
- Ln Speaker volume
Select speaker volume.
L0 L
L1 Low
* L2 Medium
L3 High
Result codes:
OK n=0-3
Error Otherwise

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Related S-Reg: S30

Mn Speaker control
Select when the speaker is On/Off.

M0 Speaker always OFF

* M1 Speaker ON from start of dialing until receiving carrier

M2 Speaker always ON

M3 Speaker OFF from end of dialing until receiving carrier

Result codes:
OK n=0-3
Error Otherwise
Related S-Reg: S29

Nn Automode control
Enable/Disable Automode detection.

N0 Automode detection disabled. A subsequent handshake will be conducted according to the contents of S32.

* N1 Automode enabled. A subsequent handshake will be conducted according to the Automode algorithm.

Result codes:
OK n=0 or 1
Error Otherwise
Related S-Reg: S31

On Returns to on-line data mode
This command is normally used to connect the DTE back after an escape (+++) has been issued.

O0 Return to on-line data mode.

O1 Return to on-line data mode, retrain first.

Result codes:
OK n=0-1
Error Otherwise

P Pulse dialing
Forces pulse dialing. Applies to subsequent dialing commands.
This command holds until the next T dial modifier or T command is received.

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The modem will go off hook and attempt to answer an incoming call. Upon successful completion of handshake, the modem will go on-line in answer mode.

Related S-Reg: S16

Q Quiet result codes control

- * Q0 Enable sending result codes to DTE.
- Q1 Disable sending result codes to DTE.

Result codes:

OK n=0 or 1

Error Otherwise

Related S-Reg: S14

S Read/Write S-Register

This command has a few derivatives:

Sn=v Sets the value v (decimal) to S-register n (v=0-255)

Sn? Displays the value of S-register in decimal format (3 digits)

Note: Some registers are read-only

Result codes:

OK All parameters valid

Error Invalid S register or value. Trying to write to a read-only register

T Tone dialing

Forces tone dialing. Applies to subsequent dialing commands.

This command holds until the next T dial modifier or T command is received.

This command changes S14 to reflect the current dialing mode.

Related S-Reg: S16

Vn Verbose/Numeric result codes

Select the time of result messages sent to the DTE.

For a list of result codes and verbal messages see X command.

- * V0 Short form (numeric) result codes to be sent to DTE.

V1 Long form (verbose) result codes to be sent to DTE.

Result codes:

OK n=0 or 1

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Error otherwise
Related S-Reg: S15

- Xn Extended result codes
Select the subset of result codes to be used by the modem to the DTE.
If the modem is in fax mode (+FCLASS=1), the only message sent to indicate connection is "CONNECT" without a speed indication.
- X0 Supported messages: OK, CONNECT, RING, NO CARRIER and ERROR, Blind call enabled.
- X1 Supported messages: OK, CONNECT xxxx, RING, NO CARRIER and ERROR, Blind call enabled.
- X2 Same as X1 + NO DIAL TONE message, Blind call disabled
- X3 Same as X1 + BUSY message, Blind call enabled.
- * X4 All messages supported, Blind call disabled (see list below).

Notes:

W,@ dial modifiers are ignored in X1, X2
S6 (Wait before dial) is ignored in X2, X4 if no W is specified in dial string
S6 is set to 0 means a blind call

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Table 1 - Result Codes

| Result Message Code | X0 | X1 | X2 | X3 | X4 |
|---------------------|----|----|----|----|----|
| 0 OK | * | * | * | * | * |
| 1 CONNECT | * | * | * | * | * |
| 2 RING | * | * | * | * | * |
| 3 NO CARRIER | * | * | * | * | * |
| 4 ERROR | * | * | * | * | * |
| 5 CONNECT 1200 | 1 | * | * | * | * |
| 6 NO DIAL TONE | 3 | 3 | * | 3 | * |
| 7 BUSY | 3 | 3 | 3 | * | * |
| 8 NO ANSWER | 3 | 3 | 3 | * | * |
| 9 CONNECT 0300 | 1 | * | * | * | * |
| 10 CONNECT 0600 | 1 | * | * | * | * |
| 11 CONNECT 2400 | 1 | * | * | * | * |
| 12 CONNECT 4800 | 1 | * | * | * | * |
| 13 CONNECT 7200 | 1 | * | * | * | * |
| 27 CONNECT 9600 | 1 | * | * | * | * |
| 14 CONNECT 12000 | 1 | * | * | * | * |
| 15 CONNECT 14400 | 1 | * | * | * | * |
| 16 CONNECT 16800 | 1 | * | * | * | * |
| 17 CONNECT 19200 | 1 | * | * | * | * |
| 18 CONNECT 21600 | 1 | * | * | * | * |
| 19 CONNECT 24000 | 1 | * | * | * | * |
| 20 CONNECT 26400 | 1 | * | * | * | * |
| 21 CONNECT 28800 | 1 | * | * | * | * |
| 22 CONNECT 31200 | 1 | * | * | * | * |
| 23 CONNECT 33600 | 1 | * | * | * | * |
| 24 CONNECT 34800 | 1 | * | * | * | * |
| 25 CONNECT 40000 | 1 | * | * | * | * |
| 26 CONNECT 42000 | 1 | * | * | * | * |
| 28 CONNECT 44000 | 1 | * | * | * | * |
| 29 CONNECT 46000 | 1 | * | * | * | * |
| 30 CONNECT 48000 | 1 | * | * | * | * |
| 31 CONNECT 50000 | 1 | * | * | * | * |
| 32 CONNECT 52000 | 1 | * | * | * | * |
| 33 CONNECT 54000 | 1 | * | * | * | * |
| 34 CONNECT 56000 | 1 | * | * | * | * |
| 35 CONNECT 57600 | 1 | * | * | * | * |
| 36 CONNECT 115200 | 1 | * | * | * | * |
| Result Message | X0 | X1 | X2 | X3 | X4 |

