DIN-Rail Modem 56k
Command Overview

Version: 1.4 / 2005-08-08

Order number: 700-751-HSM11

1 Syntax of Standard AT Commands

The modem guideline V.25ter is applicable with regard to the time sequence of interface commands. The **AT** standard is a line-oriented command language. Each command consists of three elements: Prefix, body and end character.

The **prefix** always consists of the letters "**AT**"; the only exception is the command "**A/**".

The **body** consists of individual characters which are described in the following chapter. The body consists of a name and pertinent values, if applicable.

Syntax:

\<expression>	Input of a parameter
\<Pause>	Means a waiting period of one second
[expression]	Optional input of a parameter

The factory settings are marked with "(default)".

The standard end character is "return" (oDh) or "**\<CR>**". "Return" may not be entered after "********" or "**+++**".

Commands can be grouped to one command line. Space characters between the individual main parts are ignored. The commands can be categorized as follows:

- Basic instruction set
- Extended instruction set   (Main part starts with "**+**" or "**^**")

The commands are acknowledged with "**OK**" or "**ERROR**". A command that is being edited will be interrupted by any further incoming character. Therefore, the next command must wait for acknowledgement to avoid the deletion of the current command.

Additional overviews for pure voice function commands are available as separate documents.

1.1 Responses for Normal Data Communication

Response	Code	Type	Meaning
OK	0	Final	Command executed, no error
CONNECT	1	Progress message	Connection established if parameter setting X=0
CONNECT[<text>]		Progress message	Connection established if parameter setting X=0 <text>: E.g. 'connect 9600'. The data transmission rate is then 9.600 bit/s.
RING	2	Non-synchronized	Ring tone recognized
NO CARRIER	3	Final	Connection not established or disconnected
ERROR	4	Final	Invalid command or command line too long
NO DIAL TONE	5	Final	No dial tone, connection setup not successful, wrong operating mode
BUSY	6	Final	Remote terminal busy
NO ANSWER	7	Final	Timeout for connection setup

1.2 Overview AT Commands

Command	Description
AT**	Start of the flash load function
ATA	Answer mode The modem is switched into response mode. This is only effective in Germany, if the connected phone goes off-hook or if a call comes in.
A/	Repeat the last command The last command is repeated.
AT\A<n>	Select maximum MNP block size Define maximum block size for error corrected MNP transmissions. **AT\A0** 64 characters **AT\A1** 128 characters (default) **AT\A2** 192 characters **AT\A3** 256 characters
AT*A<n>	Automatic call acceptance on/off **AT*A0** Call acceptance is blocked, irrespective of S0 **AT*A1** Call acceptance according to S0 (default)
AT%A	Simple alarm release Releases a simple alarm. Corresponds to an activation of the alarm input. The response occurs after the signal has been sent with "**OK**" or "**ERROR**". Note: see also **AT*V**

Command	Description
AT%A\<n>	<u>Triggers a pulse alarm</u> Triggers a pulse alarm. Corresponds to an activation of the alarm input with **n** pulses from 0.3 .. 2 seconds. n=1..10. The response occurs after the signal has been sent with "**OK**" or "**ERROR**". Note: see also **AT*V\<n>**
AT&A\<n>	<u>Selective Call Answer On or Off</u> **AT&A1** Switches the selective call answer on **AT&A0** Switches the selective call answer off (default) Input of permitted numbers with **AT*N** The **AT&A** setting is saved in **AT&W**.
ATB\<n>	<u>CCITT or Bell for connections with 300 bit/s</u> **ATB0** Select CCITT modulation format (default) **ATB1** Select Bell modulation format
AT\\B\<n>	<u>Send "break" to the other modem</u> For connections that were not error corrected the modem sends a break signal to the other modem. The length of the signal is: the specified parameter times 1/10 of a second. For error corrected connections, the modem sends a break signal according to the active error correction protocol without considering a parameter specification. If no connection is established or if a fax connection is active, an error message is displayed. **AT\\B1** 1/10 second break signal to **AT\\B9** 9/10 second break signal
AT%B\<n>	<u>Switch key abort on and off during connection</u> **AT%B0** Key abort is active. Each character on the Tx line will result in an interruption of the connection setup. (default) **AT%B1** Key abort is deactivated. The connection setup cannot be interrupted manually. A connection setup can only be interrupted via DTR drop, Cancel (**NO DIALTONE, BUSY**) or Timeout (**NO CARRIER**). (S-Registry 36 Bit 6)
AT%C\<n>	<u>Enable data compression</u> Enable/disable a data compression type The modem can only perform data compression for error corrected connections. **AT%C0** No data compression enabled **AT%C1** MNP 5 data compression enabled **AT%C2** Enable V.42bis data compression **AT%C3** Enable MNP 5 and V.42bis data compression (default)

Command	Description
AT*C	<u>Remote configuration password</u> This password secures the remote configuration as well as incoming data connections (see **AT*P**) and security callback. **OLD PASSWORD** requires the old password (default setting: QWERTY). Wrong input leads to **ERROR**. **NEW PASSWORD** Enter the new password with 6 to 12 characters. **CONFIRM** repeat the new password. Wrong input leads to **ERROR**. **OK** The password is immediately stored in the EEPROM.
AT*C1	<u>DTMF PIN</u> The PIN consisting of 4 characters secures the access to DTMF switching commands. **OLD DTMF-PIN** requires the old PIN (default setting: 0000). Wrong input leads to **ERROR**. **NEW DTMF PIN** Enter the new PIN (all characters are allowed – use only DTMF characters: "0..9", "A..D"). **CONFIRM** repeat the new PIN Wrong input leads to **ERROR**. **OK** The PIN is immediately stored in the EEPROM.
AT&C\<n>	<u>DCD (CT109) behavior</u> Behavior of the RS232 DCD output of the modem. **AT&C0** DCD always on **AT&C1** DCD follows the carrier signal of the phone line (default)

Command	Description
`ATD<n>`	<u>Dial</u> The modem goes off-hook and dials according to the dialing string transmitted via the `ATD` command. After it dialed, the modem attempts to establish a connection. If the `ATD` command was performed without a dialing string, the modem goes off-hook and attempts to connect to the other modem (without dialing). The behavior of the modem depends on the activation of the line current recognition (see `ATX` command). The execution of the `ATD` command also depends on when the last dialing attempt was performed. In the mode FCLASS=0 the modem acts like a data modem. It attempts to connect to another data modem. This attempt is repeated until the waiting period that was specified in the S7 registry has expired. If this period is exceeded, the modem hangs up and the following error message appears: `NO CARRIER` is displayed. In the modus FCLASS=1 or =2 the modem acts as a fax modem. It attempts to connect to another fax or fax modem. (The modem goes into receive status HDLC V.21 channel 2, as if the command `AT+FRH` had been executed.) The following characters may be transmitted as parameters (brackets, punctuation marks, spaces and semicolons are ignored):

`0 to 9`	The digits from 0 to 9
`*`	The asterisk: Only for tone dialing
`#`	The hash: Only for tone dialing
`A-D`	The inband signaling characters A, B, C, D
`P`	Pulse dialing mandatory: Pulse or tone dialing is required according to the region.
`T`	Tone dialing mandatory: Pulse or tone dialing is required according to the region.
`W`	Wait for dialing tone: The modem waits for the dialing tone before it starts to dial. If no dialing tone was detected within the period specified in the S6 registry, the modem hangs up and an error message is displayed.
`@`	Waiting for silence: The modem waits at least five seconds for silence in the line, before it executes the next character from the parameter string. If this five-second silence cannot be detected and the abort period in the S7 registry has not been exceeded, the modem terminates the connection displaying the message: `NO ANSWER`. If busy signal recognition was activated, the modem terminates the connection displaying the message: `BUSY`. If a response tone from the other modem is received during the waiting period, a connection is established. Dial tone delay: The modem performs a dial tone delay before it executes the next character of the parameter string. The delay length is defined in the S8 registry.