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| Code | | | | | | |
|------|-------------------------|---|---|---|---|---|
| 37 | CONNECT 230400 | * | * | * | * | |
| 38 | CONNECT 460800 | 1 | * | * | * | * |
| 39 | CONNECT 921600 | 1 | * | * | * | * |
| 40 | CONNECT 32000 | * | * | * | * | |
| 41 | CONNECT 34000 | 1 | * | * | * | * |
| 42 | CONNECT 36000 | 1 | * | * | * | * |
| 43 | CONNECT 38000 | * | * | * | * | * |
| 44 | CONNECT 58000 | * | * | * | * | * |
| 45 | CONNECT 60000 | * | * | * | * | * |
| 46 | CONNECT 28000 | * | * | * | * | * |
| 47 | CONNECT 29333 | * | * | * | * | * |
| 48 | CONNECT 30666 | * | * | * | * | * |
| 49 | CONNECT 33333 | * | * | * | * | * |
| 50 | CONNECT 34666 | * | * | * | * | * |
| 51 | CONNECT 37333 | * | * | * | * | * |
| 52 | CONNECT 38666 | * | * | * | * | * |
| 53 | CONNECT 41333 | * | * | * | * | * |
| 54 | CONNECT 42666 | * | * | * | * | * |
| 55 | CONNECT 45333 | * | * | * | * | * |
| 56 | CONNECT 46666 | * | * | * | * | * |
| 57 | CONNECT 49333 | * | * | * | * | * |
| 58 | CONNECT 50666 | * | * | * | * | * |
| 59 | CONNECT 53333 | * | * | * | * | * |
| 60 | CONNECT 54666 | * | * | * | * | * |
| | | | | | | |
| 70 | FAX | * | * | * | * | * |
| 71 | DATA | * | * | * | * | * |
| | | | | | | |
| 100 | VCON | 4 | 4 | 4 | 4 | * |
| 101 | DELAYED | 4 | 4 | 4 | * | * |
| 102 | BLACKLISTED | 4 | 4 | 4 | * | * |
| | | | | | | |
| 66 | COMPRESSION: CLASS 5 | - | * | * | * | * |
| 67 | COMPRESSION: V.42BIS | - | * | * | * | * |
| 69 | COMPRESSION: NONE | - | * | * | * | * |
| 76 | PROTOCOL: NONE | - | * | * | * | * |
| 77 | PROTOCOL: LAPM | - | * | * | * | * |
| 78 | PROTOCOL: MNP | - | * | * | * | * |
| | | | | | | |
| 1021 | MODULATION: V.21 | - | * | * | * | * |

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| | | | | | | |
|------|------------------------|---|---|---|---|---|
| 1022 | MODULATION: V.22 | - | * | * | * | * |
| 1032 | MODULATION: V.32 | - | * | * | * | * |
| 1034 | MODULATION: V.34 | - | * | * | * | * |
| 1090 | MODULATION: V.90 | - | * | * | * | * |
| 1092 | MODULATION: V.92 | - | * | * | * | * |
| 1103 | MODULATION: B103 | - | * | * | * | * |
| 1122 | MODULATION: V.22BIS | - | * | * | * | * |
| 1132 | MODULATION: V.32BIS | - | * | * | * | * |
| 1134 | MODULATION: V.34BIS | - | * | * | * | * |
| 1212 | MODULATION: B212 | - | * | * | * | * |
| +F4 | +FCERROR | | * | * | * | * |

<*> message will be generated when n has been selected

<i> message will be replaced by message <l> when n has been selected

<-> message will not be generated when n has been selected.

Related S-Reg: S56

- Yn Select default configuration
Select the default user defined configuration.
Note: The default configuration is not loaded by Yn (See Zn)
- * Y0 Select user template 0
Y1 Select user template 1
Y2 Select factory setting 0
Y3 Select factory setting 1
Related S-Reg: S161

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Zn Select user defined configuration
 Select the user defined configuration.
Z0 Select default user template (as defined by Yn)
Z1 Select user template 0
Z2 Select user template 1
Z3 Select factory setting 0 (&F0)
Z4 Select factory setting 1 (&F1)
Result codes:
OK n=0-5
Error Otherwise
Related S-Reg: S59

AT+GM Commands - Model And Manufacturer Identification

Note: Commands in this section are supported starting from drivers version 2.90 and up.

+GMI Request Manufacturer Identification (similar to AT13)
 for example:
 ModemWorks Ltd.

+GMM Request Model Identification (similar to AT12)
 for example:
 ModemX
 Ver 2.90.00

+GMR Request Revision Identification
 for example:
 SW Vendor
 Ver 2.90.00
 MV (CID)

AT+GCI Command – Country Of Installation

Note: Commands in this section are supported starting from drivers version 2.90 and up.

Indicate or select the country of installation. The modem uses this setting to determine country-specific functions.

Note: There are now two alternative ways to set the country for the modem: either through AT+GCI command or using the “Modem Settings” utility in the “Control Panel” of the OS.

| | |
|--------------------------|---|
| +GCI=<T.35 country code> | <p>Sets current country.</p> <p>Valid country codes are hexadecimal numbers based on ITU-T.35. See below for a list of valid codes.</p> <p>Example - setting the current country to USA: AT+GCI=B5</p> |
| +GCI? | <p>Reports the hexadecimal numeric value corresponding to the current country setting.</p> <p>For example, when modem is set to France the response will be: +GCI:3D</p> |
| +GCI=? | <p>Reports the list of numerical values corresponding to the country or countries that are supported by the modem.</p> <p>Example: +GCI:(20,73,B5)</p> <p>indicates the modem can be set for Canada, Mexico or the USA.</p> |

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Valid Country Codes

Note: Your modem may not support some of the countries listed below.

| | |
|--------------------------------|----|
| Japan | 00 |
| Albania | 01 |
| Algeria | 02 |
| American Samoa | 03 |
| Germany (Federal Republic of) | 04 |
| Anguilla | 05 |
| Antigua and Barbuda | 06 |
| Argentina | 07 |
| Ascension (see S. Helena) | 08 |
| Australia | 09 |
| Austria | 0A |
| Bahamas | 0B |
| Bahrain | 0C |
| Bangladesh | 0D |
| Barbados | 0E |
| Belgium | 0F |
| Belize | 10 |
| Benin (Republic of) | 11 |
| Bermudas | 12 |
| Bhutan (Kingdom of) | 13 |
| Bolivia | 14 |
| Botswana | 15 |
| Brazil | 16 |
| British Antarctic Territory | 17 |
| British Indian Ocean Territory | 18 |
| British Virgin Islands | 19 |
| Brunei Darussalam | 1A |
| Bulgaria | 1B |
| Myanmar (Union of) | 1C |
| Burundi | 1D |
| Byelorussia | 1E |
| Cameroon | 1F |
| Canada | 20 |
| Cape Verde | 21 |
| Cayman Islands | 22 |
| Central African Republic | 23 |
| Chad | 24 |
| Chile | 25 |
| China | 26 |
| Colombia | 27 |
| Comoros | 28 |
| Congo | 29 |

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| | |
|---------------------------------------|----|
| Cook Islands | 2A |
| Costa Rica | 2B |
| Cuba | 2C |
| Cyprus | 2D |
| Czech and Slovak Federal Republic | 2E |
| Cambodia | 2F |
| Democratic People's Republic of Korea | 30 |
| Denmark | 31 |
| Djibouti | 32 |
| Dominican Republic | 33 |
| Dominica | 34 |
| Ecuador | 35 |
| Egypt | 36 |
| El Salvador | 37 |
| Equatorial Guinea | 38 |
| Ethiopia | 39 |
| Falkland Islands | 3A |
| Fiji | 3B |
| Finland | 3C |
| France | 3D |
| French Polynesia | 3E |
| French Southern and Antarctic Lands | 3F |
| Gabon | 40 |
| Gambia | 41 |
| Germany (Federal Republic of) | 42 |
| Angola | 43 |
| Ghana | 44 |
| Gibraltar | 45 |
| Greece | 46 |
| Grenada | 47 |
| Guam | 48 |
| Guatemala | 49 |
| Guernsey | 4A |
| Guinea | 4B |
| Guinea-Bissau | 4C |
| Guayana | 4D |
| Haiti | 4E |
| Honduras | 4F |
| Hongkong | 50 |
| Hungary (Republic of) | 51 |
| Iceland | 52 |
| India | 53 |
| Indonesia | 54 |
| Iran (Islamic Republic of) | 55 |
| Iraq | 56 |
| Ireland | 57 |
| Israel | 58 |
| Italy | 59 |