Command	Description	
ATD<n>	**L**	Last number re-dialing.
CONTINUATION	**;**	Return to the input mode after dialing. Is attached to the end of the dialing string. Causes the modem to return to the input mode after reaching the character "**;**" (message: **OK**). This enables the input of **AT** commands even with a receiver off-hook. The additional **AT** commands can follow in the same input line after the ";" or they can be transmitted to further input lines. The **ATH** command will abort the connection and the receiver is hung up.
	S=n	Dialing the n-th number from the number pool, which was set up with the **AT&Z** command.
	!	Flash. If the character ! is a part of the dialing string, the modem will hang up within the time determined in S29 and then goes off-hook again.
	^	Suppresses the sending of a ringing tone.
	ATD12345;	The semicolon (;) causes the return to the input mode after dialing.
		Factory setting: Ringing tone is sent for fax operation. No ringing tone for data operation.
	( )	Are ignored: They are just used as an outline.
	-	Are ignored: They are just used as an outline.
	, ,	Space characters are ignored: They are just used as an outline.
	Examples:	
	ATD12345	Dial the phone number 12345
	ATDP12345	Dial the phone number 12345 with the pulse dialing method
	ATDT12345	Dial the phone number 12345 with the tone dialing method
	ATX3D0W12345	
		For PBXs, which connect to the exchange line using the prefix 0 (or 9): First, blind dialing is activated with :**X3** (see "**ATX3**" command), to be able to dial a leading 0 without hearing a dialing tone. After the 0 has been dialed via :**D0** , dialing tone recognition can be switched on again using the parameter :**W** . The modem thus waits for the dialing tone and continues with the rest of the dial-up (via :12345) only after hearing the dialing tone. Waiting for the dialing tone may be omitted. In this case, the dialing command is **ATX3D012345**.

Command	Description
AT&D\<n>	<u>DTR (CT108/2) behavior</u> DTR (CT108/2) behavior - Monitoring on/off transitions of the RS232 DTR line of the PC. **AT&D0** DTR is ignored. Allows the operation with PCs that do not run DTR. **AT&D1** A DTR on/off transition causes the modem to react as if it had received an abort sequence **+++.** The modem switches to the input mode without hanging up. **AT&D2** A DTR on/off transition causes the modem to hang up. Going off-hook automatically is not possible (default). **AT&D3** A DTR on/off transition causes the modem to perform a reset as if an **ATZ** command had been executed. A preceded **AT&Y** command decides if either the default 1 or 2 is loaded.

AT\D\<n>	<u>DTMF mode activation/deactivation</u>
	
	AT\D1 Switch on DTMF mode
	
	AT\D0 Switch on DTMF mode (default)
	
	When the DTMF mode is activated, the modem will be set into DTMF mode for incoming calls. After the signal **OK**, the modem requires the input of the 4-digit PIN. The PIN input is acoustically acknowledged.
	
	The following commands can be performed via the phone keys:
	
	Key **Meaning**
	
	0* Terminate connection
	
	1*x Control switch output 1
	      x: 1: Set switch output 1
	          0: Reset switch output 1
	      Return: "OK"
	
	2*x Control switch output 2
	      x: 1: Set switch output 2
	          0: Reset switch output 2
	      Return: "OK"
	
	3*x Query of the two alarm inputs:
	      Both alarm inputs are output as HIGH or LOW in succession.
	      Return: "OK" – Status input 1 – Status input 2

Command	Description		
AT\D<n> *CONTINUATION*	**Acoustic response**		**Description**
	Short long tone – short pause PIN ok Short high tone	**OK**	ready, command executed,
	Long low tone	**ERROR**	invalid command, wrong PIN
	High long tone	**LOW**	Alarm input active
		HIGH	Alarm input inactive
	If no DTMF tone is entered for more than 25 seconds, the modem will automatically disconnect.		
	If the INSYS modem recognizes the call tone of a modem that wants to establish a connection, it will immediately switch to data mode.		
AT+DS<n>	<u>Activate/deactivate V.42bis data compression</u> **AT+DS=0** Deactivates V.42bis data compression **AT+DS=3** Activates V.42bis data compression (default)		
AT+DS44=<n>	<u>Activate/deactivate V.44 data compression</u> **AT+DS44=0** Deactivates V.44 data compression **AT+DS44=3** Activates V.44 data compression (default)		
ATE<n>	<u>Command entry Echo</u> This command toggles the responses, which the modem creates as reactions from PC commands (Echo). **ATE0** Switch off Echo **ATE1** Switch on Echo (default)		
AT%E<n>	<u>Automatic Retrain</u> When transmission problems occur, the modem executes a retrain procedure. After three unsuccessful attempts, the modem will hang up. **AT%E0** Retrain not allowed **AT%E1** Retrain allowed **AT%E2** Fall back, fall forward allowed (default) **AT%E3** Fast fall back, fall forward. Is not supported by all modem types.		
AT*E	<u>Terminate remote configuration</u> **AT*E** terminates a remote configuration.		
AT&F	<u>Loading the default factory settings</u> The modem loads the default factory setting from the internal, nonvolatile memory. This puts the modem into a defined basic state. **AT&F** also resets a part of the S registry.		

Command	Description
AT+GCI	Set country code The command **AT+GCI** allows the customization of the modem for different countries. Factory setting: **AT+GCI=FD** to Europe (CTR21). Please find a detailed list of the countries that can be set in Chap. 3. **Note:** Please note that all country settings will result in **ALL** modem settings being reset to the factory settings (such as **AT&F&W**). Therefore, please select a country profile first and adjust the settings afterwards.
ATH	Disconnect connection The modem hangs up.
AT*H<n>	Declaration of the connection protocol speed (MNP 10) **AT*H** determines the speed that is used to exchange the declarations during the MNP10 connection setup before the modems enter the MNP 10 mode. **AT*H0** The connection setup takes place with the highest possible speed (default) **AT*H1** Connection setup takes place with 1,200 bps **AT*H2** Connection setup takes place with 4,800 bps
ATI<n>	Identification The modem sends an identification to the PC, according to the following parameter: **ATI0** Product code **ATI1** Previously calculated EPROM checksum **ATI2** Calculation of the EPROM checksum and comparison with the previously calculated checksum stored in the EPROM. OK for correct comparison. **ATI3** Number of firmware version in the EPROM **ATI4** Modem version number **ATI5** Country code parameter (Germany = 006/Europe = 253) **ATI6** Version number and revision of the "data pump"
AT*I	Manual query of the alarm input Response **<Input 1>,<Input 2>** The response provides the values "1" for inactive (open) and "0" for active (connected to ground)

Command	Description
`AT+IPR=<n>`	<u>Determine baud rate</u> The command `AT+IPR` switches the automatic baud rate detection on and off. `AT+IPR=0` Activates the automatic baud rate detection (default) `AT+IPR=<n>` Sets the modem to the fixed baud rate n. The following baud rates are supported: 300, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600 and 115,200. The setting `AT+IPR` is not saved with `AT&W` , which means that in order to inactivate auto bauding, the command `AT+IPR` must be sent to the modem every time it is switched on.
`AT&K<n>`	<u>Select data flow control between the PC and the modem (handshake)</u> Fax operation default is RTS/CTS. `AT&K0` No data flow control `AT&K3` Select data flow control RTS/CTS (default) `AT&K4` Select data flow control XON/XOFF `AT&K5` Select transparent data flow control XON/XOFF `AT&K6` Select RTS/CTS and XON/XOFF data flow control `AT&K8` Activates the controlled half duplex operation on the serial interface for RS485 In this mode, the CTS signal is deactivated (high), while the INSYS Modem sends data at the serial interface. Thus, the CTS signal can be used as driver release signal for a RS485 driver. The polarity can be set with `AT&R`.
`AT-K<n>`	<u>Extended MNP functions (MNP 10)</u> This command determines if a V.42LAP-M connection can be switched to a MNP 10 connection `AT-K0` Disables switching from V.42 LAP-M to MNP 10 (default) `AT-K1` Enables switching from V.42 LAP-M to MNP 10

Command	Description
`AT\K<n>`	<u>Break control</u> The modem reacts to a break (receive path off for a certain amount of time), which it receives from another modem or from the PC, or from the command `AT\B` according to the parameters.

	1. Situation	In case of a break from the PC during the data connection to another modem:
	`AT\K0`	Modem enters the command mode and sends no break to the other modem
	`AT\K1`	Modem deletes the data buffer and sends a break to the other modem
	`AT\K2`	See `AT\K1`
	`AT\K3`	Modem immediately sends break to the other modem; data buffers are not deleted
	`AT\K4`	See `AT\K0`
	`AT\K5`	Modem inserts break into the data transmitted to the other modem
	2. Situation	During a data connection, the modem was put into command mode by an escape sequence **+++**. In this condition, the command `AT\B` will send a break to the other modem. In this situation, the parameter n will cause the following:
	`AT\K0`	Modem deletes the data buffer and sends a break to the other modem
	`AT\K1`	See `AT\K0`
	`AT\K2`	Modem sends break to the other modem without delay
	`AT\K3`	See `AT\K2`
	`AT\K4`	Modem inserts break into the data transmitted to the other modem
	`AT\K5`	Like `AT\K4` – Return from the online command mode into the data mode via the `ATO` command.
	3. Situation	In the case a break is received from another modem during a connection that has not been error corrected, the parameters cause the following:
	`AT\K0`	Modem deletes the data buffer and sends a break to the PC
	`AT\K1`	See `AT\K0`
	`AT\K2`	Modem sends a break to the PC without delay
	`AT\K3`	See `AT\K2`
	`AT\K4`	Modem sends a break to the PC, which is embedded into the data that was received from the other modem
	`AT\K5`	Like `AT\K4`

Command	Description
ATL<n>	<u>Speaker volume</u> This command regulates the speaker volume (see ATM) **ATL1** Speaker volume low (default) **ATL2** Speaker volume medium **ATL3** Speaker volume high **Note:** The speaker output is optional and is not supported in the standard version.
AT*L<n>	<u>Determines the automatic speed limitation</u> The automatic speed limitation is used to automatically achieve the least possible error rate for connections without error correction. In the factory settings the speed limitation is always switched on (**AT*L0**). If the limitation is switched off (**AT*L1**), the modem will always establish the connection on the phone side with the maximum possible speed (or the speed defined with **AT+MS**), irrespective of the data rate at the serial interface. This means that the INSYS Modem 336 will, for example, always attempt to establish a 33600-baud connection, even if the serial interface is only set to 9600 baud. Without error correction the high speed will obviously lead to higher bit error rates, which is usually disruptive. The automatic speed limitation (**AT*L0**) will limit the speed on the phone side to the speed of the serial interface. It should only be switched off if very low baud rates are employed or if the speed of the serial interface is changed during the connection.
AT%L	<u>Display level of the received signal</u> The value that is reported from the modem equals the already amplified level within the modem, not the phone line level. Large **AT%L** responses imply a low signal level; small values imply a high signal level (009 = -9db, 043 = -43db)
ATM<n>	<u>Speaker control</u> This command regulates when the speaker is active (see command **ATL**). **ATM0** Speaker always OFF **ATM1** Speaker ON during dialing and connection setup (default) **ATM2** Speaker always ON **ATM3** Speaker on during connection setup

Command	Description
AT+MR=<n>	<u>Show modulation type</u> The command "**AT+MR**" enables the display of the modulation type after the message **CONNECT** **AT+MR=0** switches the display function off (default). **AT+MR=1** switches the display function on. The displayed value applies to the sent data **AT+MR=2** switches the display function on. The displayed value applies to the received data If the display function is switched on the modem will display the modulation type and the line speed after the message **CONNECT**. After the message **CONNECT**, the line „**+MCR:**" appears, followed by the modulation type (see command **AT+MS**) and the line "**MRR:**", followed by the line speed. The **AT+MR** command is useful for a connection check.
AT+MS=<n>	<u>Select modulation type</u> **AT+MS** determines the modulation type. The command enables or disables automatic modulation recognition and defines the highest and lowest possible connection speed. The command format is **AT+MS=Modulation, [Automode], [Send: Minbaud, Maxbaud]; [Reception: Minbaud, Maxbaud],** **AT+MS?** Displays the current setting **AT+MS=?** **Displays** a list of possible parameters Default factory setting: depending on the device: V.90 or V.92

Command	Description
AT+MS=\<n\> *CONTINUATION*	**Parameter modulation:** The modulation parameter determines the preferred (automode = 1) or the mandatory (automode = 0) modulation type. The following values are available:

V21	V.21	300
V22	V.22	1200
V22B	V.22bis	2400 or 1200
V23C	V.23	1200
V32	V.32	9600 or 4800
V32B	V.32bis	14400, 12000, 9600, 7200 or 4800
V34	V.34	33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800 or 2400
V90	V.90	56000, 54667, 53333, 52000, 50667, 49333, 48000, 46667, 48000, 46667, 45333, 42667, 41333, 40000, 38667, 37333, 36000, 34667, 33333, 32000, 30667, 29333, 28000
V92	V.92	56000, 54667, 53333, 52000, 50667, 49333, 48000, 46667, 48000, 46667, 45333, 42667, 41333, 40000, 38667, 37333, 36000, 34667, 33333, 32000, 30667, 29333, 28000
B103	Bell 103	300
B212	Bell 212	1200/75

Parameter Automode*:*

The optional parameter automode determines whether the modem automatically adjusts to the desired modulation type. The following values may be used:

0	Automatic modulation adjustment switched off
1	Automatic modulation adjustment switched on

Parameter Reception Minbaud:

The optional parameter minbaud determines the lowest possible baud rate for modem reception.

Parameter Reception Maxbaud:

The optional parameter maxbaud determines the highest possible baud rate for modem reception.

Parameter Send Minbaud:

The optional parameter minbaud determines the lowest possible baud rate for modem sending.