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| | |
|------------------------------------|----|
| Cote d'Ivoire | 5A |
| Jamaica | 5B |
| Afghanistan | 5C |
| Jersey | 5D |
| Jordan | 5E |
| Kenya | 5F |
| Kiribati | 60 |
| Korea (Republic of) | 61 |
| Kuwait | 62 |
| Lao (People's Democratic Republic) | 63 |
| Lebanon | 64 |
| Lesotho | 65 |
| Liberia | 66 |
| Libya | 67 |
| Liechtenstein | 68 |
| Luxembourg | 69 |
| Macau | 6A |
| Madagascar | 6B |
| Malaysia | 6C |
| Malawi | 6D |
| Maldives | 6E |
| Mali | 6F |
| Malta | 70 |
| Mauritania | 71 |
| Mauritius | 72 |
| Mexico | 73 |
| Monaco | 74 |
| Mongolia | 75 |
| Montserrat | 76 |
| Morocco | 77 |
| Mozambique | 78 |
| Nauru | 79 |
| Nepal | 7A |
| Netherlands | 7B |
| Netherlands Antilles | 7C |
| New Caledonia | 7D |
| New Zealand | 7E |
| Nicaragua | 7F |
| Niger | 80 |
| Nigeria | 81 |
| Norway | 82 |
| Oman | 83 |
| Pakistan | 84 |
| Panama | 85 |
| Papua New Guinea | 86 |
| Paraguay | 87 |
| Peru | 88 |
| Philippines | 89 |
| Poland (Republic of) | 8A |

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| | |
|----------------------------------|----|
| Portugal | 8B |
| Puerto Rico | 8C |
| Qatar | 8D |
| Romania | 8E |
| Rwanda | 8F |
| Saint Kitts and Nevis | 90 |
| Saint Croix | 91 |
| Saint Helena and Ascension | 92 |
| Saint Lucia | 93 |
| San Marino | 94 |
| Saint Thomas | 95 |
| Sao Tom and Principe | 96 |
| Saint Vincent and the Grenadines | 97 |
| Saudi Arabia | 98 |
| Senegal | 99 |
| Seychelles | 9A |
| Sierra Leone | 9B |
| Singapore | 9C |
| Solomon Islands | 9D |
| Somalia | 9E |
| South Africa | 9F |
| Spain | A0 |
| Sri Lanka | A1 |
| Sudan | A2 |
| Suriname | A3 |
| Swaziland | A4 |
| Sweden | A5 |
| Switzerland | A6 |
| Syria | A7 |
| Tanzania | A8 |
| Thailand | A9 |
| Togo | AA |
| Tonga | AB |
| Trinidad and Tobago | AC |
| Tunisia | AD |
| Turkey | AE |
| Turks and Caicos Islands | AF |
| Tuvalu | B0 |
| Uganda | B1 |
| Ukraine | B2 |
| United Arab Emirates | B3 |
| United Kingdom | B4 |
| United States | B5 |
| Burkina Faso | B6 |
| Uruguay | B7 |
| U.S.S.R. | B8 |
| Vanuatu | B9 |
| Vatican City State | BA |
| Venezuela | BB |

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| | |
|---------------------|----|
| Viet Nam | BC |
| Wallis and Futuna | BD |
| Western Samoa | BE |
| Yemen (Republic of) | BF |
| Yemen (Republic of) | C0 |
| Yugoslavia | C1 |
| Zaire | C2 |
| Zambia | C3 |
| Zimbabwe | C4 |

AT& Commands

- &An Connect message format
Select the format of the CONNECT message.
- * &A0 no extra messages besides CONNECT xxxxx
&A1 Add Modulation indicator:
V.21/ V.22/ V.22BIS/ V.32/ V.32BIS/ V.34/
V.34BIS/ B103/ B212
For example:
Modulation: V.34
&A2 Add Error Detection Protocol and Data
Compression indicators.
For example:
Protocol: LAPM/MNP/NONE
Compression: CLASS 5/V.42BIS/NONE
&A3 Add Modulation Indicator + Error Detection
Protocol + Data Compression indicators (see
above).
&A7 Add transmit rate indicator (TXRATE).
For example:
TXRATE 26400
Related S-Reg: S70, S71
- &Cn Control Carrier Detect (CD,RLSD) behavior
Controls the RLSD output behavior.
&C0 RLSD is assumed to be ON all the time
- * &C1 RLSD follows the carrier state
Result codes:
OK n=0 or 1
Error Otherwise
Related S-Reg: S60
- &Dn Controls DTR behavior (NA)
Controls the DTR output behavior.
Note: This command is supported for compatibility.
It has no significance in Smart Link's modems
environment.
- * &D0 DTR is taken to be ON all the time
&D1 DTR drop causes entry to command mode without
disconnect
&D2 DTR follows DTR circuit definition
&D3 DTR drop causes software reset (as in Z0)
Result codes:

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| | | |
|---|---|---|
| | OK | n=0-3 |
| | Error | Otherwise |
| | Related S-Reg: | S63 |
| &En | Connect message speed source Select the requested source for the speed field in the CONNECT message. | |
| * | &E0 | DCE Speed |
| | &E1 | DTE Speed |
| Note: Since a virtual port is involved, the DTE is not bound by any UART limitation, and may be theoretically set as high as 921600. DTE speed is supported for compatibility only. It bears little significance in Smart Link's modem environment. | | |
| | Related S-Reg: | S71 |
| &Fn | Sets factory configuration Select one of the factory settings. &F0 Select factory setting 0 &F1 Select factory setting 1 Result codes: OK n=0-1 Error Otherwise Related S-Reg: S59 | |
| &Hn | Sets flow control Select the user defined configuration. &H0 Flow control disabled (NA) | |
| * | &H1 | "HW" flow control RTS/CTS (emulation) |
| | Result codes: | OK n=0-1 Error Otherwise Related S-Reg: S62 |
| &Kn | Same as %Cn | |
| &Pn | Set pulse dial make/break ratio | |
| * | &P0 | US & Canada 39%/61% (10 pps) |
| | &P1 | UK & Hong Kong 33%/67% (10 pps) |
| | &P2 | Same as 0, except at 20 pps |
| | &P3 | Same as 1, except at 20 pps |
| | Result codes: | OK n=0-3 |

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Error Otherwise
Related S-Reg: S28

&Rn Controls RTS behavior
Controls the RTS output behavior.

Note: This command is supported for compatibility.
It has no actual effect

&R0 RTS ignored
&R1 Modem receives data only on RTS (NA)
Result codes:
OK n=0 or 1
Error Otherwise
Related S-Reg: S61

&Sn Controls DSR behavior

Note: This command is supported for compatibility.
It has no actual effect.