Parameter Send Maxbaud:

The optional parameter maxbaud determines the highest possible baud rate for modem sending.

Command	Description
`AT*M<n>`	<u>Remote terminal selection</u> Defines the protocol that is used to send the alarm string to the network provider. `AT*M0` — The remote terminal is a normal fixed network modem (default) `AT*M1` — The remote terminal is a mobile phone with network access via PET/IXO/TAP protocol and data format 8N1 (e.g. D1 and E networks in Germany) `AT*M2` — The remote terminal is a mobile phone with network access via EMI/UCP protocol and data format 7E1 `AT*M3` — The remote terminal is a mobile phone with network access via PET/IXO/TAP protocol and data format 7E1 `AT*M4` — The remote terminal is a mobile phone with network access via EMI/UCP and data format 8N1 (e.g. D2 network in Germany) `AT*M5` — The remote terminal is a fax machine `AT*M6` — Fixed network SMS: The SMS gateway (e.g. Deutsche Telekom via phone number `01930100`) is not tied to a certain mobile phone network, but send SMS to any mobile or fixed network phone. **Note:** — For the remote terminals `AT*M1` to `AT*M4`, only recipients in the network of *one* GSM provider may be addressed. Your network provider will inform you about the current requirements to send SMS to mobile phones. Relevant commands: `AT*V, AT*Vn` Definition of messages/phone numbers `AT*Z0` Definition of the SMS service center
`AT*N<n>=<nr>`	<u>Permitted numbers for selective call acceptance</u> Definition of 8 authorized phone numbers, for which modem access is permitted. Only if the transmitted phone number matches a phone number that was entered in the list will the modem report RING for an incoming call or will accept the call according to the settings in S0 (the line RI is activated with each call, irrespective of that fact). The selective call acceptance is switched on and off with `AT&A`. `AT*N<n>=<nr>` `<n>` — describes the storage location – range of values: 0..7 . `<nr>` — permitted phone number consists of numbers and the wild card "*" for exactly one character. The phone number may not contain separators such as brackets or space characters. After they were entered, the phone numbers are immediately saved in the power fail-safe memory of the modem. `AT*N99=` — deletes all existing entries in the list `AT*N?` — displays all stored entries Example: — `AT*N0=01234567**` permits all calls from the block of numbers 01234567-00 to 01234567-99
`AT*<N>99=`	<u>Delete the list of permitted phone numbers for the selective call answer</u> The command `AT*N99=` deletes the entire list of phone numbers for the selective call answer.

Command	Description
AT*N?	<u>Output of the list of permitted phone numbers</u> **AT*N?** activates the output of the entire saved list of permitted phone numbers for the selective call answer.
AT%N	<u>Output of the last rejected phone number</u> For active selective call answer (**AT&A1**) , the last phone number, whose call was rejected, will be displayed. This phone number is not saved in the power fail-safe memory of the modem.
AT\N<n>	<u>Select error correction</u> This command determines which type of error correction should preferably be used for subsequent connections. **AT\N0** error correction switched off **AT\N1** bit direct mode Transparent transmission of any data width via the serial interface without data buffering or error correction. The modem will evaluate the escape sequence (+++) up to 11-bit data width. **AT\N2** Selects V.42LAP-M or MNP 4 error correction. If no error corrected connection can be established, the modem will hang up. **AT\N3** Selects V.42LAP-M or MNP 4 error correction. If such a connection cannot be established, the modem will attempt to establish a connection that is not error corrected (default): **AT\N4** Exclusively selects a V.42 LAP-M connection. **AT\N5** Exclusively selects a MNP 4 connection.
ATO<n>	<u>Return to online data mode</u> If the modem is in online command mode, it will return to online data mode. If the modem is in offline command mode, it will report **ERROR**. **ATO0** Return to online data mode **ATO1** Before the modem switches to online data mode, a retrain procedure is provoked.
ATP	<u>Switch on pulse dialing method (deactivated for some models)</u> Starting with this command, each dial-up is performed with the pulse dialing method, until an **ATT** or **ATDT** command switches it back to tone dialing.
AT*P<n>	<u>Password query</u> **AT*P0** switches the password query off after the connection has been established (default): **AT*P1** switches the password query on after the connection has been established. If the password query is activated, the modem will query the password after **CONNECT** has taken place. After the password has been entered correctly, the actual **CONNECT** will take place and data may be transmitted. If a wrong password was entered, the modem will hang up. The password is the same as for remote control and is set with **AT*C** .
ATQ<n>	<u>Quiet control</u> This command toggles sending messages from the modem to the PC on and off. **ATQ0** Send messages to PC (default) **ATQ1** Don't send messages to PC

Command	Description
AT%Q	<u>Display telephone call quality</u> Displays the quality of the data connection (deviation from the eye diagram). Low values indicate a good line quality. The line quality value must be evaluated differently depending on the negotiated data rate. Connections with more than 9600 baud will reach the value "000" for good lines and should not have values of more than "010". For connections with 33600 baud good lines will have values between 010…030. Depending on the settings and the modulation type a fall back or retrain is triggered if the line quality is too bad to enable a new negotiation of the connection (if necessary with a slower speed). High values indicate bad quality. These values are constantly updated during a connection. If the value increases significantly during a connection, the quality will deteriorate. After a previous **AT%E** command, an *Autoretrain* is performed.
AT&R\<n\>	<u>RTS/ CTS behavior</u> This command determines how the modem treats the RTS/CTS (CT105/CT106) data flow control lines. (See also command **AT&K**). **AT&R0** CTS behavior complies with V.25bis. CTS is deactivated during the connection setup after recognition of the response or ringing tones and will only be activated after the connection is set up. During the controlled half duplex operation (**AT&K8**) CTS is active, if the modem sends data at the serial interface. When data is received at the serial interface, CTS is inactive. **AT&R1** CTS only switches to *off* when this is required by the data flow control. During the controlled half duplex operation (**AT&K8**) CTS is inactive, if the modem sends data at the serial interface. When data is received at the serial interface, CTS is active (default):
AT*R\<n\>	<u>Switches the remote control on and off</u> **AT*R0** switches the remote control off **AT*R1** switches the remote control on (default)
ATS\<n\>	<u>Read/write of the S registry</u> Some S registries may only be modified within certain limits. The modem still reports **OK** although the value has not changed as specified. Certain registries are read-only. We recommend checking the results after each write attempt using the **ATS\<n\>?** command. **ATS\<n\>=x** Sets the S registry n to the value x. **ATS\<n\>?** Shows the value of the S registry n

Command	Description
`AT&S<n>`	<u>DSR behavior</u> This command determines how the modem treats its DSR (CT107) output. `AT&S0` DSR always on (default) `AT&S1` DSR *on* after a response tone has been detected; DSR *off* when no carrier is detected any more.
`AT*S<n>`	<u>Selects the transmission speed at the serial interface.</u> With this command the speed can be preselected. This will, however, not switch off the automatic detection. As soon as an `AT` is recognized, the serial interface will set itself to the recognized speed and protocol. If no `AT` is sent, the selected speed is maintained until a hardware reset is performed. If the selected speed should be maintained longer, it must be stored with `AT&W`. Attention: This command will not change the registry S23! It only changes if the automatic speed detection is used. `AT*S0` maintain the current speed. `AT*S1` 300 bps `AT*S2` 600 bps `AT*S3` 1,200 bps `AT*S4` 2,400 bps `AT*S5` 4,800 bps `AT*S6` 9,600 bps `AT*S7` 19,200 bps `AT*S8` 38,400 bps `AT*S9` 57,600 bps `AT*S10` 115,200 bps
`AT%S<n>`	<u>Ability to switch between DCD and DSR lines</u> `AT%S0` The DSR signal is on the DSR line The DCD signal is on the DCD line (Default factory setting) `AT%S1` The DSR signal is on the DCD line The DCD signal is on the DSR line (Interchangeability of the lines)
`ATT`	<u>Switching on tone dialing</u> Starting with this command, each dial up is performed with the tone dialing method, until an `ATP` or `ATDP` command switches it back to pulse dialing.
`AT-TRV`	<u>Phone Line Voltage Measurement (Tip Ring Voltage)</u> Use the command `AT-TRV` to measure the phone line voltage (Tip Ring Voltage). The result is yielded in volt. For an existing connection the voltage range will be 5V – 12V. Otherwise the voltage is higher than 20V. If the voltages are lower than 2V, no phone line is connected.

Command	Description
`AT*U<n>`	<u>Selects the protocols at the serial interface.</u> With this command the protocol can be preselected. This will, however, not switch off the automatic detection. As soon as an `AT` is recognized, the serial interface will set itself to the recognized speed and protocol. If no `AT` is sent, the selected protocol is maintained until a hardware reset is performed. If the selected protocol should be maintained longer, it must be stored with `AT&W.` Attention: This command will not change the registry S23! It only changes if the automatic speed and protocol detection is used. `AT*U0` 8 data bits, no parity, 1 stop bit `AT*U1` 7 data bits, odd parity, 1 stop bit `AT*U2` 7 data bits, even parity, 1 stop bit `AT*U3` 7 data bits, no parity, 1 stop bit `AT*U4` 7 data bits, odd parity, 2 stop bits `AT*U5` 7 data bits, even parity, 2 stop bits `AT*U6` 7 data bits, no parity, 2 stop bits `AT*U7` 8 data bits, odd parity, 1 stop bit `AT*U8` 8 data bits, even parity, 1 stop bit `AT*U9` 8 data bits, no parity, 2 stop bits
`ATV<n>`	<u>Format of modem messages</u> This command determines if the modem transmits messages to the PC in short or long format. `ATV0` Messages to PC in short format, i.e. only the error number (default) `ATV1` Messages to PC in long form, i.e. the error text
`AT\V<n>`	<u>Format of connect rate messages</u> This command enables the display of the connect message in one (`\V1`) line or in three lines (`\V0`) *****.
`AT*V`	<u>Definition of the common alarm texts (collective message)</u> for simple alarm: Definition of the alarm text (maximum of 160 characters) for pulse alarm: Definition of the common part of the alarm message (maximum of 160 characters – within HSComm limited to 120 characters) To the input `AT*V` the modem responds with `NEW TEXT:` and expects the input of the alarm text (completed with `<CR>`) This command is not available in the remote operation mode. Relevant commands: `AT*V, AT*V<n>` Definition of messages/phone numbers `AT*Z0` Definition of the SMS service center
`AT*V?`	<u>Query of the common alarm texts (collective message)</u> The common part of the alarm message is queried with the command `AT*V?`.

Command	Description
AT*V\<n\>	<u>Definition of the variable alarm texts and phone numbers</u> Definition of the 10 variable alarm texts and phone numbers for the SMS dispatch for an input of n=1..10 pulses. The common part of the alarm message **(Collective message)** is defined with **AT*V**. After this command is activated, the modem will query the alarm text. To the input **AT*V1** to **AT*V10** the modem responds with **NEW TEXT:** and expects an input in the form **phone number,message\<CR\>** **Phone number** Enter without characters for accessing the exchange (only required for service number) **Message** Alarm message (maximum of 80 characters) For the transmission, the variable part (maximum of 80 characters) will be attached to the common part (maximum of 160 characters) of the collective message. Of the maximum of 240 characters, the first 160 characters are sent as SMS. This command is not available in the remote operation mode. Relevant commands: **AT*V, AT*V\<n\>** Definition of messages/phone numbers **AT*Z0** Definition of the SMS service center
AT*V\<n\>?	<u>Query of the variable alarm texts and phone numbers</u> The variable part of the alarm message and the target phone number are queried with **AT*V\<n\>?**

Command	Description
AT&V\<n\>	<u>Display configurations</u> **AT&V0** The active configuration of the modem, the saved user defaults and the saved phone numbers 0 to 3 (the parameter 0 may be omitted) are displayed **AT&V1** Displays the diagnostic data of the last connection (connection partner, reason for disconnect). **TERMINATION REASON:** Reason for termination. For example manually with the command **ATH**: "**LOCAL REQUEST**". **LAST TX rate:** Last baud rate at the phone line in send direction, prior to the termination. **HIGHEST TX rate:** Highest baud rate that was achieved at the phone line in send direction, prior to the termination. **LAST RX rate:** Last baud rate at the phone line in receive direction, prior to the termination. **HIGHEST TX rate:** Highest baud rate that was achieved at the phone line in receive direction, prior to the termination. **Note:** The data rates may vary if a fall forward, fall back or retrain occurred during the connection. To impact the negotiated data rate, use the command **AT+MS**. **PROTOCOL:** Displays the used error correction protocol. "**LAPM**" equals a V.42 secured connection. For "**NONE**", the connection was not error corrected (the error corrected can be influenced with the command **AT\N**). **COMPRESSION:** Displays the used data compression method. The example shows the used compression method V.42bis (the compression method can be set with the command **AT%C**). **LINE QUALITY:** Displays the quality of the data connection (deviation from the eye diagram). Low values indicate a good line quality. The line quality value must be evaluated differently depending on the negotiated data rate. Connections with more than 9600 baud will reach the value "000" for good lines and should not have values of more than "010". For connections with 33600 baud good lines will have values between 010…030. Depending on the settings and the modulation type a fall back or retrain is triggered if the line quality is too bad to enable a new negotiation of the connection (if necessary with a slower speed). **Rx LEVEL:** Displays the receive level (which is internally applied at the modem chip) in –dBm. High values indicate a low input level, low values indicate a high input level. The optimum receive levels range from approx. 012 to 028. To high levels could cause distortions; too low levels will cause the line noise to have a negative impact on the connection quality. **Local Rtrn Count:** Number of retrains (renegotiation of the connection), triggered by the local modem. **Remote Rtrn Count:** Number of retrains (renegotiation of the connection), triggered by the remote modem.