&S0 DSR override (is assumed to be ON all the time)
&S1 DSR follows circuit definition
Result codes:
OK n=0 or 1
Error Otherwise
Related S-Reg: S64

&V Display Active profile, Stored Profiles, Stored Phone
Numbers (Equivalent to I4-I7 combined)

&Wn Writes current configuration
&W0 Write to template 0
&W1 Write to template 1
Result codes:
OK n=0-1
Error Otherwise
Written to registry.

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&Zn Stores dial string
Stores/Displays dial string (up to 47 characters)
&Zn=s Store dial string (n=0-4)
&Zn=L Store the last dialed string (n=0-4)
&Zn? Display the nth string
&ZL? Display the last dialed string
Written to registry.

AT\ Commands - Error correction control

- \An Maximum MNP block Size
 \A0 64 characters maximum block size
* \A1 128 characters maximum block size
 \A2 192 characters maximum block size
 \A3 256 characters maximum block size
Result codes:
OK n=0-3
Error Otherwise
Related S-Reg: S<basereg+1> of V.42 registers
- \Bn Transmit break to remote (-)
In non-error correction mode, the modem will transmit a break signal to the remote modem with a length of n*100ms. If a number above 9 is entered, 9 is used.
Result codes:
OK if connected in data modem mode
Error if not connected or if connected in fax modem mode
- \Kn Break Control (-)
Controls the response of the modem to a break received from DTE or a remote modem or the \Bn command.
The behavior parameter is written to Sxx
 \K0 Enter on-line command mode, no break sent to remote modem
 \K1 Clear data buffers and send break to remote modem
 \K2 Same as 0
 \K3 Send break to remote modem immediately
 \K4 Same as 0
* \K5 Send a break to remote modem in sequence with transmitted data
Related S-Reg: S<basereg+x> of V.42 registers
Result codes:
OK n=0-5
Error Otherwise

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\Nn Error correction operating mode

 \N0 Normal (Speed buffering) - No error correction

 \N1 Direct (pass-through) 128 characters maximum
 block size

 \N2 Reliable (error correction) mode. The Modem will
 attempt LAPM and then MNP

 * \N3 Auto reliable mode. Same as \N2, but will fall back
 to Normal

 \N4 LAPM error correction mode only, hang up upon
 failure.

 \N5 MNP error correction mode only, hang up upon
 failure.

 Result codes:

 OK n=0-5

 Error Otherwise

 Related S-Reg: S<basereg> of V.42 registers

AT% Commands

%Cn Compression control
 %C0 Disable data compression
 %C1 Enable MNP5 data compression
 %C2 Enable V.42bis data compression
* %C3 Enable MNP5/V.42bis data compression
Result codes:
 OK n=0-3
 Error Otherwise
Related S-Reg: S<basereg+2> of V.42 registers

%En Line quality monitor control
Controls whether or not the modem will automatically monitor the line quality and request a retrain (%E1), or fall back when quality is insufficient or fall forward when line quality improves (%E2).

* %E0 Disable line quality control
 %E1 Enable line quality control and auto retrain
 %E2 Enable line quality control and fallback/forward

Result codes:
 OK n=0-3
 Error Otherwise
Related S-Reg: S39

AT+MS Command

+MS Modulation select

This command selects the modulation, optionally enables/disables Automode, and optionally specifies the lowest and highest connection rates.

The command format is:

AT+MS=

[<mod>][,<automode>][,<min_rate>][,<max_rate>]]
]

<mod> a decimal number specifying the preferred modulation (automode enabled), or the modulation (automode disabled).

<automode> 0/1 Automode disabled/enabled

<min_rate> minimum rate for connection. If lower than the actual minimum rate for the selected modulation, the actual lowest supported rate will be taken.

<max_rate> maximum rate for connection. If higher than the actual maximum rate for the selected modulation, the actual highest supported rate will be taken.

Table 2 - +MS command parameters

| <mod> | | Modulation possible rates |
|-------|----------|---|
| 22 | V.22 | 1200 |
| 122 | V.22bis | 2400,1200 |
| 23 | V.23 | 1200 |
| 32 | V.32 | 9600, 4800 |
| 132 | V.32bis | 14400, 12000, 9600, 7200, 4800 |
| 34 | V.34 | 33600, 31200, 28800, 26400, 24000, 21600, 19200,16800, 14400, 12000, 9600 |
| 56 | K56Flex | 32000, 34000, 36000,56000 |
| 90 | V.90 | 29333, 30666, 32000,56000 |
| 212 | Bell 212 | 1200 |
| 103 | Bell 103 | 300 |

Examples:

AT+MS=34,0,4800,33600 V.34, No Automode, Min. speed 4800, Max speed 33600

AT+MS=,1 Automode

AT+MS=32,1,,14400 V.32 Automode, Max speed 14400 (min speed as before)

Factory Settings: 90,1,300,56000

The requested modulation scheme will be written to S32

The requested min rate will be written to S33

The requested max rate will be written to S34

The actual rate may be read from S35

The actual modulation scheme may be read from S37

(The codes as specified in the Xn command)

Other derivatives of the +MS command:

AT+MS? report current MS settings (e.g.
34,1,9600,33600)

AT+MS=? list the supported values +MS:(22,122.....),
(0,1), (300-33600), (300-33600)

Result codes:

OK Syntax OK

Error Otherwise

Related S-Reg: S31-S37

AT+F Commands - Fax Support

| +FCLASS=<value> | Sets Data/Fax Class1/Voice (0,1,8) mode. +FCLASS=<value> [<value> - 0,1,8 (Data/Fax Class1/Voice)] | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|-------|------------|----|-------------------|----|-------------------|----|---------------|----|--------------------|----|---------------------|----|---------------|----|--------------------|----|---------------------|-----|---------------------|-----|----------------------|-----|---------------------|
| | Result codes: OK Syntax OK Error Otherwise +FCLASS? Returns the current setting Related S-Regs: S32, S150 | | | | | | | | | | | | | | | | | | | | | | | | |
| +FAE | Data/Fax Auto Answer +FAE=<value> [<value> - 0,1 (Data/Fax Class1)] +FAE? Returns the current setting Related S-Regs: S151 | | | | | | | | | | | | | | | | | | | | | | | | |
| +FTS=<value> | Stops transmission and waits. Terminates transmission and waits for <value>*10ms interval before responding with OK. ERROR is issued if the modem is on-hook. +FTS? Returns the current setting | | | | | | | | | | | | | | | | | | | | | | | | |
| +FRS=<value> | Receives Silence. Report back to DTE with OK after <value>*10ms silence interval has been detected. The command is aborted if any character is received from the DTE (The response will still be OK). ERROR is issued if modem is on-hook. +FRS? Returns the current setting | | | | | | | | | | | | | | | | | | | | | | | | |
| +FTM=<value> | Transmits data according to the defined modulation. ERROR is issued if modem is on-hook. <table><tr><th>Value</th><th>Modulation</th></tr><tr><td>24</td><td>V.27 ter 2400 bps</td></tr><tr><td>48</td><td>V.27 ter 4800 bps</td></tr><tr><td>72</td><td>V.29 7200 bps</td></tr><tr><td>73</td><td>V.17 7200 bps long</td></tr><tr><td>74</td><td>V.27 7200 bps short</td></tr><tr><td>96</td><td>V.29 9600 bps</td></tr><tr><td>97</td><td>V.17 9600 bps long</td></tr><tr><td>98</td><td>V.17 9600 bps short</td></tr><tr><td>121</td><td>V.17 12000 bps long</td></tr><tr><td>122</td><td>V.17 12000 bps short</td></tr><tr><td>145</td><td>V.17 14400 bps long</td></tr></table> | Value | Modulation | 24 | V.27 ter 2400 bps | 48 | V.27 ter 4800 bps | 72 | V.29 7200 bps | 73 | V.17 7200 bps long | 74 | V.27 7200 bps short | 96 | V.29 9600 bps | 97 | V.17 9600 bps long | 98 | V.17 9600 bps short | 121 | V.17 12000 bps long | 122 | V.17 12000 bps short | 145 | V.17 14400 bps long |
| Value | Modulation | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | V.27 ter 2400 bps | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | V.27 ter 4800 bps | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | V.29 7200 bps | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | V.17 7200 bps long | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | V.27 7200 bps short | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | V.29 9600 bps | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | V.17 9600 bps long | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | V.17 9600 bps short | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | V.17 12000 bps long | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | V.17 12000 bps short | | | | | | | | | | | | | | | | | | | | | | | | |
| 145 | V.17 14400 bps long | | | | | | | | | | | | | | | | | | | | | | | | |

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146 V.17 14400 bps short

+FTM=? Return "24, 4, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146"

+FRM= Receives data according to the defined modulation
<value> (See Values above)

ERROR is issued if modem is on-hook.

+FRM=? Return "24, 48, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146"

see +FTM

+FRH= Receives data using HDLC protocol and the defined
<value> modulation .

ERROR is issued if modem is on-hook.

<value> - 3 (V.21 channel 2 300 bps)

+FRH=? Return "3"

+FTH= Transmits data using HDLC protocol and the defined
<value> modulation .

ERROR is issued if modem is on-hook.

<value> - 3 (V.21 channel 2 300 bps)

+FTH=? Return "3"

AT* Commands – Black List Support

Note: The following command will always return OK as a result code.

*B Return Blacklisted numbers

Blacklisting is a country dependent parameter.

When no duration is defined:

When a number is unsuccessfully called x successive times, it is blocked altogether, until next system reset. Further calls will return **BLACKLISTED** code.

When duration is defined:

When a number is unsuccessfully called x successive times, it is blocked temporarily until the time-out expires.

Calls within the time-out period will return **DELAYED** code.

Format:

| No. | Called | Blocked | Phone |
|--------|------------|--|-------|
| Index | # of calls | ' ' (blank) | Phone |
| number | | | |
| | | - not blocked | |
| | | (number still candidate for blacklist) | |
| | | or | |
| | | '*' (asterisk) - blacklisted/blocked | |
| | | or | |
| | | 'Xmin' - # of min to time-out – | |
| | | delayed | |

Example 1: No time-out defined. Full blocking occurs

| No. | Called | Blocked | Phone |
|-----|--------|---------|-------|
| 1 | 5 | * | t1234 |
| 2 | 3 | | t5678 |

Example 2: Time-out defined. Delay scheme used.

| No. | Called | Blocked | Phone |
|-----|--------|---------|-------|
| 1 | 5 | 2min | t1234 |
| 2 | 3 | | t5678 |

AT# Commands - Voice Modem Support

Note: All the following commands will return OK as a result code (or ERROR if the parameters are faulty), unless stated otherwise.

- #BDR=** Sets DTE Baud Rate
<value> <value> - DTE Baud rate (0-48) *2400
- #CID=** Enables the Caller ID feature in any mode
<value> #CID=0 - Disable Caller ID
#CID=1 - Enable Caller ID (Verbose)
#CID=2 - Enable Caller ID (Numeric)
- #RG=** Sets receive gain level (effects the AUDIO IN level)
<value> <value> - 0-7ff
- #TL=** Sets transmit level (effects the AUDIO OUT level)
<value> <value> - 0-7ff
- #CLS=** Same as +FCLASS=<value>
<value> Sets Data/Fax Class1/Voice (0,1,8) mode.
- #VBS** Bits per sample (ADPCM or PCM).
#VBS=<value> [<value> - 4 (ADPCM), 8,16 (PCM)]
#VBS? Returns the current setting
#VBS=? Returns "4,8,16"
Related S-Regs: S76
- #VBT** Sets Beep tone timer for generating tones and DTMF.
#VBT=<value> [<value> - 0-40 (* 1/10 ms)]
#VBT? Returns the current setting
#VBT=? Returns "0-40"
- #VIP** Initializes Voice Parameters
- #VIT** Sets Inactivity timer.
#VIT=<value> [0-255 (* 1/10 ms)]
#VIT? Returns the current setting
#VIT=? Returns "0-255"
Related S-Regs: S19

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#VLS Voice Source selection.
#VLS=<value>
0 - Telephone Line Select (Go on hook)
2 - Speakers
3 - Microphone
4 - Telephone Line Select + Samples routed to/from
Speakers/Mic in TX/RX modes
6 - Speakerphone
#VLS? Returns the current setting
#VLS=? Returns "0,2,3,4,6"
Result codes:
OK n=0, 4, 6
VCON n=2, 3
ERROR Otherwise
(For 0, 4, 6, VCON will be issued upon line
connection)

#VRA Ringback Goes Away Timer (originate).
This value is used during call progress to detect a
voice answer.
This is the interval between ringback ending and voice
answer determined.
#VRA=<value> [0-255 (*1/10 MS)]
#VRA? Returns the current setting
#VRA=? Returns "0-255"

#VRN Ringback Never Came Timer (originate)
This value is used during call progress to detect a
voice answer.
This is the interval without detection of ringback before
voice answer is determined.
#VRN=<value> [0-255 (*1/10 MS)]
#VRN? Returns the current setting
#VRN=? Returns "0-255"

#VRX Go to Voice Receive Mode.
Result codes:
CONNECT Data may be sent
ERROR VLS=0, 4, 6 and line not connected
Note: Any input from the terminal will abort Voice
Receive Mode

| #VSD | Enables/Disables silence deletion (voice receive, ADPCM) (-) #VSD=<value> [0,1 - Disable/Enable] #VSD? Returns the current setting #VSD=? Returns "0,1" | | | | | | | | | | | | | | | | |
|---|---|-----|-------------|---|-------------------------------|---|---------------------------------------|---|---|---|--|---|---------------------------------------|---|---|-----|----------|
| #VSP | Sets Silence Period (voice receive, ADPCM) #VSP=<value> [0-255 (*1/10 ms)] #VSP? Returns the current setting #VSP=? Returns "0,255" | | | | | | | | | | | | | | | | |
| #VSR | Sets Sample Rate (PCM, ADPCM) #VSR=<value> [7200, 11025, 8000] #VSR? Returns the current setting #VSR=? Returns "7200, 11025, 8000" Only 7200 is currently supported | | | | | | | | | | | | | | | | |
| #VSS | Sets Silence Sensitivity (voice receive, ADPCM) (-) #VSS=<value> [0-3] (0-Disable, 3-allow noisy conditions) #VSS? Returns the current setting #VSS=? Returns "0-3" | | | | | | | | | | | | | | | | |
| #VTD | Sets DTMF reporting capabilities in Voice Transmit, Receive, and Voice Online Command Modes. #VTD=<value><value><value> [0-3F] #VTD? Returns the current setting #VTD=? Returns "<0-3F>,<0-3F>,<0-3F>" | | | | | | | | | | | | | | | | |
| Bit Settings | | | | | | | | | | | | | | | | | |
| <table><tr><th>Bit</th><th>Description</th></tr><tr><td>0</td><td>Disable/Enable DTMF detection</td></tr><tr><td>1</td><td>Disable/Enable V.25 1300 Hz detection</td></tr><tr><td>2</td><td>Disable/Enable T.30 1100 Hz detection (Fax)</td></tr><tr><td>3</td><td>Disable/Enable V.25/T.30 2100 Hz detection (Modem)</td></tr><tr><td>4</td><td>Disable/Enable Bell 2225 Hz detection</td></tr><tr><td>5</td><td>Disable/Enable Busy/Dial tone detection</td></tr><tr><td>6-7</td><td>reserved</td></tr></table> | | Bit | Description | 0 | Disable/Enable DTMF detection | 1 | Disable/Enable V.25 1300 Hz detection | 2 | Disable/Enable T.30 1100 Hz detection (Fax) | 3 | Disable/Enable V.25/T.30 2100 Hz detection (Modem) | 4 | Disable/Enable Bell 2225 Hz detection | 5 | Disable/Enable Busy/Dial tone detection | 6-7 | reserved |
| Bit | Description | | | | | | | | | | | | | | | | |
| 0 | Disable/Enable DTMF detection | | | | | | | | | | | | | | | | |
| 1 | Disable/Enable V.25 1300 Hz detection | | | | | | | | | | | | | | | | |
| 2 | Disable/Enable T.30 1100 Hz detection (Fax) | | | | | | | | | | | | | | | | |
| 3 | Disable/Enable V.25/T.30 2100 Hz detection (Modem) | | | | | | | | | | | | | | | | |
| 4 | Disable/Enable Bell 2225 Hz detection | | | | | | | | | | | | | | | | |
| 5 | Disable/Enable Busy/Dial tone detection | | | | | | | | | | | | | | | | |
| 6-7 | reserved | | | | | | | | | | | | | | | | |
| #VTM | Enables timing mark placement. #VTM=<value> [0-10 (* 1/10 ms)] #VTM? Returns the current setting #VTM=? Returns "0-10" | | | | | | | | | | | | | | | | |

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#VTS Generates a tone signal.
#VTS= [x,y,z] | {x,z} | x, ...

[x,y,z]
x represents the first frequency (Hz)
y represents second frequency (Hz)
z represents the duration (in 100 ms units)

{x,z}
DTMF Digits with Variable Duration.
x represents the DTMF digit (0-9,A-D,*,#)
z represents the duration (in 100 ms units)

DTMF Digits, with duration defined by #VBT. This is represented by a value x (non-bracketed) corresponding to a DTMF digit (0-9,A-D,*,#,!).
Note: '!' stands for flash.

#VGT Sets Playback Volume [Default 192]
#VGT=<value> [0-255 (*1/10 ms)]
#VGT? Returns the current setting
#VGT=? Returns "0-255"

#VTX Go to Voice Receive Mode
Result codes:
CONNECT Data may be sent
ERROR VLS=0, 4, 6 and line not connected

#SPK Sets Speakerphone parameters

#SPK=<mute>,<speaker>,<mic>

<mute> 0 Microphone Mute

* 1 Microphone On (default)

2 Room Monitor (mic on Max, Speaker off)

<speaker> 0-15 - 2-30 dB attenuation

* 5 - (Default)

16 - speaker mute

<mic> 0 - 0 dB gain

* 1 - 6 dB gain (Default)

2 - 9 dB gain

3 - 12 dB gain

Note: Speakerphone function may not be supported by some models.

AT#UD Command – Modem Diagnostics Support

#UD Returns diagnostics data

Description

#UD is an action command. It does not take parameters. It shall be the last command in the command line.

In response to this command, the modem report one or more lines of information text as defined below, and terminated by <CR><LF>.

Each information text line is formatted as follows, including one or more key=value pairs:

DIAG <token key=value [[key=value] [key=value]] ...>

| Character | description |
|-----------|--|
| DIAG | 5 characters, hex: 44, 49, 41, 47, 20 |
| < | left angle bracket (less than sign), hex: 3C |
| Token | unique 32-bit hexadecimal string 2A4D3263 |
| Space | space character, hex 20 |
| Key | One or two digit hexadecimal number, see Table 1 |
| = | equal sign, hex: 3D |
| Value | any string as defined below (Tables 1-3, etc.) |
| > | right angle bracket (greater than sign), hex: 3E |

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Table 1 - AT#UD Last Call Status Report Format

| Key | value(s) | Definition |
|-------|------------|--|
| 0 | 2 digits | Diagnostic Command Specification revision number, digit.digit |
| 1 | Table 2 | Call Setup Result code |
| 2 | Table 3 | Multi-media mode |
| 3 | Table 4 | DTE-DCE interfmode |
| 4 | String | V.8 CM octet string, same format as V.25ter Annex A, in quotes |
| 5 | String | V.8 JM octet string, same format as V.25ter Annex A, in quotes |
| 6-F | | Reserved for call negotiation reports |
| 10 | 0-2F | Received signal power level, in -dBm (0-43) |
| 11 | 0-1F | Transmit signal power level, in -dBm (e.g. 0-17) |
| 12 | 0-64 | Estimated noise level, in -dBm (e.g. 10-90) |
| 13 | 0-FF | Normalized Mean Squared error, 100 (0x64) = min inter-symbol distance |
| 14 | 0-3F | Near echo loss, in units of dB (Note 4) |
| 15 | 0-3F | Far echo loss, in units of dB (Note 4) |
| 16 | 0-3F | Far echo delay, in units of ms (Note 4) |
| 17 | 0-FFF | Round Trip delay, in units of ms (Note 4) |
| 18 | Table 5 | V.34 INFO bit map (Note 4) |
| 19-1F | | Reserved for modulation setup and training reports (Note 5) |
| 20 | Table 6 | Transmit Carrier Negotiation Result (Note 6) |
| 21 | Table 6 | Receive Carrier Negotiation Result (Note 6) |
| 22 | 0-1F40 | Transmit Carrier symbol rate (0-8000) in symbol/s |
| 23 | 0-1F40 | Receive Carrier symbol rate (0-8000) in symbol/s |
| 24 | 0-FA0 | Transmit Carrier frequency (0-4000) in Hz (Note 7) |
| 25 | 0-FA0 | Receive Carrier frequency (0-4000) in Hz (Note 7) |
| 26 | 0-FA00 | Initial transmit carrier data rate (0-64000) in bit/s |
| 27 | 0-FA00 | Initial receive carrier data rate (0-64000) in bit/s |
| 28-2F | | reserved |
| 30 | 0-FF | Temporary carrier loss event count |
| 31 | 0-FF | Carrier Rate re-negotiation event count |
| 32 | 0-FF | Carrier Retrains requested |
| 33 | 0-FF | Carrier Retrain requests granted |
| 34 | 0-FA00 | Final transmit carrier data rate in bit/s |
| 35 | 0-FA00 | Final receive carrier data rate in bit/s |
| 36-3F | | reserved |
| 40 | Table 7 | Protocol Negotiation Result (Note 8) |
| 41 | 0-400 | Error Control frame size in bytes |
| 42 | 0-FF | Error control link timeouts in transmission |
| 43 | 0-FF | Error control link NAKs received |
| 44 | Table 8 | Compression Negotiation Result |
| 45 | 0-800 | Compression dictionary size in bytes |
| 46-4F | | reserved |
| 50 | 0-2 | Transmit flow control: 0 = off; 1 = DC1/DC3; 2 = V.24 ckt 106/133 |
| 51 | 0-2 | Receive flow control: 0 = off; 1 = DC1/DC3; 2 = V.24 ckt 106/133 |
| 52 | 0-FFFFFFFF | Transmit characters sent from DTE (Note 8) |
| 53 | 0-FFFFFFFF | Received characters sent to DTE (Note 8) |
| 54 | 0-FFFF | Transmit characters lost (data overrun errors from DTE) (Note 9) |
| 55 | 0-FFFF | Received characters lost (data overrun errors to DTE) (Note 9) |
| 56 | 0-FFFFFFFF | Transmit I-Frame count, if error control protocol running (Note 8) |
| 57 | 0-FFFFFFFF | Received I-Frame count, if error control protocol running (Note 8) |
| 58 | 0-FFFF | Transmit I-Frame error count, if error control protocol running (Note 9) |

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| | | |
|-------|---------|---|
| 59 | 0-FFFF | Received I- Frame error count, if error control protocol running (Note 9) |
| 5A-5F | | Reserved |
| 60 | Table 9 | Termination Cause |
| 61 | 0-FF | Call Waiting event count |
| 62-7F | | Reserved for future versions of this specification |
| 80-FF | | Reserved for manufacturer proprietary keys |

Table 2 - Call Setup Result Codes

| Code | Definition |
|------|--|
| 0 | No previous call (modem log has been cleared since any previous calls) |
| 1 | No dial tone detected |
| 2 | Reorder signal detected, network busy |
| 3 | Busy signal detected |
| 4 | No recognized signal detected (e.g. no signal, or nothing recognizable) |
| 5 | Voice detected * if this is a voice modem operating in voice mode (e.g. +FCLASS=8.0) |
| 6 | Text telephone signal detected (see V.18) |
| 7 | Data Answering signal detected (e.g. V.25 ANS, V.8 ANSam) |
| 8 | Data Calling signal detected (e.g. V.25 CT, V.8 CI) |
| 9 | Fax Answering signal detected (e.g. T.30 CED, DIS) |
| A | Fax Calling signal detected (e.g. T.30 CNG) |
| B | V.8bis signal detected |
| C-F | Reserved |

Table 3 – Multimedia modes

| Code | Definition |
|------|---|
| 0 | Data Only |
| 1 | FAX Only |
| 2 | Voice Only * if voice mode supported (e.g. V.253, IS-101) |
| 9 | Video-telephony, H.324 |
| A | Other V.80 call |

Table 4 – DTE-DCE modes

| Code | Definition |
|------|-----------------------------------|
| 0 | Async data |
| 1 | V.80 transparent synchronous mode |
| 2 | V.80 framed synchronous mode |
| 3-F | Reserved |

Table 5 – V.34 INFO bit report (applicable only to V.34 or V.90 calls)

| bits | Source bits | Definition |
|-------|---------------------------------------|---------------------------------|
| 31-30 | INFO0 bit 20; 0 | |
| 20-29 | INFOc bits 79-88 | |
| 16-19 | INFOc bits 26-29 or 35-38 or 44-47 or | Pre-emphasis field, selected by |

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| | | |
|-------|--------------------------|------------------------|
| | 53-56- or 62-65 or 71-74 | the symbol rate chosen |
| 12-15 | INFOa bits 26-29 | |
| 10-11 | MP bit 50; 0 | |
| 0-9 | INFOa bits 40-49 | |

Table 6 - gsmModulationSchemeActive from 3.7.2/V.58

| Value | Description |
|-------|-------------------------------------|
| 0 | V.17 (G3 Fax call) |
| 1 | V.21 |
| 2 | V.22 |
| 3 | V.22bis |
| 4 | V.23 |
| A | V.32 |
| B | V.32bis |
| C | V.34 |
| E | V.90 Issue 1 (asymmetric) |
| 81 | "K56FLEX™" |
| 82 | "V.FC" |
| 83 | "V.32terbo" |
| 84 | Bell 212A (if modem supports B212A) |
| 85 | Bell 103 (if modem supports B103) |

Table 7 - errorControl Active from 3.5.2/V.58

| Value | Description |
|-------|----------------------------------|
| 0 | Disable/none |
| 1 | V.42 LAPM |
| 2 | V.42 Alternative protocol (MNP™) |

Table 8 - compressionActive from 3.2.2/V.58

| Value | Description |
|-------|-------------|
| 0 | None |
| 1 | V.42bis |
| 80 | MNP5™ |

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Table 9- callCleared

| Value | Description | Notes |
|-------|--------------------------------|---|
| 0 | CauseUnidentified | Call setup issues |
| 1 | No Previous call | |
| 2 | Call is still in progress | |
| 3 | Call Waiting signal detected | |
| 4 | Delayed | Same as value 2A, CallAttemptsLimitExceeded |
| A | NMSInitiatedDialCall | -- Network Management System |
| B | NMSInitiatedLeasedLineRestoral | |
| C | NMSInitiatedRedial | |
| D | NMSInitiatedDialDisconnect | |
| 14 | PowerLoss | DCE |
| 15 | EquipmentFailure | |
| 16 | FrontPanelDisconnectRequested | If there is a front panel with this control |
| 17 | FrontPanelLeasedLineRestoral | |
| 18 | AutomaticLeasedLineRestoral | |
| 19 | InactivityTimerExpired | |
| 1E | cct116RestoralRequest | DTE Interface |
| 1F | cct108isOffInhibitsDial | |
| 20 | cct108turnedOff | This is hangup with &D2 |
| 28 | NoNumberProvided | Prohibited by some national regulations |
| 29 | BlacklistedNumber | |
| 2A | CallAttemptsLimitExceeded | Same as "Delayed", see ETS 300 001 |
| 2B | ExtensionPhoneOffHook | If extension detection supported |
| 2C | CallSetupFailTimerExpired | e.g. S7 timeout |
| 2D | IncomingCallDetected | If incoming call while sending dial command. |
| 2E | LoopCurrentInterrupted | |
| 2F | NoDialTone | |
| 30 | VoiceDetected | |
| 31 | ReorderTone | |
| 32 | SitTone | |
| 33 | EngagedTone | |
| 34 | LongSpaceDisconnect | And if modem program to abort on long space |
| 3C | CarrierLost | Signal Converter |
| 3D | TrainingFailed | |
| 3E | NoModulationinCommon | |
| 3F | RetrainFailed | |
| 40 | RetrainAttemptCountExceeded | |
| 41 | GstnCleardownReceived | |
| 42 | FaxDetected | If this was not a fax call attempt (note 10) |
| 46 | InTestMode | Test |
| 47 | IntrusiveSelfTestInitiated | |
| 50 | AnyKeyAbort | Call Control |
| 51 | DteHangupCommand | If ATH was used to terminate the previous call. |
| 52 | DteResetCommand | If ATZ was used to terminate the previous call. |
| 5A | FrameReject | Error Control |
| 5B | NoErrorControlEstablished | Error control was required |
| 5C | ProtocolViolation | |
| 5D | n400exceeded | |
| 5E | NegotiationFailed | |
| 5F | DisconnectFrameReceived | |
| 60 | SabmeFrameReceived | |

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| | | |
|----|-----------------------|------------------|
| 64 | LossOfSynchronization | Data Compression |
|----|-----------------------|------------------|

V.92 Related Commands

Note: These commands are available starting from driver version 3.20.

+PIG= PCM upstream ignore
<value> +PIG=0 Enable PCM upstream
 +PIG=1 Disable PCM upstream (default)
 +PIG? Returns current setting
 +PIG=? Returns +PIG:(0,1)

+PCW= Call waiting detection enabled
<value> +PCW=0 Enable (default), toggle ring indication on
 call waiting
 +PCW=1 Hang up
 +PCW=2 Ignore v.92 call waiting
 +PCW? Returns current setting
 +PCW=? Returns + +PCW:(0,1,2)

+PMH = Modem on hold enable
<value> +PMH=0 Enable (default)
 +PMH=1 Disable
 + PMH? Returns current setting
 + PMH=? Returns + PMH:0,1

+PMHT +PMHT – Report modem on hold timer values
 This command is for ISP side.

 +PMHT? Returns current setting
 +PMHT=? Returns:
 +PMHT:(0,1,2,3,4,5,6,7,8,9,10,11,12,13)

+PMHF Execute flash sequence

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+PMHR Initiate modem on hold
Returns: +PMHR: <value>

| <value> | Description |
|---------|---|
| 0 | V.92 Modem on Hold Request Denied or not available. The modem may initiate another Modem-on-hold request later. |
| 1 | MOH with 10 second timeout Granted |
| 2 | MOH with 20 second timeout Granted |
| 3 | MOH with 30 second timeout Granted |
| 4 | MOH with 40 second timeout Granted |
| 5 | MOH with 1 minute timeout Granted |
| 6 | MOH with 2 minute timeout Granted |
| 7 | MOH with 3 minute timeout Granted |
| 8 | MOH with 4 minute timeout Granted |
| 9 | MOH with 6 minute timeout Granted |
| 10 | MOH with 8 minute timeout Granted |
| 11 | MOH with 12 minute timeout Granted |
| 12 | MOH with 16 minute timeout Granted |
| 13 | MOH with indefinite timeout Granted |
| 14 | MOH Request denied. Future requests will also be denied during this session. |

Returns error if MOH cannot be initiated.

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+PQC= V.92 phase 1 and phase 2 Control (Quick Connect)
<value>

- +PQC=0** Enable short Phase1 and Phase 2 (default)
- +PQC=1** Enable short Phase1
- +PQC=2** Enable short Phase 2
- +PQC=3** Disable short Phase1 and Phase 2
- +PQC?** Returns current setting
- +PQC=?** Returns: +PQC:(0,1,2,3)

+PSS Use short Sequence

+PSS=0 The modem decides whether or not to use the short startup procedures. The short startup procedures shall only be used if enabled by the +PQC command. (default).

+PSS=1 Forces the use of the short startup procedures on the next and subsequent connections if they are enabled by the +PQC command.

+PSS=2 Forces the use of the full startup procedures on the next and subsequent connections independent of the setting of the +PQC command.

+PSS? Returns current settings

+PSS=? Returns: +PSS:(0,1,2)

S-Registers

The S-Registers are summarized in the following table. Registers denoted with a * may be customized using the PTT Wizard Tool.

Factory defaults

Factory defaults are stored in the Windows OS registry. They are loaded at initialization time or by AT commands (&F,Z). In addition the designated default profile (as specified by the Yn command) is subsequently loaded. The defaults shown are of the Smart Link factory settings 0 and 1.

S-Register Summary

| S# | Function | Range | Units | PW | Default | AT Command |
|-----|---|--------|--------|----|---------|------------|
| S0 | Rings to Auto-Answer | 0-255 | rings | | 0 | A |
| S1 | Ring Counter | 0-255 | rings | | 0 | |
| S2 | Escape Character | 0-255 | ASCII | | 43 | |
| S3 | CR Character | 0-255 | ASCII | | 13 | |
| S4 | LF Character | 0-255 | ASCII | | 10 | |
| S5 | BS Character | 0-255 | ASCII | | 8 | |
| S6 | Wait Time for Dial Tone (Also wait before Blind Dialing) | 2-255 | s | * | 2 | D |
| S7 | Wait Time for Carrier | 1-255 | s | * | 60 | D |
| S8 | Pause Time for Dial (,) | 0-255 | s | | 2 | D |
| S9 | Carrier Detect Response Time | 1-255 | 0.1s | | 6 | |
| S10 | Carrier Loss Disconnect Time | 1-255 | 0.1s | * | 7 | |
| S11 | DTMF Tone duration | 50-255 | 0.001s | * | 100 | D |

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| S# | Function | Range | Units | PW | Default | AT Command |
|-----------|-------------------------|--------------|--------------|-----------|----------------|-------------------|
| S12 | Reserved | | | | | |
| S13 | Echo | 0-1 | | | 1 | E |
| S14 | Quiet | 0-1 | | | 0 | Q |
| S15 | Verbose | 0-1 | | | 1 | V |
| S16 | Pulse/ Tone | 0-1 | | * | 1 | T,P,D |
| S17 | Reserved | | | | | |
| S18 | Test Timer | 0-255 | s | | 0 | &T |
| S19 | System Inactivity Timer | 0-255 | min | | 0 | |
| S20 | Reserved | | | | | |
| S21 | Break Length | 0-9 | 100ms | | 9 | \B |
| S22 | Origin/Answer | 0-1 | | | 0 | |
| S23 | XOFF Character (NA) | 0-127 | ASCII | | 19 | |
| S24 | Flash Timer | 0-255 | 10 ms | | 20 | |