Command	Description
`AT+VCID=<n>`	<u>Set caller ID</u> With this function, the phone number of the caller can be displayed during an incoming call. (only for phone connections or phone units which support caller ID. If you want to use caller ID, please ask your network provider, if your connection supports caller ID) `AT+VCID=0` switches the caller ID function off. (default) `AT+VCID=1` switches the caller ID function on and displays the ID preformatted for incoming calls. `AT+VCID=2` switches the caller ID function on and displays the ID unformatted for incoming calls.
`AT+VRID=<n>`	<u>Set last received caller ID</u> The command `AT+VRID` displays the caller ID of the last caller. `AT+VRID=0` displays the ID preformatted. `AT+VRID=1` displays the ID unformatted.
`ATW<n>`	<u>Error correction messages</u> This command determines which data transmission rate information is provided for a CONNECT message. `ATW0` The modem reports the baud rate between modem and PC (default). `ATW1` During the connection setup, the modem reports the phone line speed, the error correction protocol and the PC baud rate. `ATW2` The modem reports the phone line speed.
`AT&W<n>`	<u>Save configuration</u> The command saves the current modem configuration including the S registry in one of the two user-defined defaults. `AT&W0` Save in user default 0 `AT&W1` Save in user default 1

Command	Description
ATX<n>	<u>Extended result messages, dial tone detection</u> The command determines which group of messages the modem sends to the PC. This is important for PBXs, as often a leading 0 or 9 must be dialed before a dialing tone is heard on the line. *Blind dialing* (dialing without detecting the dialing tone) is activated or deactivated according to the parameter. The detection of the dialing tone, however, can always be enforced using the parameter W in the **ATD** dialing string (see command **ATD**). In the mode **AT+FCLASS=1,2,** the modem always sends the message **CONNECT** to the PC without specifying the transmission speed.
	ATX0 No detection of the dialing tone, i.e. an unsuccessful dialing attempt leads to the message **NO CARRIER.** No detection of the busy signal, i.e. when calling a busy line the message **NO CARRIER** is displayed. The message is displayed without specifying the speed.
	ATX1 As **ATX0**, but the **CONNECT** message contains the speed specification.
	ATX2 Dialing tone detection is active, i.e. a dialing attempt without the presence of a dialing tone leads to the message **NO DIALTONE.** No detection of the busy signal, i.e. when calling a busy line the message **NO CARRIER** is displayed.
	ATX3 No detection of the dialing tone, i.e. an unsuccessful dialing attempt leads to the message **NO CARRIER.** Busy signal detection active, i.e. when calling a busy line the message **BUSY** is displayed.
	ATX4 Dialing tone detection is active, i.e. a dialing attempt without the presence of a dialing tone leads to the message **NO DIALTONE.** (default) Busy signal detection is active, i.e. when calling a busy line the message **BUSY** is displayed.
AT*X	<u>Terminate remote configuration</u> The command **AT*X** terminates a remote configuration.
AT&Y<n>	<u>Selection of user configuration for hardware reset</u> **AT&Y0** For a hardware reset following the **AT&Y0**-command, the user default 0 (created using the **AT&W0** command) is loaded into the current modem configuration (default). **AT&Y1** For a hardware reset following the **AT&Y1**-command, the user default 1 (created using the **AT&W1** command) is loaded into the current modem configuration.
AT*Yx,y	<u>Switch outputs</u> **x:** Port (OUT1=0, OUT2=1) If no port is specified (x), OUT1 is used **y:** Desired condition of the output (relay open =0, relay closed =1) Factory setting: **AT*Y0,0** **AT*Y1,0**

Command	Description
ATZ\<n>	<u>Software reset/load default</u> The command causes the modem to perform a software reset. The modem will load the default saved by the user (according to the parameter). If no parameter is specified, the user default 0 is loaded. **ATZ0** Software reset; afterwards the user default 0 is loaded. **ATZ1** Software reset; afterwards the user default 1 is loaded. **Note:** If the command is executed during an existing connection, the modem will terminate this existing connection and then execute the RESET!

AT&Z\<n>	<u>Save phone numbers</u>
	
	The command saves four entries permanently in the EEPROM. Each entry may consist of up to 35 characters. The entries may be overwritten and must comply with the dialing string as described in the ATD command.
	
	AT&Z\<n>=xxx **n** is the number of the list entry (from 0 to 3).
	        xxx is the dialing string with the phone number.
	
	Layout of the alarm functions and security callback:
	
	AT&Z0=xxx Number of the modem or fax for a simple alarm message
	              Service center number of the GSM provider for SMS access
	
	AT&Z1=xxx Enter the password into the modem that calls back
	
	AT&Z2=xxx Number of the mobile phone for simple alarm messages
	
	AT&Z3=xxx Number of the fax machine for collective alarm messages

\<Pause> **+++** \<Pause>	<u>Change from data mode to command mode (online command mode).</u> 1 second pause before and after the entry, no **\<CR>.** After the response OK, an additional waiting period of 1 second for the re-entering of AT commands must be observed.
\<Pause> ******** \<Pause>	<u>Start of the remote configuration at the local modem</u> 1 second pause before and after the entry, no **\<CR>.** After the response OK, an additional waiting period of 1 second for the re-entering of AT commands must be observed.

2 S Registry

S registries may be read and written using the **ATS** command. (See Chapter 5 "AT command set", command **ATS**) Certain S registries may only be read; into others only a particular range of values may be entered.

If the range of values is exceeded, the modem will report **OK**, although the value was not accepted. We therefore recommend to immediately check the modifications by reading (**ATS<n>?**).

Note:

* These registries are stored in the user defaults with **AT&W0** or **AT&W1**.

2.1 Overview S Registry

Register	Function	Units	Range	Default
S0*	Number of ringing tones until automatically going off-hook	Ringing tones	0-5	5
S1	Ringing tone counter	Ringing tones	0-255	0
S2*	Escape	ASCII	0-255	43
S3	Return	ASCII	0-127	13
S4	Linefeed character	ASCII	0-127	10
S5	Backspace character	ASCII	0-255	8
S6*	Waiting period dial tone	s	4-7	4
S7*	Waiting period carrier signal	s	0-100	60
S8*	Dial tone delay	s	1-7	2
S9*	Reaction time carrier signal	0.1 s	1-255	6
S10*	Time period between lost carrier signal and hang up	0.1 s	20-254	20
S11*	Data Transmit Controller DTC (144/336)	1s	0-255	0
S12*	Transmission clock of the ESC characters	0.02 s	0-255	50
S13*	Number of dialing attempts to send the message		1-12	3
S14*	General settings			138
S15*	Data Transmit Controller DTC (56k)	1s	0-255	0**
S17*	Initial character for remote configuration		0-127	42
S21*	Settings for V24			116
S22*	Settings			75h (117)
S24*	Time period until switching into sleep mode	s	0-255	0
S25	Time period for DTR signal	0.01 s	0-255	5
S26	Time period between RTS/CTS	0.01 s	0-255	1
S27*	General settings	-		137

Register	Function	Units	Range	Default
S29	Time period for modifier "flash"	10 ms	17	17
S30	Time period until hang up due to silence	10 s	0-255	0
S31*	General settings	-		C2h (194)
S36*	Reset of error logs	-		135
S38	Time period until forced hang up	s	0-255	20
S39*	Flow control	-		3
S40*	General settings	-		104
S41*	General settings	-		195
S46*	Data Compression	-		138
S48*	Setting for V42 declaration phase	-		7
S86	Error event code	-		Read-only
S91*	Transmit Level	-	0-15	9
S95*	Result code	-		0

2.2 Description S Registry

S0* <u>Rings to Auto Answer:</u>

Number of rings until the modem goes off-hook

For S0=0 the modem will not go off-hook when a call comes in. The value of S0 can be between 0 and 5.

S1 <u>Ring Counter</u>

Counter for call ringing. S1 is read-only. S1 will be reset to zero when the modem answers a call.

S2* <u>Escape Character</u>

Escape character which causes a switch from data mode to online command input mode. Values larger than 127 will lead to the fact that no ESC character will be recognized.

S3 <u>Carriage Return Character</u>

Carriage Return Character

S4   Linefeed Character

Linefeed character

S5   Backspace Character

Backspace character

S6*   Wait Time for Dial Tone (Before Blind Dialing)

Maximum waiting time for the dialing tone. After the modem went off-hook it waits 7 seconds for the dialing tone (fixed for approval purposes). If it detects a dialing tone during this waiting period it will start dialing.

If no dialing tone is detected, it will check if the dialing tone detection has been activated or if the dial string (Chap. „AT Command Set", command **ATD**) includes the parameter W. If the dialing tone detection is not active, the modem waits for the dialing tone. The waiting time is specified in S6.

The value of S6 can be between 4 and 7.

S7*   Wait for Carrier

Wait for the carrier frequency from the other modem. The maximum time for the modem to wait for a response from the other modem is specified in S7. The time starts running as soon as the modem has finished dialing. The value of S7 can be between 0 and 180 seconds.

S8*   Pause Time for Dial Delay Modifier

Dial pause time, if a comma is included in the dialing string. If a comma is included in the dialing string, the modem will wait during the dialing procedure until the time specified in S8 (in seconds) has run out. The value of S8 can be between 1 and 7 seconds.

S9*   Carrier Detect Response Time

DCD response time for the carrier frequency from the other modem. The DCD output of the RS232 interface (CT109) of the modem switches to on, when the carrier frequency from the other modem is detected before the time defined in S9 (in tenth of seconds) runs out. S9 must be smaller than S10.

S10*   Carrier Loss Disconnect Time

The time which leads to termination after carrier frequency loss. In S10, the time is specified in tenth of seconds, which the modem awaits to disconnect, if it can't detect the carrier frequency from the other modem anymore.

S12* <u>Escape Prompt Delay</u>

Minimum pre and post run time and maximum interim time in tenth of seconds between two characters. This must be observed, if the modem is supposed to detect an abort sequence (usually +++).

S13* <u>Number of dialing attempts to send the message</u>

Bit	Meaning	
Bit 0-3	Number of dialing attempts	Range of values: 1...12 Default value: 3 S13 determines the number of attempts to send the message. **Note:** The limitation to a maximum of 12 attempts is necessary for approval purposes (black listing).
Bit 4-7	Reserved	

S14* <u>General Bitmapped Options Status – General settings</u>

Bit	Meaning		
Bit 0	Reserved		
Bit 1	Echo on inputs	Command echo	0: Echo off 1: Echo on
Bit 2	Reserved		
Bit 3	Result format	Result codes:	0: Message numbers (**ATV0**) 1: Message texts (**ATV1**)
Bit 4	Reserved		
Bit 5	Tone/pulse dialing	Tone/pulse	0: Tone dialing (**ATT**) 1: Pulse dialing (**ATP**)
Bit 6	Reserved		
Bit 7	Originate/answer	Originate/answer	0: Answer mode 1: Originate mode

S15* DRC Time Settings

The idle connection control is a function integrated in the firmware that monitors the data transmission in online mode. This function prevents the modem to stay online for an unlimited amount of time, although no data is being transmitted anymore.

In the registry S15, any time period between 1 and 255 seconds may be entered. If S15 is set to 0, the idle connection control is switched off.

The timer will run immediately after the modem goes off-hook. As soon as the timer has run out, a modem reset is performed (which will forcibly lead to the hanging up of the modem).

S17* Initial character for remote configuration

In S17, the ASCII code of a character which is used to start the remote configuration, is defined. Values >127 switch the remote configuration off completely. The default setting in S17 is "42", which equals the ASCII character "*". This means that the remote configuration is started with the Escape character sequence

`<Pause> **** <Pause>.`

(**Note:** The number of characters in the Escape sequence is fixed to "4" characters).

S21* General Bitmapped Options Status – Settings for V24

Bit	Meaning	
Bit 0.1	Reserved	
Bit 2	CTS behavior	CT106 (CTS) behavior: 0: see AT\K0 1: see **AT&R1**
Bit 3-4	DTR behavior	CT108 (DTR) behavior: 0: see **AT&D0** 1: see **AT&D1** 2: see **AT&D2** 3: see **AT&D3**
Bit 5	DCD behavior	CT109 (DCD) behavior: 0: see **AT&C0** 1: see **AT&C1**
Bit 6	DSR behavior	CT107 (DCD) behavior: 0: see **AT&S0** 1: see **AT&S1**
Bit 7	Long-term interruption	Long space disconnect: 0: see **ATY0** 1: see **ATY1**

S22* Bitmapped Options Status

Bit	Meaning	
Bit 0.1	Speaker volume	Speaker volume: 0: Off (**ATL0**) 1: Silent (**ATL1**) 2: Medium (**ATL2**) 3: Loud (**ATL3**)
Bit 2-3	Speaker control	Speaker control: 0: Off (**ATM0**) 1: On until carrier (**ATM1**) 2: Always on (**ATM2**) 3: On at establishing (**ATM3**)
Bit 4-6	Error message group	Limit result codes: 0: see **ATX0** 4: see **ATX1** 5: see **ATX2** 6: see **ATX3** 7: see **ATX4**
Bit 7	Stores the setting of **AT*L**	

S24* Sleep Timer:

The time after which the modem switches to energy saving mode (sleep) during inactivity is determined (in seconds) in S24. The energy saving mode will be quit as soon as characters are sent to the modem, or when a call comes in.

Note: The first "**AT**" ends the sleep mode, but is not recognized positively. When the modem is in sleep mode, it is necessary to send an "**AT**" command before sending other commands. This first "**AT**" command may not be answered with "OK".

S25 Delay to DTR Off:

Time period, in which a DTR signal is applied to the modem before it hangs up (in hundreds of seconds).

S26 RTS to CTS Delay

Time period between RTS and CTS activation in 1/100 seconds.

S27*   General Bitmapped Options Status – General settings

Bit	Meaning	

Bit 0-3	RS232-Mode	Asynchronous Mode Selection:
		        0: see **AT&M0** or **AT&Q0**
		        9: see **AT&Q5**
		        10: see **AT&Q6**

Bit 4.5	Reserved	

Bit 6	CCITT or Bell Modulation	CCITT/Bell Select
		        0: CCITT Modulation
		        1: Bell Modulation

Bit 7		Remote control
		        0: Remote control off
		        1: Remote control on

S29   Flash Dial Modifier Time:

Sets the time period in tenths of seconds, after which the modem hangs up due to a flash in the dialing string.

S30   Disconnect Inactivity Timer:

Time period, in which the modem waits without activity before hanging up. Units in seconds (only for FAX Class 1).

S31*   General Bitmapped Options Status – General settings

Bit	Meaning	
Bit 0		
Bit 1	Description Connect message	0: 3-line message (**\V0**) 1: Expanded 1-line message (**\V1**)
	Error correction Messages	Messages: 0: Only PC baud rate 1: PC and phone baud rate (**ATW1**) 2: Only phone baud rate (**ATW2**)
Bit 4-7	Reserved	

S36* LAPM Failure Control

Bit	Meaning		
Bit 0..2	Determines what happens if an attempt to establish a V.42 LAP-M connection fails. It is connected to the registry S48.	0	Modem hangs up
		1	Modem stays online and establishes a direct mode connection.
		2	Reserved
		3	Modem stays online and establishes a direct mode connection.
		4	Modem attempts to establish a MNP connection. In case of failure it hangs up.
		5	Modem attempts to establish a MNP connection. In case of failure a direct mode connection is established.
		6	Reserved
		7	Modem attempts to establish a MNP connection. In case of failure a normal mode connection is established.
Bit 3...4	SMS type	0:	normal fixed network modem (**AT*M0**)
		1:	D1 and E networks (**AT*M1**)
		2:	D2 network (**AT*M4**)
		5:	Fax (**AT*M5**)
Bit 6	Key abort	0:	Key abort activated
		1:	Key abort deactivated
Bit 7		1:	Call answer not locked (**AT*A1**)
		0:	Call answer locked (**AT*A0**)

S38 Delay Before Forced Hang-up

Maximum time left for the buffers to empty their data, after a command to hang up has been received. Only applies to error corrected connections.

S39* PC / Flow Control Modem

Selection of the data flow control between the PC and the modem

S39=0 No data flow control (**AT&K0**)

S39=3 RTS/ CTS data flow control (**AT&K3**)

S39=4 XON/ XOFF data flow control (**AT&K4**)

S39=5 Transparent XON data flow control (**AT&K5**)

S39=6 RTS/CTS and XON/XOFF data flow control

S40* General Bitmapped Options Status – General settings

Bit	Meaning	
Bit 0	Reserved	
Bit 1	Reserved	
Bit 2	Reserved	
Bit 3-5	Break handling	Break handling 0: see **AT\K0** 1: see **AT\K1** 2: see **AT\K2** 3: see **AT\K3** 4: see **AT\K4** 5: see **AT\K5**
Bit 6-7	MNP block size	MNP block size 0: 64 characters (**AT\A0**) 1: 128 characters (**AT\A1**) 2: 192 characters (**AT\A2**) 3: 256 characters (**AT\A3**)

S41* General Bitmapped Options Status – General settings

Bit	Meaning	
Bit 0.1	Select compression type	Compression Selection 0: No compression (**AT%C0**) 1: MNP5 (**AT%C1**) 2: V42bis (**AT%C2**) 3: MNP5 or V.42bis (**AT%C3**)
Bit 2	Auto retrain	Auto retrain control 0: No auto retrain (**AT%E0**) 1: Auto retrain (**AT%E1**)
Bit 3	Reserved	
Bit 4	MNP block mode reserved for 56k models	Block Mode Control MNP 0: reserved 1: Block mode (**AT\L1**)
Bit 5	Reserved	
Bit 6	Fall back/fall forward	FB/FF control 0: No FB/FF 1: FB/FF (**AT%E2**)
Bit 7	Reserved	

S46* V.42bis Data Compression

S46=136   No data compression

S46=138   V.42bis data compression on

S48* V.42 Negotiation Control – V.42bis Connection Setup Protocol

S48=0   Only LAPM connection possible

S48=7   LAPM or MNP 4 connection

S48=128   Connection protocol as laid down in S36

S86   <u>Call Failure Reason Code</u>

When a connection fails (NO CARRIER) an event code is written into this registry.

S86=0   Normal disconnect, no error

S86=4   Carrier lost

S86=5   No error corrected (V.42) connection could be established

S86=6   No extensions could be negotiated

S86=7   Remote terminal only supports synchronous modems

S86=8   No joint framing detected

S86=9   No protocol could be established

S86=10   Invalid answer when negotiating extensions

S86=11   No synchronous marks received from remote terminal

S86=12   Normal disconnection by remote terminal

S86=13   Remote terminal didn't respond any more (ten attempts)

S86=14   Protocol error

S86=15   DTR drop

S86=16   Remote terminal demanded cleardown (GSTN cleardown)

S86=17   Inactivity timer expired

S86=18   Desired speed is not supported

S86=19   Long space disconnect

S86=20   Key abort (character was sent during connection setup)

S86=22   No connection setup possible

S86=23   Cleardown after 3 retrains

S86=26   Remote terminal hung up

S91*   <u>Transmit Level</u>

The value for the transmit level of the modem is stored in the S91 registry. The value can be set between 0 and 15. The connection can in some cases be improved by decreasing the transmit level.

S91=0   Transmit level – 1 dBm

S91=15   Transmit level – 16dBm

Note: The range and the default value depend on the country settings **(AT+GCI)**.

S95* <u>Result Code Control – Result code</u>

Bit	Meaning
Bit 0	CONNECT message with line speed
Bit 1	CONNECT/ARO message for error corrected connection
Bit 2	CARRIER messages enabled (messages 40 – 47)
Bit 3	PROTOCOL messages enabled (messages 70 – 80)
Bit 4	Reserved
Bit 5	COMPRESSION message enabled (messages 66 - 69)
Bit 6	Reserved
Bit 7	Reserved

S95* <u>Result Code Control – Result code</u>

3 Country Codes

The standard TBR21 applies to all public phone networks in EU countries (Belgium, Denmark, German, Finland, France, Greece, Great Britain, Ireland, Italy, Luxembourg, Netherlands, Austria, Portugal, Sweden, Spain), as well as in Switzerland, Liechtenstein, Norway and Iceland. Only old telecommunications systems require an explicit setting of the individual country.

3.1 Version for Standard Countries

Country	Country code	Country	Country code
TBR21	FD (default)		
Belgium	0F	Mexico	73
Brazil	16	Netherlands	7B
China	26	Norway	82
Denmark	31	Austria	0A
Germany	42	Poland	8A
Finland	3C	Portugal	8B
France	3D	Romania	8E
Greece	46	Saudi Arabia	98
Great Britain	B4	Sweden	A5
India	53	Switzerland	A6
Ireland	57	Slovak Republic	FB
Iceland	52	Slovenia	FC
Italy	59	Spain	A0
ITU/Taiwan	FE	Czech Republic	2E
Japan	00	Turkey	AE
Canada	20	Hungary	51
Kuwait	62		

3.2 Version for Extended Country Group

Country	Country code	Country	Country code
TBR21	FD (default)	Kuwait	62
Egypt	36	Lebanon	64
Argentina	07	Malaysia	6C
Belgium	0F	New Zealand	7E
Brazil	16	Nigeria	81
Bulgaria	1B	Pakistan	84
Chile	25	Panama	85
China	26	Paraguay	87
Dominican Republic	33	Philippines	89
Estonia	F9	Russian Federation	B8
Hong Kong	50	Senegal	99
India	53	Singapore	9C
Indonesia	54	Sri Lanka	A1
Israel	58	South Africa	9F
Japan	00	Uruguay	B7
Colombia	27	Venezuela	BB
Republic of Korea	61	United Arab Emirates	B3
Croatia	FA	Cyprus	2D

3.3 Country Codes for Both Versions

Country	Country code	Country	Country code	Country	Country code
Australia	09	Honduras	FE	Oman	FE
Algeria	FE	Yemen	FE	Peru	FE
Bolivia	FE	Jordan	FE	Thailand	A9
Bosnia Herzegovina	FE	ITU/Taiwan	FE	Tunisia	FE
Brunei	FE	Liechtenstein	FD	Ukraine	FE
Costa Rica	FE	Latvia	FD	USA	B5
Ecuador	FE	Lithunia	FE	Belarus	FE
El Salvador	FE	Morocco	FE		
Guatemala	FE	Nicaragua	FE		

Space for Comments: