

# Overview AT-command



## INSYS GPRS 5.0 serial

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# 1 General

All INSYS communication devices are controlled internally via **AT** commands. To enter AT commands directly we recommend the terminal program TeraTerm by T. T. Teranishi. The free software can be downloaded at <http://www.vector.co.jp/authors/VA002416/teraterm.html>.

Each **AT** command starts with the letters **AT** and ends with a "Carriage Return" (CR). Capital and small letters will both be accepted, but the leading characters must be either '**AT**' or '**at**'. The command line is evaluated after the modem receives a Return command. In the description, a parameter with the letter "**n**" means that it can have various values.

For example **ATC<n>**, where '**n**' can have the value 0 or 1, e.g. **ATC1** (DCD always on). For commands which expect a parameter but don't have a parameter, the modem will automatically assume the parameter 0. For example, the commands **AT&D** and **ATD0** will have the same effect.

The factory settings are marked "(default)".

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.

| Response         | Code | Type             | Meaning                                                                                                                      |
|------------------|------|------------------|------------------------------------------------------------------------------------------------------------------------------|
| OK               | 0    | Final            | Command executed, no error                                                                                                   |
| CONNECT          | 1    | Final            | Connection established if parameter setting X=0                                                                              |
| CONNECT [<text>] |      | Final            | 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 DIALTONE      | 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                                                                                                 |

The standard **AT** commands can be entered locally via the serial interface if the device is in offline state. In the online command mode, only the commands **ATH** and **ATO** are available.

The extended INSYS **AT\*\*** (Chap. 6.1) commands can be entered locally as well as remotely (remote configuration) and in most cases also via SMS. The configuration via SMS is restricted to commands with responses of up to 140 characters.

To ease the legibility of further comments, **<CR>** (carriage return) is always used as end-of-line character, and the standard responses **OK** or **ERROR** are used as responses, regardless of the actually selected responses according to V.25.



It is usually not possible to put more than one **AT** command in a command line. Subsequent commands may be entered only after the previous command has been completed by its result code.

Refer to the complete command set of the GSM engine for the combination of more than one standard **AT** commands in a single command line.

## 2 Short description of the AT commands

### 2.1 Overview

For a detailed description of syntax and parameters see Chap. 3.1

| Command                | Short description                                                              | Implementation possible |                 |        |     |
|------------------------|--------------------------------------------------------------------------------|-------------------------|-----------------|--------|-----|
|                        |                                                                                | Offline<br>local        | Online<br>local | Remote | SMS |
| <b>ATD</b>             | Establish CSD or “TCP transparent” connections                                 | X                       |                 |        | X   |
| <b>ATH</b>             | Terminate CSD or “TCP transparent” connections                                 |                         | X               |        | X   |
| <b>AT**AUTOCSD</b>     | AutoDial CSD destination number                                                | X                       | X               | X      | X   |
| <b>AT**AUTOIP</b>      | AutoDial destination: IP address                                               | X                       | X               | X      | X   |
| <b>AT**AUTOPORTIP</b>  | AutoDial destination port for destination IP                                   | X                       | X               | X      | X   |
| <b>AT**AUTOURL</b>     | AutoDial destination: domain name                                              | X                       | X               | X      | X   |
| <b>AT**AUTOPORTURL</b> | AutoDial destination port for domain name                                      | X                       | X               | X      | X   |
| <b>AT**BAUD</b>        | Baud rate of the serial interface                                              | X                       |                 | X      | X   |
| <b>AT**CALLBACK</b>    | AutoDial function callback                                                     | X                       | X               | X      | X   |
| <b>AT**CLIP</b>        | Selective Call Answer                                                          | X                       | X               | X      | X   |
| <b>AT**DEFAULT</b>     | Factory settings of the INSYS AT commands                                      | X                       | X               | X      | X   |
| <b>AT**DIALIN</b>      | Dial-in type for integrated TCP/IP stack                                       | X                       | X               | X      | X   |
| <b>AT**DIALINNR</b>    | Dial-in number for integrated TCP/IP stack                                     | X                       | X               | X      | X   |
| <b>AT**EXIT</b>        | Exit remote command mode                                                       |                         |                 | X      |     |
| <b>AT**FLASH</b>       | Firmware update of the $\mu$ controller                                        | X                       |                 | X      |     |
| <b>AT**FORMAT</b>      | Data format of the serial interface                                            | X                       | X               | X      | X   |
| <b>AT**GPRSAPN</b>     | GPRS-APN for integrated TCP/IP stack                                           | X                       | X               | X      | X   |
| <b>AT**GSMNET</b>      | Display of GSM network parameters                                              | X                       | X               | X      | X   |
| <b>AT**GSMREQ</b>      | Query interval for automatic SMS processing and reading the network parameters | X                       | X               | X      | X   |
| <b>AT**IMEI</b>        | Display of device IMEI                                                         | X                       | X               | X      | X   |
| <b>AT**IN</b>          | Query of the switch inputs                                                     | X                       | X               | X      | X   |
| <b>AT**KEEP</b>        | TCP Keep Alive                                                                 | X                       | X               | X      | X   |
| <b>AT**LASTCON</b>     | Display of information about the last connection                               | X                       | X               | X      | X   |

| Command             | Short description                                         | Implementation possible |              |        |     |
|---------------------|-----------------------------------------------------------|-------------------------|--------------|--------|-----|
|                     |                                                           | Offline local           | Online local | Remote | SMS |
| <b>AT**LL</b>       | AutoDial function leased line                             | X                       | X            | X      | X   |
| <b>AT**LOGOUT</b>   | Timer-controlled logout/login                             | X                       | X            | X      | X   |
| <b>AT**OUT</b>      | Set/reset the switch outputs                              | X                       | X            | X      | X   |
| <b>AT**PASSC</b>    | Configuration password                                    | X                       | X            | X      | X   |
| <b>AT**PIN</b>      | SIM card PIN                                              | X                       | X            | X      | X   |
| <b>AT**PPPAUTH</b>  | PPP authentication type for integrated TCP/IP stack       | X                       |              | X      | X   |
| <b>AT**PPPPW</b>    | PPP password for integrated TCP/IP stack                  | X                       | X            | X      | X   |
| <b>AT**PPPUSE</b>   | PPP user name for integrated TCP/IP stack                 | X                       | X            | X      | X   |
| <b>AT**PROFILE</b>  | Display settings                                          | X                       | X            | X      |     |
| <b>AT**PROVIDER</b> | GSM network provider selection                            | X                       | X            | X      | X   |
| <b>AT**RESET</b>    | Restart                                                   | X                       | X            | X      | X   |
| <b>AT**SAVE</b>     | Save the extended INSYS settings                          | X                       | X            | X      | X   |
| <b>AT**SCN</b>      | SMS service center number                                 | X                       | X            | X      | X   |
| <b>AT**SIGNAL</b>   | GSM signal field strength                                 | X                       | X            | X      | X   |
| <b>AT**SMSRX</b>    | Automatic SMS reception processing                        | X                       | X            | X      | X   |
| <b>AT**TCPAGG</b>   | TCP block formation timer of the integrated TCP/IP stack: | X                       | X            | X      | X   |
| <b>AT**VCOM</b>     | Support of the INSYS virtual COM port driver              | X                       | X            | X      | X   |
| <b>AT**VERSION</b>  | Display of the software version                           | X                       | X            | X      | X   |

X = implemented

## 2.2 Availability/Storage

The following **AT\*\*** commands are saved immediately after they are entered without **AT\*\*SAVE**, but only activated after a restart.

- **AT\*\*PROVIDER**
- **AT\*\*PIN**
- **AT\*\*GPRSAPN**
- **AT\*\*PPPAUTH**

The following settings are immediately saved when entered, and active:

- **AT\*\*BAUD**
- **AT\*\*FORMAT**

The other settings are immediately accepted and first stored permanently with **AT\*\*SAVE**.



## 3 Overview AT-commands

### 3.1 INSYS AT-commands

#### 3.1.1 Description INSYS AT commands

|                    |                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT**AUTOCSO</b> | <b><u>AutoDial CSD destination number</u></b>                                                                                                                                                                        |
| Read:              | <b>AT**AUTOCSO?</b><br>Response:<br><b>AUTOCSO: &lt;number&gt;</b><br><b>OK</b>                                                                                                                                      |
| Write:             | <b>AT**AUTOCSO=&lt;number&gt;</b><br>Parameters:<br><b>&lt;number&gt;</b> Phone number which is called for the AutoDial functions callback or Leased Line as CSD connection. The maximum length is 20 characters.    |
| Delete:            | <b>AT**AUTOCSO=</b><br>After "=", the input line is completed with <CR>.                                                                                                                                             |
| Default:           | Empty                                                                                                                                                                                                                |
| <b>AT**AUTOIP</b>  | <b><u>AutoDial destination IP</u></b>                                                                                                                                                                                |
| Read:              | <b>AT**AUTOIP?</b><br>Response:<br><b>AUTOIP: &lt;ip&gt;</b><br><b>OK</b>                                                                                                                                            |
| Write:             | <b>AT**AUTOIP=&lt;ip&gt;</b><br>Parameters:<br><b>&lt;ip&gt;</b> IP address which is called for the AutoDial functions Callback or Leased Line as "TCP transparent" IP connection, e.g. <b>AT**AUTOIP=213.7.0.46</b> |
| Delete:            | <b>AT**AUTOIP=</b><br>After "=", the input line is completed with <CR>.                                                                                                                                              |
| Default:           | 0.0.0.0                                                                                                                                                                                                              |

|                       |                                                                                                                                                                                                                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT**AUTOPORTIP</b> | <b><u>AutoDial destination port for destination IP</u></b>                                                                                                                                                                                                                       |
| Read:                 | <b>AT**AUTOPORTIP?</b><br>Response:<br><b>AUTOPORTIP: &lt;port&gt;</b><br><b>OK</b>                                                                                                                                                                                              |
| Write:                | <b>AT**AUTOPORTIP=&lt;port&gt;</b><br>Parameters:<br><b>&lt;port&gt;</b> TCP port, for which for the AutoDial functions (Callback or Leased Line) a "TCP transparent" IP connection is established. Values from 1...65535.                                                       |
| Delete:               | <b>AT**AUTOPORTIP=</b><br>After "=", the input line is completed with <CR>.                                                                                                                                                                                                      |
| Default:              | 0                                                                                                                                                                                                                                                                                |
| <b>AT**AUTOURL</b>    | <b><u>AutoDial destination: domain name</u></b>                                                                                                                                                                                                                                  |
| Read:                 | <b>AT**AUTOURL?</b><br>Response:<br><b>AUTOURL: &lt;domain&gt;</b><br><b>OK</b>                                                                                                                                                                                                  |
| Write:                | <b>AT**AUTOURL=&lt;domain&gt;</b><br>Parameters:<br><b>&lt;domain&gt;</b> Domain name, to which the AutoDial functions (callback or leased line) establish a "TCP transparent" connection. The maximum length is 30 characters.<br>E.g. <b>AT**AUTOURL=leitstelle.dyndns.org</b> |
| Delete:               | <b>AT**AUTOURL=</b><br>After "=", the input line is completed with <CR>.                                                                                                                                                                                                         |
| Default:              | Empty                                                                                                                                                                                                                                                                            |

**AT\*\*AUTOPORTURL    AutoDial destination: Port for domain name**Read:                **AT\*\*AUTOPORTURL?**

Response:

**AUTOPORTURL: <port>****OK**Write:                **AT\*\*AUTOPORTURL=<port>**

Parameters:

**<port>**                TCP port, for which for the AutoDial functions  
 (Callback or Leased Line) a "TCP transparent" IP connection  
 is established. Values from 1...65535.

Delete:                **AT\*\*AUTOPORTURL**After "=", the input line is completed with **<CR>**.Default:                **0****AT\*\*BAUD                Baud rate at the serial interface**Read:                **AT\*\*BAUD?**

Response:

**BAUD: <baud>****OK**Write:                **AT\*\*BAUD=<baud>**Parameters: **<baud>**

|        |        |     |
|--------|--------|-----|
| 300    | 300    | bps |
| 600    | 600    | bps |
| 1200   | 1200   | bps |
| 2400   | 2400   | bps |
| 4800   | 4800   | bps |
| 9600   | 9600   | bps |
| 19200  | 19200  | bps |
| 57600  | 57600  | bps |
| 115200 | 115200 | bps |

For local or SMS configurations, the output of the response takes place with the  
 old baud rate; the baud rate will be changed immediately afterwards.  
 For remote configurations, the change takes place after a reset of the device only.

Default:                **AT\*\*BAUD=19200**

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------|------------|-------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------|
| <b>AT**CALLBACK</b> | <b><u>Callback</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
| Read:               | <b>AT**CALLBACK?</b><br>Response:<br><b>AT**CALLBACK=&lt;callback_clip1&gt;,&lt;callback_clip2&gt;,&lt;callback_clip3&gt;</b><br><b>OK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
| Write:              | <b>AT**CALLBACK=&lt;callback_clip1&gt;[,&lt;callback_clip2&gt;[,&lt;callback_clip3&gt;]]</b><br><br>An action is assigned to the according CLIP ( <b>AT**CLIP1/2/3</b> ), which is performed when a call from this phone number is indicated.<br><br>Parameters:<br><b>&lt;callback_clip1/2/3&gt;</b> <table> <tr> <td><b>0 :</b></td><td>No callback action; clip serves as call protection only</td></tr> <tr> <td><b>1 :</b></td><td>CSD callback; the number after <b>AT**AUTOCSD</b> is called</td></tr> <tr> <td><b>2 :</b></td><td>IP callback: IP address and IP port after <b>AT**AUTOIP</b> / <b>AT**AUTOPORTIP</b> are contacted</td></tr> <tr> <td><b>3 :</b></td><td>Domain name callback to domain name and: IP ports stored with <b>AT**AUTOURL</b> and <b>AT**AUTOPORTURL</b></td></tr> </table><br>The activation and configuration of the selective call acceptance ( <b>AT**CLIP</b> ) is required for the function callback. | <b>0 :</b> | No callback action; clip serves as call protection only | <b>1 :</b> | CSD callback; the number after <b>AT**AUTOCSD</b> is called | <b>2 :</b> | IP callback: IP address and IP port after <b>AT**AUTOIP</b> / <b>AT**AUTOPORTIP</b> are contacted | <b>3 :</b> | Domain name callback to domain name and: IP ports stored with <b>AT**AUTOURL</b> and <b>AT**AUTOPORTURL</b> |
| <b>0 :</b>          | No callback action; clip serves as call protection only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
| <b>1 :</b>          | CSD callback; the number after <b>AT**AUTOCSD</b> is called                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
| <b>2 :</b>          | IP callback: IP address and IP port after <b>AT**AUTOIP</b> / <b>AT**AUTOPORTIP</b> are contacted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
| <b>3 :</b>          | Domain name callback to domain name and: IP ports stored with <b>AT**AUTOURL</b> and <b>AT**AUTOPORTURL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
| Delete:             | <b>AT**CALLBACK=</b><br>After "=", the input line is completed with <b>&lt;CR&gt;</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |
| Default:            | <b>AT**CALLBACK=</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                         |            |                                                             |            |                                                                                                   |            |                                                                                                             |

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                  |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>AT**CLIP</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Selective call acceptance for connections and SMS processing</b>                                              |
| Read:           | <b>AT**CLIP?</b><br>Response:<br><b>CLIP: &lt;status&gt;</b><br><b>CLIP 1: &lt;number&gt;</b><br><b>CLIP 2: &lt;number&gt;</b><br><b>CLIP 3: &lt;number&gt;</b><br><b>OK</b><br>Parameters:<br><b>&lt;status&gt;</b> 0                      Selective call acceptance inactive<br>1                      Selective call acceptance active                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Detect phone numbers.                                                                                            |
| Write:          | <b>AT**CLIP=&lt;status&gt;</b><br>Parameters:<br><b>&lt;status&gt;</b> 0                      Selective call acceptance inactive<br>1                      Selective call acceptance active<br><b>AT**CLIP&lt;index&gt;=&lt;number&gt;</b><br>Parameters:<br><b>&lt;index&gt;</b> 1 ... 3                      3 entries for phone numbers<br>99                      delete complete list<br><b>&lt;number&gt;</b> Phone number from which a call or an SMS are accepted by the<br>INSYS GPRS 5.0 serial. The maximum length is 20 characters.<br>It is possible to allow whole blocks of numbers: The wildcard char-<br>acter "*" stands for exactly one digit.<br>The caller has to activate the calling line identification presentation (CLIP) to use<br>this security function.<br>The selective call acceptance is only active after a device reset. The GSM engine<br>works with the setting <b>AT+CLIP=1</b> then. The phone number is displayed in con-<br>nection with the "RING" message for each incoming call.<br>Example:<br><b>RING</b><br><b>+CLIP: "+49941560061",145,,,0</b><br>The allowed number has to be entered in exactly the same format as it is output<br>for a call with "+CLIP: ...." (without " ").<br><b>Note:</b> <b>The transmitted format of the number may depend on the pro-<br/>                                                    provider – e.g. the leading "+49" may be replaced by "0049". We<br/>                                                    therefore urgently recommend verifying the entry by placing a<br/>                                                    test call.</b><br>Incoming calls of numbers which are not allowed are rejected immediately to<br>keep the line free. They can neither be accepted manually ( <b>ATA</b> ). The caller re-<br>ceives the busy signal <b>BUSY</b> . | enable / disable call acceptance<br>Enter allowed phone numbers                                                  |
| Delete:         | <b>AT**CLIP=</b><br><b>AT**CLIP&lt;index&gt;=</b><br><b>AT**CLIP99=</b><br>After "=", the input line is completed with <b>&lt;CR&gt;</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | The selective call acceptance is deactivated.<br>The single entry will be deleted.<br>Deletes the complete list. |
| Default:        | Inactive, all numbers empty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                  |

**AT\*\*DEFAULT****Load factory settings****Write:****AT\*\*DEFAULT**

The following factory settings for the **AT\*\*** commands are set. See also **AT&F** – Chap. 6.1 -

**BAUD:** 19200**FORMAT:** 8N1**SCN:****LOGIN:** 0**LOGOUT:** 0**GSMREQ:** 60**SMSRX:** 1**PASSC:** inactive**CLIP:** inactive**CLIP 1:****CLIP 2:****CLIP 3:****DIALIN:** 1**DIALINNR:****GPRSAPN:****PPPAUTH:** 0**PPPUSE:****PPPPW:****VCOM:** active**KEEP:** 0**TCPAGG:** 100**AUTOCS:****AUTOIP:** 0.0.0.0**AUTOPTIP:** 0**AUTOURL:****AUTOPTURL:** 0**CALLBACK:** 0,0,0**LL:** 0**Notes:****A set PIN will not be deleted (see AT\*\*PIN)**

**After the command has been executed, the INSYS GPRS 5.0 serial will automatically initiate a restart to correctly implement the changed settings and to re-initialize the GSM/GPRS engine!**

|                     |                                                                                                                                                                                                                          |                               |                     |   |                               |  |   |                            |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------|---|-------------------------------|--|---|----------------------------|
| <b>AT**DIALIN</b>   | <b><u>Services for integrated TCP/IP connection</u></b>                                                                                                                                                                  |                               |                     |   |                               |  |   |                            |
| Read:               | <b>AT**DIALIN?</b><br><br>Response:<br><b>DIALIN: &lt;mode&gt;</b><br><br><b>OK</b>                                                                                                                                      |                               |                     |   |                               |  |   |                            |
| Write:              | <b>AT**DIALIN=&lt;mode&gt;</b><br><br>Parameters:<br><table><tr><td><b>&lt;mode&gt;</b></td><td>0</td><td>Dialup via GSM CSD connection</td></tr><tr><td></td><td>1</td><td>Dialup via GPRS connection</td></tr></table> |                               | <b>&lt;mode&gt;</b> | 0 | Dialup via GSM CSD connection |  | 1 | Dialup via GPRS connection |
| <b>&lt;mode&gt;</b> | 0                                                                                                                                                                                                                        | Dialup via GSM CSD connection |                     |   |                               |  |   |                            |
|                     | 1                                                                                                                                                                                                                        | Dialup via GPRS connection    |                     |   |                               |  |   |                            |
| Delete:             | <b>AT**DIALIN=</b><br><br>After "=", the input line is completed with <CR>.                                                                                                                                              |                               |                     |   |                               |  |   |                            |
| Default:            | 1                                                                                                                                                                                                                        |                               |                     |   |                               |  |   |                            |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                       |                                                                                                                                                                                                                                                                                                                                       |  |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>AT**DIALINNR</b>   | <b><u>Dial-in number of the TCP/IP provider</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                       |                                                                                                                                                                                                                                                                                                                                       |  |
| Read:                 | <b>AT**DIALINNR?</b><br><br>Response:<br><b>DIALINNR: &lt;number&gt;</b><br><br><b>OK</b>                                                                                                                                                                                                                                                                                                                                                                                 |  |                       |                                                                                                                                                                                                                                                                                                                                       |  |
| Write:                | <b>AT**DIALINNR=&lt;number&gt;</b><br><br>Parameters:<br><table><tr><td><b>&lt;number&gt;</b></td><td colspan="2">Phone number that marks the PPP remote terminal for the dialup to use the integrated TCP/IP stack.<br/>When dialing in via GPRS (<b>AT**DIALIN=1</b>) this must be *99***1#.<br/>When dialing in via GSM CSD, the number of the used ISP must be used. Many ISP offer a special abbreviated number for GSM, such as 22243 at Freenet.</td></tr></table> |  | <b>&lt;number&gt;</b> | Phone number that marks the PPP remote terminal for the dialup to use the integrated TCP/IP stack.<br>When dialing in via GPRS ( <b>AT**DIALIN=1</b> ) this must be *99***1#.<br>When dialing in via GSM CSD, the number of the used ISP must be used. Many ISP offer a special abbreviated number for GSM, such as 22243 at Freenet. |  |
| <b>&lt;number&gt;</b> | Phone number that marks the PPP remote terminal for the dialup to use the integrated TCP/IP stack.<br>When dialing in via GPRS ( <b>AT**DIALIN=1</b> ) this must be *99***1#.<br>When dialing in via GSM CSD, the number of the used ISP must be used. Many ISP offer a special abbreviated number for GSM, such as 22243 at Freenet.                                                                                                                                     |  |                       |                                                                                                                                                                                                                                                                                                                                       |  |
| Delete:               | <b>AT**DIALINNR=</b><br><br>After "=", the input line is completed with <CR>.                                                                                                                                                                                                                                                                                                                                                                                             |  |                       |                                                                                                                                                                                                                                                                                                                                       |  |
| Default:              | Empty                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                       |                                                                                                                                                                                                                                                                                                                                       |  |

**AT\*\*EXIT**      **Exit remote command mode**

Write:

**AT\*\*EXIT**

Response:

**OK**

Response for input failure / not in remote configuration mode:

**ERROR**

After executing this command correctly, the INSYS GPRS 5.0 is again in data transmission mode.

**Note: This command cannot be executed via SMS.****AT\*\*FLASH****Firmware update of the controller**

Write:

The firmware of the  $\mu$ controller can be loaded locally (via the serial interface), and remote (CSD or "TCP transparent" connection).**The use of hardware handshake is absolutely necessary; make sure that for remote flash the modem of the remote terminal is set to hardware handshake as well as the terminal program.**The command **AT\*\*FLASH** will start the upload process and the device will prepare itself for receiving the firmware.After the response Send **\*.HEX file now** the firmware (file with the ending **\*.hex**) is sent as a text file.**Depending on the loaded firmware version, the settings for the extended functions are reset to factory settings after the update. Please note this when performing a remote update.****The SIM card PIN (AT\*\*PIN) and the standard command settings of the GSM/GPRS engine are maintained, which means that if automatic call acceptance (e.g. ATSO=2) is activated, the device can still be accessed from outside to enable the re-configuration of the extended functions per CSD call via remote configuration.**Routine:

Entry:

**AT\*\*FLASH**

Response (after approx. 6 seconds):

**Send \*.HEX file now.****Send firmware file as text file (not binary).**

Response:

**Upload OK. Updating FW...****Note: After the file has been received the device needs up to 60 seconds to complete the update. After that, the INSYS GPRS 5.0 serial will automatically restart.****This command cannot be executed via SMS.**



**AT\*\*FORMAT**      **Data format of the serial interface**Read:            **AT\*\*FORMAT?**

Response:

**FORMAT: <format>****OK**Write:           **AT\*\*FORMAT=<format>**

Parameters:

|                       |            |                                      |
|-----------------------|------------|--------------------------------------|
| <b>&lt;format&gt;</b> | <b>8N1</b> | 8 data bits, 1 stop bit, no parity   |
|                       | <b>8E1</b> | 8 data bits, 1 stop bit, even parity |
|                       | <b>8O1</b> | 8 data bits, 1 stop bit, odd parity  |
|                       | <b>8N2</b> | 8 data bits, 2 stop bit, no parity   |
|                       | <b>7E1</b> | 7 data bits, 1 stop bit, even parity |
|                       | <b>7O1</b> | 7 data bits, 1 stop bit, odd parity  |
|                       | <b>7N2</b> | 7 data bits, 2 stop bit, no parity   |
|                       | <b>7E2</b> | 7 data bits, 2 stop bit, even parity |

During local configuration the response at the serial interface is output with the old data format. The data format will be changed afterwards.

For remote configuration, the changes will be active after a reset of the device only.

Default:        **AT\*\*FORMAT=8N1****AT\*\*GPRSAPN**      **GPRS-APN for integrated TCP/IP stack**Read:            **AT\*\*GPRSAPN?**

Response:

**GPRSAPM: <apn>****OK**Write:           **AT\*\*GPRSAPN=<apn>**

Parameters:

**<apn>**                      APN (Access Point Name) of the GPRS provider. Maximum length 30 characters. E.g. **web.vodafone.de**

**Note:**      **Some providers offer various APNs which sometimes also distinguish themselves by different QoS. If necessary, ask your provider about which APN is the most suitable for your application.**

Delete:        **AT\*\*GPRSAPN=**

After "=", the input line is completed with **<CR>**.

Default:        Empty

**AT\*\*GSMNET?      Display of GSM network parameters**

Read:                AT\*\*GSMNET?

Response:

SIGNAL: 26

BER: 0

REG: 1

OPER: 0,0,"Vodafone.de"

MCC: 262

MNC: 2

LAC: 035D

CELL: 64C9

BSIC: 64

CHANN: 71

RSSI: 48

C1: 44

C2: 0

OK

The parameters are updated using the AT\*\*GSMREQ interval.

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------|---|------------------------------------------------------|--|---|-------------------------------------------------------------------------------------------|
| <b>AT**GSMREQ</b>     | <b><u>Query interval for automatic SMS processing and reading the network parameters</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
| Read:                 | <b>AT**GSMREQ?</b><br>Response:<br><b>GSMREQ: &lt;interval&gt;</b><br><b>OK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
| Write:                | <b>AT**GSMREQ=&lt;interval&gt;</b><br>Parameters:<br><b>&lt;interval&gt;</b> 20 ... 60      Update interval in seconds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
|                       | <p><b>Note: The automatic query of the GSM network parameters and incoming SMS in adjustable intervals (AT**GSMREQ) through the controller takes place via an independent module-internal interface and usually has no effect on the communication between the application and GSM/GPRS.</b></p> <p>Only when the SMS memory is accessed (especially reading and deleting), it can happen that the <math>\mu</math>controller accesses the SMS storage location at the same time. In this case, the application would receive ERROR as response. The application should therefore execute the command once more, if necessary.</p> |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
| Default:              | <b>AT**GSMREQ=60</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
| <b>AT**IMEI?</b>      | <b><u>Display of the device IMEI</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
| Read:                 | <b>AT**IMEI?</b><br>Response:<br><b>IMEI: &lt;imei&gt;</b><br><b>OK</b><br>The IMEI is a 15 digit number which is unique for each GSM/GPRS device and can therefore be used to identify a GSM/GPRS end device.                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
| <b>AT**IN</b>         | <b><u>Query of the switch inputs</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                           |                       |   |                                                      |  |   |                                                                                           |
| Read:                 | <b>AT**IN?</b><br>Response:<br><b>IN1: &lt;status&gt;</b><br><b>IN2: &lt;status&gt;</b><br><b>OK</b><br>Parameters:<br><table> <tr> <td><b>&lt;status&gt;</b></td><td>0</td><td>Switch input operated: Switch input connected to GND</td></tr> <tr> <td></td><td>1</td><td>Idle state: Switch input open (not connected to GND): internal pull-up resistor available</td></tr> </table>                                                                                                                                                                                                                                            |                                                                                           | <b>&lt;status&gt;</b> | 0 | Switch input operated: Switch input connected to GND |  | 1 | Idle state: Switch input open (not connected to GND): internal pull-up resistor available |
| <b>&lt;status&gt;</b> | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Switch input operated: Switch input connected to GND                                      |                       |   |                                                      |  |   |                                                                                           |
|                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Idle state: Switch input open (not connected to GND): internal pull-up resistor available |                       |   |                                                      |  |   |                                                                                           |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                       |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| AT**KEEP | <u>TCP Keep Alive</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                       |
| Read:    | AT**KEEP?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                       |
|          | Response:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                       |
|          | KEEP: <interval>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                       |
|          | OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                       |
| Write:   | AT**KEEP=<interval>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                       |
|          | Parameters:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                       |
|          | <interval>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 Do not send TCP Keep Alive packets                                  |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1...255 Time periods between two monitoring packets in 1 minute units |
|          | <p>This timer enables the monitoring of an existing TCP/IP connection when no data is transferred. If 3 consecutive monitoring packets are not answered, the connection is terminated.</p> <p>If the device is configured as a leased line device, the connection will then be re-established.</p> <p>Keep Alive will mostly be used for leased lines, because the application on location is usually not able to assume the connection control and monitoring.</p> <p><b>Note:</b> Keep Alive generates traffic. In principle, each Keep Alive packet is an empty TCP/IP message which must be confirmed. For one Keep Alive, two empty TCP/IP messages with 40 bytes each are required.</p> <p>When selecting the timeout, besides ensuring that the connection is monitored, the pricing of the current GPRS contract must also be considered.</p> |                                                                       |
| Delete:  | AT**KEEP=                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                       |
|          | After "=", the input line is completed with <CR>.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                       |
| Default: | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                       |

**AT\*\*LASTCON?      Display of information about the last connection**

Read:

**AT\*\*LASTCON?**Response without previous connection:**TP: NONE****RC: NONE****RD: NONE****DN:****DI: 0.0.0.0****DP: 0****SI: 0.0.0.0****SP: 0****OK**Response for outgoing CSD connections:**TP: <type>****RC: <reason connect>****RD: <reason disconnect>****DN: <dest nr>****OK**Response for incoming CSD connections:**TP: <type>****RC: <reason connect>****RD: <reason disconnect>****SN: <source nr>****OK**Response for "TCP transparent" IP connections:**TP: <type>****RC: <reason connect>****RD: <reason disconnect>****DN: <dest nr>****DI: <dest ip>****DP: <dest port>****SI: <source ip>****SP: <source port>****OK**

|                |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Read:          | <u>Response for "TCP transparent" connections to a domain name:</u>                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |
| (Continuation) | <b>TP: &lt;type&gt;</b><br><b>RC: &lt;reason connect&gt;</b><br><b>RD: &lt;reason disconnect&gt;</b><br><b>DN: &lt;dest nr&gt;</b><br><b>DU: &lt;dest domain&gt;</b><br><b>DI: &lt;dest ip&gt;</b><br><b>DP: &lt;dest port&gt;</b><br><b>SI: &lt;source ip&gt;</b><br><b>SP: &lt;source port&gt;</b><br><br><b>OK</b> |                                                                                                                                                                                                                                                                               |
|                | <u>Parameters:</u>                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                               |
|                | <b>&lt;type&gt;:</b>                                                                                                                                                                                                                                                                                                  | <b>CSD</b> CSD connection<br><b>IP</b> "TCP Transparent" IP connection<br><b>IPURL</b> "TCP transparent" connection to a domain                                                                                                                                               |
|                | <b>&lt;reason connect&gt;:</b>                                                                                                                                                                                                                                                                                        | <b>IN</b> Incoming connection (only CSD)<br><b>OUTMANU</b> Manual dialing via <b>ATD</b><br><b>OUTAUTO</b> Dialing via AutoDial function callback or LL (dedicated line) with destination<br><b>AT**AUTOCSD, AT**AUTOIP / AT**AUTOPORTIP or AT**AUTOURL / AT**AUTOPORTURL</b> |
|                | <b>&lt;reason disconnect&gt;:</b>                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                               |
|                | <b>General:</b>                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                               |
|                | <b>ATH</b>                                                                                                                                                                                                                                                                                                            | Local connection (in online command mode) terminated due to hang up via <b>ATH</b>                                                                                                                                                                                            |
|                | <b>CSD</b>                                                                                                                                                                                                                                                                                                            | Remote terminal has hung up or the connection/connection setup was terminated on the GSM-side                                                                                                                                                                                 |
|                | <b>DTR</b>                                                                                                                                                                                                                                                                                                            | Connection terminated by locally hanging up via DTR drop (setting <b>AT&amp;D2</b> ).                                                                                                                                                                                         |
|                | <b>NONE</b>                                                                                                                                                                                                                                                                                                           | Connection still active (query in online command mode)                                                                                                                                                                                                                        |

|                         |                                           |                                                                                                                                                                                                                                            |
|-------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Read:<br>(Continuation) | <b>Only CSD connection:</b>               |                                                                                                                                                                                                                                            |
|                         | <b>CLIP</b>                               | For activated, selective call acceptance ( <b>AT**CLIP=1</b> ) the connection was refused (caller did not transmit number or number was not authorized)                                                                                    |
|                         | <b>KEY</b>                                | During the connection setup, a character was sent to INSYS GPRS 5.0 serial via the serial interface.                                                                                                                                       |
|                         | <b>Only "TCP Transparent" connection:</b> |                                                                                                                                                                                                                                            |
|                         | <b>DNS</b>                                | No IP address could be allocated to the dialed domain via DNS request (e.g. domain name does not exist)                                                                                                                                    |
|                         | <b>PPP</b>                                | Connection setup not established on the PPP side (e.g. wrong PPP authentication)                                                                                                                                                           |
|                         | <b>TCP</b>                                | Connection setup not established on the TCP side (e.g. no reply from remote terminal), or already established connection was terminated on the TCP side (e.g. remote connection terminated the connection, or timeout, e.g. by Keep Alive) |
|                         | <b>&lt;dest nr&gt;:</b>                   | <b>For CSD connection:</b><br>Target number<br><b>For "TCP Transparent" connection:</b><br>Dial-in number <b>AT**DIALINNR</b>                                                                                                              |
|                         | <b>&lt;source nr&gt;:</b>                 | <b>Only for incoming CSD connection:</b><br>Number of caller; <b>AT+CLIP=1</b> or <b>AT**CLIP=1</b> (selective call acceptance) must be active and the caller must transmit his phone number.                                              |

|                         |                |                                                                                                                                                                                      |
|-------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Read:<br>(Continuation) | <dest domain>: | <b>Only for "TCP transparent" connection to a domain:</b> Dialed remote terminal domain name                                                                                         |
|                         | <dest ip>:     | <b>Only for "TCP Transparent" connection:</b><br>IP remote terminal address; is only entered for a connection to a domain name if the DNS request was successful                     |
|                         | <dest port>:   | <b>Only for "TCP Transparent" connection:</b><br>Dialed remote terminal TCP port                                                                                                     |
|                         | <source ip>:   | <b>Only for "TCP Transparent" connection:</b><br>Own IP address; is dynamically allocated when the PPP connection is established and then entered                                    |
|                         | <source port>: | <b>Only for "TCP Transparent" connection:</b><br>Own TCP port; is automatically selected from the TCP protocol stack and only entered after the TCP connection has been established. |
| Response (example):     |                |                                                                                                                                                                                      |
| TP: IP                  |                |                                                                                                                                                                                      |
| RC: OUT MANU            |                |                                                                                                                                                                                      |
| RD: TCP                 |                |                                                                                                                                                                                      |
| DN: *99***1#            |                |                                                                                                                                                                                      |
| DI: 200.70.12.34        |                |                                                                                                                                                                                      |
| DP: 12000               |                |                                                                                                                                                                                      |
| SI: 10.225.39.246       |                |                                                                                                                                                                                      |
| SP: 8000                |                |                                                                                                                                                                                      |
| OK                      |                |                                                                                                                                                                                      |



**AT\*\*LL                    AutoDial function leased line**Read:                    **AT\*\*LL?**

Response:

**LL: <ll\_action>****OK**Write:                    **AT\*\*LL=<ll\_action>**

Parameters:

**<ll\_action>:**

- |   |                                                                                                 |
|---|-------------------------------------------------------------------------------------------------|
| 0 | No leased line function                                                                         |
| 1 | CSD; the number after <b>AT**AUTOCS</b> is called                                               |
| 2 | IP; IP address and TCP-Port after <b>AT**AUTOIP</b> and <b>AT**AUTOPORTIP</b> are contacted     |
| 3 | Callback to domain name and TCP port as stored in <b>AT**AUTOURL</b> and <b>AT**AUTOPORTURL</b> |

The connection setup and the connection itself are monitored.

If the connection can not be established (network failure, no response from remote terminal) or if the connection is terminated (see 4.2 "TCP transparent), the INSYS GPRS 5.0 serial will automatically start reconnecting.

To limit the connection costs for inaccessible remote terminals (for each connection setup data packets are created and billed), the delay time will increase for every new repeated attempt.

- 20 seconds after restart or if the last connection setup was successful
- 80 seconds after the first false attempt
- 320 seconds after the second false attempt
- 1280 seconds after the third false attempt
- 1 hour for each additional false attempt

To safely monitor the connection, it is recommended in any case to use Keep Alive monitoring packets.

Delete:                    **AT\*\*LL=**

After "=", the input line is completed with **<CR>**.

Default:                    0

|                   |                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT**LOGOUT</b> | <b><u>Timer-controlled logout/login</u></b>                                                                                                                                                                                                                                                                                                                                                                   |
| Read:             | <b>AT**LOGOUT?</b><br><br>Response:<br><b>LOGOUT:      &lt;interval&gt;</b><br><b>OK</b><br><br>if the function is deactivated, "inactive" appears                                                                                                                                                                                                                                                            |
| Write:            | <b>AT**LOGOUT=&lt;interval&gt;</b><br><br>Parameter:<br><b>&lt;interval&gt;</b> <b>0</b> Function deactivated<br><b>1 ... 99</b> Logout interval in hours after device start;<br>1 minute after the logout, the i-modul 3.0 serial will<br>automatically log back in. The timer is reset.                                                                                                                     |
|                   | <b>Note:</b> <b>If a data connection (CSD or GPRS or "TCP transparent") is established at the time of the logout, the logout will wait until the connection is terminated.</b>                                                                                                                                                                                                                                |
| Default:          | <b>AT**LOGOUT=0</b>                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AT**OUT</b>    | <b><u>Set the switch outputs</u></b>                                                                                                                                                                                                                                                                                                                                                                          |
| Read:             | <b>AT**OUT?</b><br><br>Response:<br><b>OUT1: &lt;status&gt;</b><br><b>OUT2: &lt;status&gt;</b><br><b>OK</b>                                                                                                                                                                                                                                                                                                   |
| Write:            | <b>AT**OUT&lt;output&gt;=&lt;status&gt;</b><br><br>Parameters:<br><b>&lt;output&gt;</b> Switch output, for which the setting shall be valid.<br><b>1</b> Switch output 1 (UA1 - OUT1)<br><b>2</b> Switch output 2 (UA2 - OUT2)<br><br>If <b>&lt;output&gt;</b> is not specified, the switch output OUT1 is used.<br><br><b>&lt;status&gt;</b> <b>0</b> Switch output on LOW<br><b>1</b> Switch output on HIGH |
|                   | <b>Note:</b> <b>If the switch output settings must be restored after a restart, they must be saved with AT**SAVE .</b>                                                                                                                                                                                                                                                                                        |
| Default:          | <b>AT**OUT1=0</b><br><br><b>AT**OUT2=0</b>                                                                                                                                                                                                                                                                                                                                                                    |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT**PASSC</b> | <b><u>Configuration password</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Read:            | <b>AT**PASS?</b><br><br>Response:<br><b>PASSC: &lt;status&gt;</b><br><br><b>OK</b><br><br>Parameters:<br><b>&lt;status&gt;</b> <b>active</b> password stored<br><b>inactive</b> no password stored                                                                                                                                                                                                                                                    |
| Write:           | <b>AT**PASSC= [&lt;oldPW&gt; [, ] &lt;newPW&gt; , &lt;newPW&gt;]</b><br><br>response for input failure or if password incorrect:<br><b>ERROR</b><br><br><b>&lt;oldPW&gt;</b> old password; leave this space empty if no password is active<br><b>&lt;newPW&gt;</b> new password (enter twice for confirmation)<br><br>The passwords must be separated with commas but without additional spaces.<br><br>The maximum password length is 16 characters. |
| Delete:          | <b>AT**PASSC=&lt;oldPW&gt;</b><br><br>If the input line is closed with <CR> after <oldPW>, the entry will be deleted.                                                                                                                                                                                                                                                                                                                                 |
| Default:         | No passwords assigned                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Example:         | <u>Example:</u><br>Input of a new password for the configuration. Currently no password is stored:<br><b>AT**PASSC=&lt;newPW&gt; , &lt;newPW&gt;</b><br><br>The new password is: "test":<br><b>AT**PASSC=test , test</b>                                                                                                                                                                                                                              |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                          |            |  |                 |               |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------|------------|--|-----------------|---------------|
| <b>AT**PIN</b>        | <b><u>SIM card PIN</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                                                          |            |  |                 |               |
| Read:                 | <b>AT**PIN?</b><br><br>Response:<br><b>PIN: &lt;status&gt;</b><br><br><b>OK</b><br><br>Parameters:<br><table><tr><td><b>&lt;status&gt;</b></td><td><b>active</b></td><td>PIN stored</td></tr><tr><td></td><td><b>inactive</b></td><td>no PIN stored</td></tr></table>                                                                                                                                                                                                                                      | <b>&lt;status&gt;</b> | <b>active</b>                                            | PIN stored |  | <b>inactive</b> | no PIN stored |
| <b>&lt;status&gt;</b> | <b>active</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PIN stored            |                                                          |            |  |                 |               |
|                       | <b>inactive</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | no PIN stored         |                                                          |            |  |                 |               |
| Write:                | <b>AT**PIN=&lt;pin&gt;</b><br><br>Parameters:<br><table><tr><td><b>&lt;pin&gt;</b></td><td>Four digit number with the PIN of the inserted SIM card.</td></tr></table> <p>The setting will only be accepted after the device has been reset.</p> <p>Attention: Before inserting a new SIM card you have to ensure that the correct PIN is stored or if the PIN must be deleted. Otherwise the INSYS GPRS 5.0 serial tries to login with a wrong PIN, which results in a locking of the PIN if repeated.</p> | <b>&lt;pin&gt;</b>    | Four digit number with the PIN of the inserted SIM card. |            |  |                 |               |
| <b>&lt;pin&gt;</b>    | Four digit number with the PIN of the inserted SIM card.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |                                                          |            |  |                 |               |
| Delete:               | <b>AT**PIN=</b><br><br>After “=”, the input line is completed with <b>&lt;CR&gt;</b> .                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |                                                          |            |  |                 |               |
| Default:              | no PIN stored                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |                                                          |            |  |                 |               |

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                        |   |     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------|---|-----|
| <b>AT**PPPAUTH</b> | <b><u>PPP authentication type for integrated TCP/IP stack</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                        |   |     |
| Read:              | <b>AT**PPPAUTH?</b><br><br>Response:<br><b>PPPAUTH: &lt;auth&gt;</b><br><br><b>OK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |                        |   |     |
| Write:             | <b>AT**PPPAUTH=&lt;auth&gt;</b><br><br>Parameters:<br><b>&lt;auth&gt;:</b> <table> <tr> <td>0</td><td>no authentication type</td></tr> <tr> <td>1</td><td>PAP</td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 | no authentication type | 1 | PAP |
| 0                  | no authentication type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |                        |   |     |
| 1                  | PAP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |                        |   |     |
| <b>Note:</b>       | <b>If an authentication type has been defined, use</b> <ul style="list-style-type: none"> <li>➤ <b>AT**PPPUSE=&lt;user&gt;</b><br/><b>to transfer the user name</b></li> <li>➤ <b>AT**PPPPW=&lt;password&gt;</b> <b>to transfer the password for the user name.</b></li> </ul> <p>For the dial-up via GPRS, entering the user name and password is just a "formality". Actually ensuring the authentication takes place via the SIM card during the login into the GSM network.</p> <p>Therefore GPRS network providers provide just general information regarding if and how the user name and the password should be used.</p> <p>The GPRS network providers provide no information regarding the authentication type as the actual PPP authentication takes place only within the INSYS GPRS 5.0 serial. Only after the negotiation has taken place will the user name and the password be transferred to the network provider via GPRS protocol elements.</p> <p>In this case, the usage of PAP as authentication type is recommended.</p> <p>When dialing in via GSM, the user names and passwords defined in the ISP license agreement must be used to be able to work with the agreed ISP rate. If non-registered user names and passwords are specified, usually the highest rate is used for the online connection.</p> <p>Please refer to your ISPs documents regarding the authentication type; in general, it will be PAP (<b>AT**PPPAUTH=1</b>).</p> |   |                        |   |     |
| Delete:            | <b>AT**PPPAUTH=</b><br><br>After "=", the input line is completed with <b>&lt;CR&gt;</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |                        |   |     |
| Default:           | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                        |   |     |

|                   |                                                                                                                    |
|-------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>AT**PPPPW</b>  | <b><u>PPP password for integrated TCP/IP stack</u></b>                                                             |
| Read:             | <b>AT**PPPPW?</b><br>Response:<br><b>PPPPW: &lt;pw&gt;</b><br><b>OK</b>                                            |
| Write:            | <b>AT**PPPPW=&lt;pw&gt;</b><br>Parameters:<br><b>&lt;pw&gt;:</b> PPP password; maximum length 16 characters.       |
| Delete:           | <b>AT**PPPPW=</b><br>After "=", the input line is completed with <b>&lt;CR&gt;</b> .                               |
| Default:          | Empty                                                                                                              |
| <b>AT**PPPUSE</b> | <b><u>PPP user name for integrated TCP/IP stack</u></b>                                                            |
| Read:             | <b>AT**PPPUSE?</b><br>Response:<br><b>PPPUSE: &lt;user&gt;</b><br><b>OK</b>                                        |
| Write:            | <b>AT**PPPUSE=&lt;user&gt;</b><br>Parameters:<br><b>&lt;user&gt;:</b> PPP user name; maximum length 16 characters. |
| Delete:           | <b>AT**PPPUSE=</b><br>After "=", the input line is completed with <b>&lt;CR&gt;</b> .                              |
| Default:          | Empty                                                                                                              |

**AT\*\*PROFILE      Query of the INSYS AT command settings**

Read:

AT\*\*PROFILE?

Response:

INSYS MICROELECTRONICS  
GPRS Transparent  
SW-Version 1.00, 20.10.2005

IMEI: 355633000150

BAUD: 19200

FORMAT: 8N1

E: 1

Q: 0

V: 1

\Q: 0

&amp;C: 1

&amp;D: 2

&amp;S: 0

S0: 0

PIN: active

SCN:

LOGIN: 0

LOGOUT: 0 (0)

GSMREQ: 60

SMSRX: 1

PASSC: inactive

CLIP: inactive

CLIP 1:

CLIP 2:

CLIP 3:

DIALIN: 1

DIALINNR:

GPRSAPN:

PPPAUTH: 0

PPPUSER:

PPPPW:

VCOM: active

KEEP: 0

TCPAGG: 100

AUTOCSO:

AUTOIP: 0.0.0.0

AUTOPORTIP: 0

AUTOURL:

AUTOPORTURL: 0

CALLBACK: 0,0,0

LL: 0

OK

The settings are displayed in the same format as the query of an individual command.

**Note: This command cannot be executed via SMS.**

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT**PROVIDER</b> | <b><u>GSM network provider selection</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Read:               | <b>AT**PROVIDER?</b><br><br>Response:<br><b>PROVIDER: &lt;mode&gt; [, &lt;format&gt; [, &lt;oper&gt;]]</b><br><br><b>OK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Write:              | <b>AT**PROVIDER=&lt;mode&gt; [, &lt;format&gt; [, &lt;oper&gt;]]</b><br><br>Parameters:<br><div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <b>&lt;mode&gt;</b><br/><br/> <b>0</b><br/><br/> <b>1</b><br/><br/> <b>2</b><br/><br/> <b>4</b> </div> <div style="width: 65%;">           automatic operation; <b>&lt;oper&gt;</b> is ignored<br/>           automatic operation; <b>&lt;oper&gt;</b> is ignored<br/>           manual network provider selection;<br/> <b>&lt;oper&gt;</b> and <b>&lt;format&gt;</b> must be present;<br/>           manual logout of the network<br/>           automatic, manually pre-selected; if the manual<br/>           login at provider <b>&lt;oper&gt;</b> fails, the automatic operation is used         </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%;"> <b>&lt;format&gt;</b><br/><br/> <b>2</b> </div> <div style="width: 65%;">           numerical format for <b>&lt;oper&gt;</b>: <i>GSM Location Area Identification Number</i>; 5-digit, unique identifier of a network provider         </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%;"> <b>&lt;oper&gt;</b> </div> <div style="width: 65%;">           Network provider information<br/>           (see Chapt. 11 "Network Provider Identification Numbers" )         </div> </div> <div style="margin-top: 20px;"> <b>Note:</b>      <b>This command corresponds with the command AT+COPS of the GSM/GPRS engine. It is managed as string by the µcontroller and is handed over to the GSM/GPRS engine for login when initializing the INSYS GPRS 5.0 serial. Benefit: AT**PROVIDER may also be configured remotely and via SMS to be able to make necessary changes on location.</b> </div> |
| <b>AT**RESET</b>    | <b><u>Device reset</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Write:              | <b>AT**RESET</b><br><br>When entered correctly, the INSYS GPRS 5.0 serial will restart. After a reset, the previously stored values are re-loaded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AT**SAVE</b>     | <b><u>Save the extended INSYS settings</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Write:              | <b>AT**SAVE</b><br><br>The extended INSYS settings will be saved in the non-volatile memory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



**AT\*\*SCN**      **SMS service center number**Read:      **AT\*\*SCN?**

Response:

**SCN: <number>**

OK

Write:      **AT\*\*SCN=<number>**

Parameters:

**<number>**      SMS service center number of the GSM provider. If no service center number has been specified, the number that is stored on the SIM card is used for sending SMS. The number should be stored in international format +49... to ensure the SMS dispatch when roaming (example Germany: +49...). (max. 20 digits)

**Note:**      **A list with access numbers of several network providers is provided in Chapter 9.**

Delete:      **AT\*\*SCN=**After "=", the input line is completed with **<CR>**.

Default:      Empty

**AT\*\*SIGNAL**      **GSM signal field strength**Read:      **AT\*\*SIGNAL?**

Response:

**SIGNAL: <signal>**

OK

Parameters:

**<signal>**      value of the received GSM field strength

0      -113 dBm or less

1      -111 dBm

1..30      -109 dBm ... -53 dBm (2 dB – steps)

31      -51 dBm or better

99      Field strength can not be determined

**Note:**      **Antenna locations with values below 10 should be avoided. (see also AT\*\*GSMREQ)**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   |                       |   |             |  |   |                                                                       |  |   |                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------|---|-------------|--|---|-----------------------------------------------------------------------|--|---|-----------------------------------------------------------------------------------|
| <b>AT**SMSRX</b>      | <b><u>Automatic SMS reception processing</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |                       |   |             |  |   |                                                                       |  |   |                                                                                   |
| Read:                 | <b>AT**SMSRX?</b><br>Response:<br><b>SMSRX: &lt;status&gt;</b><br>OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   |                       |   |             |  |   |                                                                       |  |   |                                                                                   |
| Write:                | <b>AT**SMSRX=&lt;status&gt;</b><br>Parameters:<br><table> <tr> <td><b>&lt;status&gt;</b></td><td>0</td><td>Deactivated</td></tr> <tr> <td></td><td>1</td><td>Activated - Each incoming SMS is deleted after it has been processed.</td></tr> <tr> <td></td><td>2</td><td>Activated - SMS not intended for the INSYS GPRS 5.0 serial are left in the buffer</td></tr> </table> <p>General:<br/>Incoming SMS messages are optionally protected with the remote configuration password.</p> <p><b>Note: see also AT**GSMREQ</b></p> <p>To <b>&lt;status&gt; 1:</b><br/>Each SMS is checked for validity (format, password, selective call acceptance). After processing, a response SMS is possibly sent, and the SMS is deleted from the storage location.</p> <p>If the SMS is not usable, it will be deleted from the SMS buffer immediately. The usage of the SMS reception by the user application is only possible in a restricted way.</p> <p><b>Note: The application must query the SMS before automatic processing starts.</b></p> <p>To <b>&lt;status&gt; 2:</b><br/>SMS which are not processed by the INSYS GPRS 5.0 stay in the buffer of the SIM card, until they are retrieved by the application via the serial interface, and deleted. When the buffer of the SIM card is full, no further SMS messages will be accepted:</p> <p>The INSYS GPRS 5.0 serial processes and deletes the following SMS:</p> <ol style="list-style-type: none"> <li>All SMS messages with correct configuration password (when set), irrespective if the password is followed by a valid command or not.</li> <li>All SMS messages with correct syntax - starting with <b>AT**</b> - if no password is set.</li> </ol> <p>If the selective call acceptance is active and the phone number is invalid, the incoming SMS is stored in the buffer.</p> |                                                                                   | <b>&lt;status&gt;</b> | 0 | Deactivated |  | 1 | Activated - Each incoming SMS is deleted after it has been processed. |  | 2 | Activated - SMS not intended for the INSYS GPRS 5.0 serial are left in the buffer |
| <b>&lt;status&gt;</b> | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Deactivated                                                                       |                       |   |             |  |   |                                                                       |  |   |                                                                                   |
|                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Activated - Each incoming SMS is deleted after it has been processed.             |                       |   |             |  |   |                                                                       |  |   |                                                                                   |
|                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Activated - SMS not intended for the INSYS GPRS 5.0 serial are left in the buffer |                       |   |             |  |   |                                                                       |  |   |                                                                                   |
| Default:              | <b>AT**SMSRX=1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   |                       |   |             |  |   |                                                                       |  |   |                                                                                   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                 |                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------|
| <b>AT**TCPAGG</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>TCP block formation time of the integrated TCP/IP stacks</b> |                                                  |
| Read:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>AT**TCPAGG?</b>                                              |                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Response:                                                       |                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>TCPAGG: &lt;agg-time&gt;</b>                                 |                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>OK</b>                                                       |                                                  |
| Write:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>AT**TCPAGG=&lt;agg-time&gt;</b>                              |                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Parameters:                                                     |                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>&lt;agg-time&gt;</b>                                         | 1...65535 To form TCP data packets in 1 ms units |
| <p>For IP-based transmission channels such as the “TCP transparent” connection, the transmitted amount of data consists not only of the sum of all user data of the application. They are rather packed into TCP/IP packets, which also generate network loads and therefore add to the total costs.</p> <p>Each TCP/IP message has a protocol overhead of 40 bytes. For each message there is also a confirmation message from the remote terminal with 40 bytes.</p> <p>It is important to select the suitable parameters for the application to form the TCP packets in the integrated TCP/IP stack; a data packet is sent to the remote terminal, if:</p> <ul style="list-style-type: none"> <li>➤ The maximum size has been reached: fixed at 512 byte</li> <li>➤ The maximum waiting time has expired: command <b>AT**TCPAGG</b>, adjustable in ms.</li> </ul> <p>The delay for the waiting time is restarted for every character incoming at the RS232 interface. When no more characters are received for the RS232 interface for the time set with <b>AT**TCPAGG</b>, a TCP packet is sent.</p> <p>Small values for <b>AT**TCPAGG</b> result in a fast transmission of short packets, but also in a higher amount of data. Large values, however, result in small data packets being delayed.</p> <p><b>Note:</b> This parameter should be selected with care to avoid sending many small packets.</p> |                                                                 |                                                  |
| Delete:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>AT**TCPAGG=</b>                                              |                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | After “=”, the input line is completed with <b>&lt;CR&gt;</b> . |                                                  |
| Default:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 100                                                             |                                                  |

|                    |                                                                 |                                                                                                                                                                                                                        |                     |
|--------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>AT**VCOM</b>    | <b><u>Support of the INSYS virtual COM port driver</u></b>      |                                                                                                                                                                                                                        |                     |
| Read:              | <b>AT**VCOM?</b>                                                |                                                                                                                                                                                                                        |                     |
|                    | Response:                                                       |                                                                                                                                                                                                                        |                     |
|                    | <b>VCOM: &lt;mode&gt;</b>                                       |                                                                                                                                                                                                                        |                     |
|                    | <b>OK</b>                                                       |                                                                                                                                                                                                                        |                     |
| Write:             | <b>AT**VCOM=&lt;mode&gt;</b>                                    |                                                                                                                                                                                                                        |                     |
|                    | Parameters:                                                     |                                                                                                                                                                                                                        |                     |
|                    | <b>&lt;mode&gt;</b>                                             | <b>0</b>                                                                                                                                                                                                               | Support deactivated |
|                    |                                                                 | <b>1</b>                                                                                                                                                                                                               | Support activated   |
|                    | <b>Note:</b>                                                    | <b>The activation is used to support the cooperation with the INSYS virtual COM port driver. For the driver description and the required settings, a special manual is available from INSYS MICROELECTRONICS GmbH.</b> |                     |
| Delete:            | <b>AT**VCOM=</b>                                                |                                                                                                                                                                                                                        |                     |
|                    | After “=”, the input line is completed with <b>&lt;CR&gt;</b> . |                                                                                                                                                                                                                        |                     |
| Default:           | <b>0</b>                                                        |                                                                                                                                                                                                                        |                     |
| <b>AT**VERSION</b> | <b><u>Query of the software version</u></b>                     |                                                                                                                                                                                                                        |                     |
| Read:              | <b>AT**VERSION?</b>                                             |                                                                                                                                                                                                                        |                     |
|                    | Response:                                                       |                                                                                                                                                                                                                        |                     |
|                    | <b>INSYS MICROELECTRONICS</b>                                   |                                                                                                                                                                                                                        |                     |
|                    | <b>GPRS transparent</b>                                         |                                                                                                                                                                                                                        |                     |
|                    | <b>SW-Version 1.00, 20.10.2005</b>                              |                                                                                                                                                                                                                        |                     |

## 3.2 AT-commands

### 3.2.1 AT commands according to V.25ter

| Command                  | Description                                                                                                                                                                                                                                   |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ATA</b>               | <u>Answer mode/manual call acceptance</u><br>The INSYS GPRS 5.0 serial is switched to answer mode.<br>See also <b>ATS0</b>                                                                                                                    |
| <b>AT&amp;C&lt;n&gt;</b> | <u>Set function type of the control line DCD</u><br><b>AT&amp;C0</b> DCD is always ON<br><b>AT&amp;C1</b> DCD displays Connect (default)                                                                                                      |
| <b>AT&amp;D&lt;n&gt;</b> | <u>Function type of the control line DTR</u><br>Set (Switch ON→Off)<br><b>AT&amp;D0</b> Ignored<br><b>AT&amp;D1</b> Change to command mode, connection maintained<br><b>AT&amp;D2</b> Change to command mode, connection terminated (default) |
| <b>ATDL</b>              | <u>Redial last CSD connection</u>                                                                                                                                                                                                             |

| Command             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ATD&lt;n&gt;</b> | <p><u>Establish connection / establish CSD connections</u></p> <p>Dialing the phone number &lt;n&gt;</p> <p><b>Additional speed dialing:</b></p> <p><b>ATDAUTOCSD or ATDS1</b><br/>Establishing a CSD connection to the phone number configured in <b>AT**AUTOCSD</b>.</p> <p><u>Establish "TCP transparent" connections</u></p> <p><b>ATD&lt;ip&gt;:&lt;port&gt;</b></p> <p><b>Parameters:</b></p> <p>&lt;ip&gt; IP address, to which the "TCP transparent" IP connection is established</p> <p>&lt;port&gt; TCP port, for which at the IP address &lt;ip&gt; the "TCP Transparent" IP connection is established. Values from 1...65535.<br/>e.g. <b>ATD213.7.0.46:1234</b></p> <p><b>ATD"&lt;domain&gt;":&lt;port&gt;</b></p> <p><b>Parameters:</b></p> <p>&lt;domain&gt; Domain name to which the "TCP transparent" connection is established (maximum length 30 characters)</p> <p>&lt;port&gt; TCP port to which the "TCP transparent" connection is established. Values from 1...65535.<br/>e.g. <b>ATD"leitstelle.dydns.org":1222</b></p> <p><b>Additional speed dialing:</b></p> <p><b>ATDAUTOIP or ATDS2</b><br/>Establishing a "TCP transparent" IP connection to the destination defined in <b>AT**AUTOIP / AT**AUTOPORTIP</b>.</p> <p><b>ATDAUTOURL or ATDS3</b><br/>Establishing a "TCP transparent" connection to the destination domain and port defined in <b>AT**AUTOURL</b> and <b>AT**AUTOPORTURL</b>.</p> <p><u>Connection setup via SMS</u></p> <p>CSD as well as "TCP transparent" connections may be established (also via speed dialing) via SMS.</p> <p>A connection which was active at the processing time is properly terminated; afterwards a connection requested via SMS is established. If a response is queried via SMS, an SMS with the content "<b>CONNECTING</b>" is returned at the moment a connection is established.</p> |
| <b>ATE&lt;n&gt;</b> | <p><u>Command entry Echo</u></p> <p>The INSYS GPRS 5.0 serial returns all entries at the serial interface.</p> <p><b>ATE0</b> Switch off Echo</p> <p><b>ATE1</b> Switch on Echo (default)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Command              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT&amp;F</b>      | <p><u>Load factory settings</u></p> <p>The factory settings are loaded. All factory settings in Chapters 6.1 and 6.2 are marked "(default)" or Default.</p> <p>Directly after that, for</p> <ul style="list-style-type: none"> <li>➤ Normally 700 ms (at 19200 bps)</li> <li>➤ 1000 ms at <b>AT**CLIP=1</b></li> </ul> <p>no entry of <b>AT</b> commands is possible.</p> <p><b>Note:</b>     <b>The factory settings of the INSYS AT** commands are loaded with AT**DEFAULT.</b></p> <p>              <b>If this behavior causes problems, this waiting time can, within reasonable limits, be reduced according to the application, using the command AT**CMDWAIT. More information on this topic is available on request from INSYS MICROELECTRONICS GmbH.</b></p>                                                       |
| <b>ATH</b>           | <p><u>Terminate connection</u></p> <ul style="list-style-type: none"> <li>➤ Terminate CSD connections</li> <li>➤ Terminate voice connections</li> </ul> <p><b>Note: No switching into command mode required</b></p> <ul style="list-style-type: none"> <li>➤ Terminate "TCP transparent" connections</li> </ul> <p>Starting with the proper termination of the TCP connection to the remote terminal, all activate protocol stacks are closed. The GPRS connection is terminated as well, e.g. after the connection was ended, the provider starts the calculation for the transmitted data volume, rounded to the next full billing unit.</p> <p><b>Note:</b>     <b>Before the connection can be terminated, switching to online command mode is required for data connections („+++“ or DTR-Drop for AT&amp;D1).</b></p> |
| <b>ATI</b>           | <u>Output of product information of the GSM/GPRS engine</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ATO</b>           | <u>Return to online data mode</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ATQ&lt;n&gt;</b>  | <p><u>Quiet control</u></p> <p>This command toggles sending messages to the PC on and off.</p> <p><b>ATQ0</b>           Send messages to application (default)</p> <p><b>ATQ1</b>           Don't send messages to application</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AT\Q&lt;n&gt;</b> | <p><u>Data flow control of the serial interface</u></p> <p><b>AT\Q0</b>           Off (default)</p> <p><b>AT\Q3</b>           Hardware handshake (RTS/CTS)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Command                  | Description                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ATS0=&lt;n&gt;</b>    | <p><u>Automatic call acceptance</u></p> <p>&lt;n&gt;     0            Function inactive<br/>                1 . . . n     Ring tones until automatic call acceptance occurs</p> <p><b>Note:</b>    In contrast to earlier versions, setting the ring tones until the call acceptance (S0 registry) with the command <b>ATS0=&lt;ringtone&gt;</b> can only be performed after a valid PIN was entered.</p>           |
| <b>AT&amp;S&lt;n&gt;</b> | <p><u>Sets function type of the control line DSR</u></p> <p><b>AT&amp;S0</b>            DSR always ON (default)<br/> <b>AT&amp;S1</b>            DSR follows DCD</p>                                                                                                                                                                                                                                                |
| <b>ATV&lt;n&gt;</b>      | <p><u>Format of modem messages</u></p> <p>This command determines if the modem transmits messages to the application in short or long format.</p> <p><b>ATV0</b>            Messages only in short format, i.e. only the error number<br/> <b>ATV1</b>            Messages in long format, e.g. the error text (default)</p>                                                                                        |
| <b>AT&amp;V</b>          | <p><u>Display configurations</u></p> <p>This command results in the display of the AT commands (V.25ter) in the active configuration.</p> <p><b>Note:</b>    The settings for ATE, ATQ, ATV, AT\Q, AT&amp;C, AT&amp;D, AT&amp;S, ATS0 , AT+IFC will not match the actual values for AT&amp;V.<br/>                The settings of the actual values and all INSYS AT** commands are displayed with AT**PROFILE.</p> |
| <b>AT&amp;W</b>          | <p><u>Save configuration</u></p> <p>The command saves the current modem configuration.</p> <p><b>Note:</b>    The INSYS AT** command settings are saved with AT**SAVE.</p>                                                                                                                                                                                                                                          |



| Command                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------|--|---|------------------------------------------------------------------------------|--|---|---------------------------------------------------------------------------|--|---|---------------------------------------------------------------------------|--|---|------------------------------------------------------------------------|
| ATX<n>                  | <p><u>CONNECT response format and connection monitoring</u></p> <table><tr><td>&lt;n&gt;</td><td>0</td><td>Numerical response for <b>CONNECT</b>, no dial tone detection, no busy detection</td></tr><tr><td></td><td>1</td><td>Text response for <b>CONNECT</b>, no dial tone detection, no busy detection</td></tr><tr><td></td><td>2</td><td>Text response for <b>CONNECT</b>, dial tone detection, no busy detection</td></tr><tr><td></td><td>3</td><td>Text response for <b>CONNECT</b>, no dial tone detection, busy detection</td></tr><tr><td></td><td>4</td><td>Text response for <b>CONNECT</b>, dial tone detection, busy detection</td></tr></table>                                                                                                   | <n>                                                                               | 0 | Numerical response for <b>CONNECT</b> , no dial tone detection, no busy detection |  | 1 | Text response for <b>CONNECT</b> , no dial tone detection, no busy detection |  | 2 | Text response for <b>CONNECT</b> , dial tone detection, no busy detection |  | 3 | Text response for <b>CONNECT</b> , no dial tone detection, busy detection |  | 4 | Text response for <b>CONNECT</b> , dial tone detection, busy detection |
| <n>                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Numerical response for <b>CONNECT</b> , no dial tone detection, no busy detection |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
|                         | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Text response for <b>CONNECT</b> , no dial tone detection, no busy detection      |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
|                         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Text response for <b>CONNECT</b> , dial tone detection, no busy detection         |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
|                         | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Text response for <b>CONNECT</b> , no dial tone detection, busy detection         |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
|                         | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Text response for <b>CONNECT</b> , dial tone detection, busy detection            |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
| ATZ                     | <p><u>Software reset/load default</u></p> <p>All current parameters - not INSYS <b>AT**</b> commands - are reset to the values saved in the user profile.</p> <p>Directly after that, for</p> <ul style="list-style-type: none"><li>➤ Normally 700 ms (at 19200 bps)</li><li>➤ 1000 ms at <b>AT**CLIP=1</b></li></ul> <p>no entry of <b>AT</b> commands is possible.</p> <p>If this behavior causes problems, this waiting time can, within reasonable limits, be reduced according to the application, using the command <b>AT**CMDWAIT</b>. More information on this topic is available on request from INSYS MICROELECTRONICS GmbH.</p> <p><b>Note:</b>     <b>The INSYS AT**commands are reloaded after each restart (e.g. after the command AT*RESET).</b></p> |                                                                                   |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
| <Pause> +++<br><Pause>  | <p><u>Change from data mode to command mode (online command mode).</u></p> <p>1 second pause before and after the entry, no &lt;CR&gt; .</p> <p>Response “OK”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |
| <Pause> ****<br><Pause> | <p><u>Remote configuration</u></p> <p>After the 4 escape characters were entered at the local device (1 second pause before and after the entry, no return - &lt;CR&gt; -), the remote configuration at the remote terminal is activated. The data connection is maintained in the background. The 4 escape characters must be entered within 1 second.</p> <p>Response “OK”</p> <p><b>Note:</b>     <b>See also Chapter 2.1 "Short description of the AT commands". The remote configuration mode is ended with AT**EXIT.</b></p>                                                                                                                                                                                                                                  |                                                                                   |   |                                                                                   |  |   |                                                                              |  |   |                                                                           |  |   |                                                                           |  |   |                                                                        |

### 3.2.2 AT-Befehle für GSM-Verbindung

| Command                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AT+CBST?                                 | <u>Queries the transmission service type</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| AT+CBST=<n>                              | <u>Sets transmission service type to modem and ISDN TA</u><br><br><div> <div>&lt;n&gt;</div> <div> 0          auto bauding<br/> 1          300 bps (V.21) - analogue<br/> 2          1,200 bps (V.22) - analogue<br/> 4          2,400 bps (V.22bis) - analogue<br/> 6          4,800 bps (V.32) - analogue<br/> 7          9,600 bps (V.32) – analogue - (default)<br/> 14        14,400 bps (V.34) - analogue<br/> 65        300 bps (V.110) - ISDN<br/> 66        1,200 bps (V.110) - ISDN<br/> 68        2,400 bps (V.110) - ISDN<br/> 70        4,800 bps (V.110) - ISDN<br/> 71        9,600 bps (V.110) - ISDN<br/> 75        14,400 bps (V.110) - ISDN </div> </div>                                                                                                                                                                                                      |
| AT+COPS?                                 | <u>Display selected network provider</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| AT+COPS=<mode><br>[,<format>,<br><oper>] | <u>Select network provider and login</u><br><br>Parameters:<br><div> <div>&lt;mode&gt;</div> <div> Empty      automatic operation; &lt;oper&gt; is ignored<br/> 0          automatic operation; &lt;oper&gt; is ignored<br/> 1          Manual network provider selection;<br/>             &lt;oper&gt; and &lt;format&gt; must be present;<br/> 2          manual logout of the network<br/> 4          automatic, manually pre-selected; if the manual login<br/>             at the provider &lt;oper&gt; fails, automatic operation is<br/>             used<br/><br/> &lt;format&gt;      2          Numerical information for &lt;oper&gt;<br/><br/> &lt;oper&gt;          Network provider information<br/>                  (see Chapt. 11 "Network Provider Identification<br/>                  Numbers" )<br/><br/> <b>Note: See also AT**PROVIDER.</b> </div> </div> |

| Command     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------------|---------------------------------------|------------------------------|-----------|---------------------------------|----|----------------|------------------------------------|----------------|---|---------|--|---|---------------------|
| AT+CPIN?    | <u>Query required password</u><br><br>Response (example):<br><b>READY</b> No input required<br><b>SIM PIN</b> Enter SIM card PIN<br><b>SIM PUK</b> Enter PUK of the SIM card (after repeated false entry of the PIN)                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
| AT+CPIN=<n> | <u>Enter SIM card PIN</u><br><br><n>                      4 digit number<br><br>After the PIN was entered, the INSYS GPRS 5.0 serial must be logged in with <b>AT+COPS=&lt;n&gt; [, &lt;format&gt;, &lt;oper&gt;]</b> .<br><br>After repeated false entries the PUK must be typed in.<br>To type in the PUK use the following command:<br><b>AT+CPIN=&lt;PUK&gt;, &lt;new PIN&gt;</b><br><br>The PIN is permanently stored in the controller with the extended command <b>AT**PIN</b> .                                                                                                                                                                               |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
| AT+CREG?    | <u>Display registration state (network state)</u><br><br>Response: <n>,<stat><br><br>Parameters:<br><table><tr><td>&lt;stat&gt;</td><td>0</td><td>Not registered, no GSM network search</td></tr><tr><td></td><td>1</td><td>Registered at standard provider</td></tr><tr><td></td><td>2</td><td>Not registered, GSM network search</td></tr><tr><td></td><td>3</td><td>Refused</td></tr><tr><td></td><td>5</td><td>Registered, roaming</td></tr></table>                                                                                                                                                                                                              | <stat>                                | 0                                        | Not registered, no GSM network search |                              | 1         | Registered at standard provider |    | 2              | Not registered, GSM network search |                | 3 | Refused |  | 5 | Registered, roaming |
| <stat>      | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Not registered, no GSM network search |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
|             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Registered at standard provider       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
|             | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Not registered, GSM network search    |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
|             | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Refused                               |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
|             | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Registered, roaming                   |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
| AT+CSQ      | <u>Display signal quality (intensity of the GSM signal)</u><br><br>Response: <rssi>,<ber><br><br>Parameters:<br><table><tr><td>&lt;rssi&gt;</td><td>value of the received GSM field strength</td></tr><tr><td>0 . . 10</td><td>Poor signal, change location</td></tr><tr><td>11 . . 31</td><td>Good signal</td></tr><tr><td>99</td><td>Not detectable</td></tr></table> <p><b>Note:    Antenna locations with values below 10 should be avoided. See also AT**SIGNAL.</b></p><br><table><tr><td>&lt;ber&gt;</td><td>Bit error rate</td></tr></table><br>The bit error rate is only measured during an existing connection. Otherwise the values 0 or 99 are returned. | <rssi>                                | value of the received GSM field strength | 0 . . 10                              | Poor signal, change location | 11 . . 31 | Good signal                     | 99 | Not detectable | <ber>                              | Bit error rate |   |         |  |   |                     |
| <rssi>      | value of the received GSM field strength                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
| 0 . . 10    | Poor signal, change location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
| 11 . . 31   | Good signal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
| 99          | Not detectable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |
| <ber>       | Bit error rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       |                                          |                                       |                              |           |                                 |    |                |                                    |                |   |         |  |   |                     |

### 3.2.3 AT commands for SMS

| Command                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AT+CBST?                                 | <u>Queries the transmission service type</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| AT+CBST=<n>                              | <u>Sets transmission service type to modem and ISDN TA</u><br><br><div> <div>&lt;n&gt;</div> <div> 0          auto bauding<br/> 1          300 bps (V.21) - analogue<br/> 2          1,200 bps (V.22) - analogue<br/> 4          2,400 bps (V.22bis) - analogue<br/> 6          4,800 bps (V.32) - analogue<br/> 7          9,600 bps (V.32) – analogue - (default)<br/> 14        14,400 bps (V.34) - analogue<br/> 65        300 bps (V.110) - ISDN<br/> 66        1,200 bps (V.110) - ISDN<br/> 68        2,400 bps (V.110) - ISDN<br/> 70        4,800 bps (V.110) - ISDN<br/> 71        9,600 bps (V.110) - ISDN<br/> 75        14,400 bps (V.110) - ISDN </div> </div>                                                                                                                                                               |
| AT+COPS?                                 | <u>Display selected network provider</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AT+COPS=<mode><br>[,<format>,<br><oper>] | <u>Select network provider and login</u><br><br>Parameters:<br><div> <div>&lt;mode&gt;</div> <div> Empty    automatic operation; &lt;oper&gt; is ignored<br/> 0        automatic operation; &lt;oper&gt; is ignored<br/> 1        Manual network provider selection;<br/>          &lt;oper&gt; and &lt;format&gt; must be present;<br/> 2        manual logout of the network<br/> 4        automatic, manually pre-selected; if the manual login<br/>          at the provider &lt;oper&gt; fails, automatic operation is<br/>          used<br/><br/> &lt;format&gt;    2          Numerical information for &lt;oper&gt;<br/><br/> &lt;oper&gt;        Network provider information<br/>          (see Chapt. 11 "Network Provider Identification<br/>          Numbers" )<br/><br/> <b>Note: See also AT**PROVIDER.</b> </div> </div> |

| Command     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AT+CPIN?    | <u>Query required password</u><br><br>Response (example):<br><div>READYNo input required</div> <div>SIM PINEnter SIM card PIN</div> <div>SIM PUKEnter PUK of the SIM card (after repeated false entry of the PIN)</div>                                                                                                                                                                                                                                                                                                                        |
| AT+CPIN=<n> | <u>Enter SIM card PIN</u><br><br><n>4 digit number<br><br>After the PIN was entered, the INSYS GPRS 5.0 serial must be logged in with AT+COPS=<n> [, <format>, <oper>].<br><br>After repeated false entries the PUK must be typed in.<br>To type in the PUK use the following command:<br>AT+CPIN=<PUK>, <new PIN><br><br>The PIN is permanently stored in the controller with the extended command AT**PIN.                                                                                                                                   |
| AT+CREG?    | <u>Display registration state (network state)</u><br><br>Response: <n>,<stat><br><br>Parameters:<br><div>&lt;stat&gt;0Not registered, no GSM network search</div> <div>1Registered at standard provider</div> <div>2Not registered, GSM network search</div> <div>3Refused</div> <div>5Registered, roaming</div>                                                                                                                                                                                                                               |
| AT+CSQ      | <u>Display signal quality (intensity of the GSM signal)</u><br><br>Response: <rssi>,<ber><br><br>Parameters:<br><div>&lt;rssi&gt;value of the received GSM field strength</div> <div>0..10Poor signal, change location</div> <div>11..31Good signal</div> <div>99Not detectable</div> <div>Note: Antenna locations with values below 10 should be avoided. See also AT**SIGNAL.</div><br><div>&lt;ber&gt;Bit error rate</div><br>The bit error rate is only measured during an existing connection. Otherwise the values 0 or 99 are returned. |

### 3.2.4 AT commands for GPRS

| Command                                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT+CGATT?</b>                                                      | <u>Display GPRS registration state (attach and detach)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AT+CGATT=&lt;state&gt;</b>                                         | <u>GPRS registration (attach and detach)</u><br><br>Parameters:<br><state>    0    Detach(ed)- not registered (default)<br>1    Attach(ed) - registered                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AT+CGACT?</b>                                                      | <u>PDP context state (active or inactive)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AT+CGACT= [&lt;state&gt; [,&lt;cid&gt; [,&lt;cid&gt; [,...]]]]</b> | <u>Activate/deactivate PDP context</u><br><br>Parameters:<br><state>    0    PDP context indicated with <cid> deactivated (default)<br>1    PDP context indicated with <cid> activated<br><br><cid>       Index of a defined PDP context (see <b>AT+CGDCONT</b> ) which is activated/deactivated.                                                                                                                                                                                                                        |
| <b>AT+CGDATA= [&lt;L2P&gt; [,&lt;cid&gt; [,&lt;cid&gt; [,...]]]]</b>  | <u>Start GPRS connection</u><br><br>Parameters:<br><L2P>       Layer 2 protocol betw. application and GPRS engine<br>1    PPP<br><br><cid>       Index of a defined PDP context (see <b>AT+CGDCONT</b> ) which will be activated/deactivated<br><br>If the command can be successfully executed, the data mode will be active with the message " <b>CONNECT</b> " and the control line DCD. To maintain a modem-compatible connection setup, a GPRS connection setup may also be performed with the command <b>ATD</b> . |
| <b>AT+CGDCONT?</b>                                                    | <u>Read PDP context</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Command                                                                                                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT+CGDCONT= [&lt;cid&gt;<br/> [,&lt;PDP_type&gt;<br/> [,&lt;APN&gt;<br/> [,&lt;PDP_addr&gt;]]]]</b> | <u>Define PDP context</u><br><br>Parameters:<br><cid>        Index which defines the according PDP context in connection with other AT commands that use the PDP context.<br><div style="margin-left: 40px;"> 1        PDP context 1<br/> 2        PDP context 2 </div> <PDP_type>    Packet transmission protocol type<br><div style="margin-left: 40px;"> <b>IP</b>    Internet Protocol </div> <APN>        Access point name as character string. Must be written in quotation marks.<br><PDP_addr>    String that indicates with which address the GPRS end device can be identified (IP V4 address at PDP type IP). If the value is omitted, the application can enter it during the PDP start procedure or a dynamic IP address is requested.<br><br><b>Note:        Entering AT&amp;F or ATZ will set all inactive contexts to undefined. The setting is not stored with AT&amp;W.</b> |
| <b>AT+CGQMIN?</b>                                                                                      | <u>Display Quality of Service profile (minimum acceptable)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Command                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
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| <pre>AT+CGQMIN=[&lt;cid&gt; [,&lt;precedence&gt; [,&lt;delay&gt; [,&lt;reliability&gt; [,&lt;peak&gt; [,&lt;mean&gt;]]]]]</pre> | <p>Define Quality of Service profile (minimum acceptable)</p> <p>The GPRS connection will only be established if all requirements on the provider regarding this end device QoS profile are at least supported by the provider.</p> <p>Parameters:</p> <p><b>&lt;cid&gt;</b> Index of a defined PDP context (see <b>AT+CGDCONT</b>) for which this minimum profile should apply.</p> <p><b>&lt;precedence&gt;</b> Priority class</p> <table> <tr> <td>0</td><td>Offered by provider</td></tr> <tr> <td>1</td><td>High priority; connections should be maintained via priority classes 2 and 3.</td></tr> <tr> <td>2</td><td>Normal priority; connections should be maintained via priority class 3.</td></tr> <tr> <td>3</td><td>Low priority; connections should be maintained (without committing to a priority class)</td></tr> </table> <p><b>&lt;delay&gt;</b> Delay class</p> <table> <tr> <td>0</td><td>Offered by provider</td></tr> <tr> <td></td><td><b>Medium delay time      95% of the packets within the time</b></td></tr> <tr> <td>1</td><td>&lt; 0.5 s      &lt; 1.5 s</td></tr> <tr> <td>2</td><td>&lt; 5 s      &lt; 25 s</td></tr> <tr> <td>3</td><td>&lt; 50 s      &lt; 250 s</td></tr> <tr> <td>4</td><td>Not specified Not specified</td></tr> </table> <p>This parameter defines the end-to-end delay time by the <i>GPRS network</i>.</p> <p><b>&lt;reliability&gt;</b> Reliability class</p> <table> <tr> <td>0</td><td>Offered by provider</td></tr> <tr> <td>1</td><td>No real time data; error-sensitive application that cannot handle data loss.</td></tr> <tr> <td>2</td><td>No real time data; error-sensitive application that can handle irregular data loss.</td></tr> <tr> <td>3</td><td>No real time data; error-sensitive application that can handle data loss.</td></tr> <tr> <td>4</td><td>Real time data; error-sensitive application that can handle data loss.</td></tr> <tr> <td>5</td><td>No real time data; non-error-sensitive application that can handle data loss.</td></tr> </table> | 0 | Offered by provider | 1 | High priority; connections should be maintained via priority classes 2 and 3. | 2 | Normal priority; connections should be maintained via priority class 3. | 3 | Low priority; connections should be maintained (without committing to a priority class) | 0 | Offered by provider |  | <b>Medium delay time      95% of the packets within the time</b> | 1 | < 0.5 s      < 1.5 s | 2 | < 5 s      < 25 s | 3 | < 50 s      < 250 s | 4 | Not specified Not specified | 0 | Offered by provider | 1 | No real time data; error-sensitive application that cannot handle data loss. | 2 | No real time data; error-sensitive application that can handle irregular data loss. | 3 | No real time data; error-sensitive application that can handle data loss. | 4 | Real time data; error-sensitive application that can handle data loss. | 5 | No real time data; non-error-sensitive application that can handle data loss. |
| 0                                                                                                                               | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 1                                                                                                                               | High priority; connections should be maintained via priority classes 2 and 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 2                                                                                                                               | Normal priority; connections should be maintained via priority class 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 3                                                                                                                               | Low priority; connections should be maintained (without committing to a priority class)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 0                                                                                                                               | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
|                                                                                                                                 | <b>Medium delay time      95% of the packets within the time</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 1                                                                                                                               | < 0.5 s      < 1.5 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 2                                                                                                                               | < 5 s      < 25 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 3                                                                                                                               | < 50 s      < 250 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 4                                                                                                                               | Not specified Not specified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 0                                                                                                                               | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 1                                                                                                                               | No real time data; error-sensitive application that cannot handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 2                                                                                                                               | No real time data; error-sensitive application that can handle irregular data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 3                                                                                                                               | No real time data; error-sensitive application that can handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 4                                                                                                                               | Real time data; error-sensitive application that can handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 5                                                                                                                               | No real time data; non-error-sensitive application that can handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |



| Command                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT+CGQMIN=</b> [<cid><br>[, <precedence><br>[, <delay><br>[, <reliability><br>[, <peak><br>[, <mean>]]]]]]<br>(Continuation) | <div> <div> <b>&lt;peak&gt;</b> Peak capacity class </div> <div> 0    Offered by provider<br/> 1    Up to 8 kbps<br/> 2    Up to 16 kbps<br/> 3    Up to 32 kbps<br/> 4    Up to 64 kbps<br/> 5    Up to 128 kbps<br/> 6    Up to 256 kbps<br/> 7    Up to 512 kbps<br/> 8    Up to 1024 kbps<br/> 9    Up to 2048 kbps </div> </div> <div> <div> <b>&lt;mean&gt;</b> Mean output class </div> <div> 0    Offered by provider<br/> 1    100 byte/hour (~ 0.22 bps)<br/> 2    200 byte/hour (~ 0.44 bps)<br/> 3    500 byte/hour (~ 1.11 bps)<br/> 4    1000 byte/hour (~ 2.2 bps)<br/> 5    2000 byte/hour (~ 4.4 bps)<br/> 6    5000 byte/hour (~ 11.1 bps)<br/> 7    10,000 byte/hour (~ 22 bps)<br/> 8    20,000 byte/hour (~ 44 bps)<br/> 9    50,000 byte/hour (~ 111 bps)<br/> 10    100,000 byte/hour (~ 0.22 kbps)<br/> 11    200,000 byte/hour (~ 0.44 kbps)<br/> 12    500,000 byte/hour (~ 1.11 kbps)<br/> 13    1,000,000 byte/hour (~ 2.2 kbps)<br/> 14    2,000,000 byte/hour (~ 4.4 kbps)<br/> 15    5,000,000 byte/hour (~ 11.1 kbps)<br/> 16    10,000,000 byte/hour (~ 22 kbps)<br/> 17    20,000,000 byte/hour (~ 44 kbps)<br/> 18    50,000,000 byte/hour (~ 111 kbps)<br/> 31    Best value </div> </div> <p>           If no parameters are specified they are reset to the default values allocated to the SIM contract.<br/>           If the minimum requirement check will be deactivated, only <b>AT+CGQMIN=&lt;cid&gt;</b> must be entered. The same effect will occur when entering <b>AT&amp;F</b> or <b>ATZ</b>.<br/> <b>Note: The setting is not stored with AT&amp;W.</b> </p> |
| <b>AT+CGQREQ?</b>                                                                                                               | <u>Display Quality of Service profile (requested)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Command                                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
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| <b>AT+CGQREQ=</b> [<cid><br>[,<precedence><br>[,<delay><br>[,<reliability><br>[,<peak><br>[,<mean>]]]]]] | <p><u>Define Quality of Service profile (requested)</u></p> <p>This command will allow the application to request a certain QoS from the provider. These values should be larger than the values of the minimum profile (<b>AT+CGQMIN</b>).</p> <p>Parameters:</p> <p><b>&lt;cid&gt;</b> Index of a defined PDP context (see <b>AT+CGDCONT</b>) for which this minimum profile should apply.</p> <p><b>&lt;precedence&gt;</b> Priority class</p> <table> <tr> <td>0</td><td>Offered by provider</td></tr> <tr> <td>1</td><td>High priority; connections should be maintained via priority classes 2 and 3.</td></tr> <tr> <td>2</td><td>Normal priority; connections should be maintained via priority class 3.</td></tr> <tr> <td>3</td><td>Low priority; connections should be maintained (without committing to a priority class)</td></tr> </table> <p><b>&lt;delay&gt;</b> Delay class</p> <table> <tr> <td>0</td><td>Offered by provider</td></tr> <tr> <td></td><td><b>Medium delay time      95% of the packets within the time</b></td></tr> <tr> <td>1</td><td>&lt; 0.5 s      &lt; 1.5 s</td></tr> <tr> <td>2</td><td>&lt; 5 s      &lt; 25 s</td></tr> <tr> <td>3</td><td>&lt; 50 s      &lt; 250 s</td></tr> <tr> <td>4</td><td>Not specified Not specified</td></tr> </table> <p>This parameter defines the end-to-end delay time by the <i>GPRS network</i>.</p> <p><b>&lt;reliability&gt;</b> Reliability class</p> <table> <tr> <td>0</td><td>Offered by provider</td></tr> <tr> <td>1</td><td>No real time data; error-sensitive application that cannot handle data loss.</td></tr> <tr> <td>2</td><td>No real time data; error-sensitive application that can handle irregular data loss.</td></tr> <tr> <td>3</td><td>No real time data; error-sensitive application that can handle data loss.</td></tr> <tr> <td>4</td><td>Real time data; error-sensitive application that can handle data loss.</td></tr> <tr> <td>5</td><td>No real time data; non-error-sensitive application that can handle data loss.</td></tr> </table> | 0 | Offered by provider | 1 | High priority; connections should be maintained via priority classes 2 and 3. | 2 | Normal priority; connections should be maintained via priority class 3. | 3 | Low priority; connections should be maintained (without committing to a priority class) | 0 | Offered by provider |  | <b>Medium delay time      95% of the packets within the time</b> | 1 | < 0.5 s      < 1.5 s | 2 | < 5 s      < 25 s | 3 | < 50 s      < 250 s | 4 | Not specified Not specified | 0 | Offered by provider | 1 | No real time data; error-sensitive application that cannot handle data loss. | 2 | No real time data; error-sensitive application that can handle irregular data loss. | 3 | No real time data; error-sensitive application that can handle data loss. | 4 | Real time data; error-sensitive application that can handle data loss. | 5 | No real time data; non-error-sensitive application that can handle data loss. |
| 0                                                                                                        | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 1                                                                                                        | High priority; connections should be maintained via priority classes 2 and 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 2                                                                                                        | Normal priority; connections should be maintained via priority class 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 3                                                                                                        | Low priority; connections should be maintained (without committing to a priority class)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 0                                                                                                        | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
|                                                                                                          | <b>Medium delay time      95% of the packets within the time</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 1                                                                                                        | < 0.5 s      < 1.5 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 2                                                                                                        | < 5 s      < 25 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 3                                                                                                        | < 50 s      < 250 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 4                                                                                                        | Not specified Not specified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 0                                                                                                        | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 1                                                                                                        | No real time data; error-sensitive application that cannot handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 2                                                                                                        | No real time data; error-sensitive application that can handle irregular data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 3                                                                                                        | No real time data; error-sensitive application that can handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 4                                                                                                        | Real time data; error-sensitive application that can handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |
| 5                                                                                                        | No real time data; non-error-sensitive application that can handle data loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |                     |   |                                                                               |   |                                                                         |   |                                                                                         |   |                     |  |                                                                  |   |                      |   |                   |   |                     |   |                             |   |                     |   |                                                                              |   |                                                                                     |   |                                                                           |   |                                                                        |   |                                                                               |

| Command                                                                                                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
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| <b>AT+CGQREQ=</b> [<cid><br>[, <precedence><br>[, <delay><br>[, <reliability><br>[, <peak><br>[, <mean>]]]]]<br>(Continuation) | <p><b>&lt;peak&gt;</b>      Peak capacity class</p> <table> <tr><td>0</td><td>Offered by provider</td></tr> <tr><td>1</td><td>Up to 8 kbps</td></tr> <tr><td>2</td><td>Up to 16 kbps</td></tr> <tr><td>3</td><td>Up to 32 kbps</td></tr> <tr><td>4</td><td>Up to 64 kbps</td></tr> <tr><td>5</td><td>Up to 128 kbps</td></tr> <tr><td>6</td><td>Up to 256 kbps</td></tr> <tr><td>7</td><td>Up to 512 kbps</td></tr> <tr><td>8</td><td>Up to 1024 kbps</td></tr> <tr><td>9</td><td>Up to 2048 kbps</td></tr> </table> <p><b>&lt;mean&gt;</b>      Mean output class</p> <table> <tr><td>0</td><td>Offered by provider</td></tr> <tr><td>1</td><td>100 byte/hour (~ 0.22 bps)</td></tr> <tr><td>2</td><td>200 byte/hour (~ 0.44 bps)</td></tr> <tr><td>3</td><td>500 byte/hour (~ 1.11 bps)</td></tr> <tr><td>4</td><td>1000 byte/hour (~ 2.2 bps)</td></tr> <tr><td>5</td><td>2000 byte/hour (~ 4.4 bps)</td></tr> <tr><td>6</td><td>5000 byte/hour (~ 11.1 bps)</td></tr> <tr><td>7</td><td>10,000 byte/hour (~ 22 bps)</td></tr> <tr><td>8</td><td>20,000 byte/hour (~ 44 bps)</td></tr> <tr><td>9</td><td>50,000 byte/hour (~ 111 bps)</td></tr> <tr><td>10</td><td>100,000 byte/hour (~ 0.22 kbps)</td></tr> <tr><td>11</td><td>200,000 byte/hour (~ 0.44 kbps)</td></tr> <tr><td>12</td><td>500,000 byte/hour (~ 1.11 kbps)</td></tr> <tr><td>13</td><td>1,000,000 byte/hour (~ 2.2 kbps)</td></tr> <tr><td>14</td><td>2,000,000 byte/hour (~ 4.4 kbps)</td></tr> <tr><td>15</td><td>5,000,000 byte/hour (~ 11.1 kbps)</td></tr> <tr><td>16</td><td>10,000,000 byte/hour (~ 22 kbps)</td></tr> <tr><td>17</td><td>20,000,000 byte/hour (~ 44 kbps)</td></tr> <tr><td>18</td><td>50,000,000 byte/hour (~ 111 kbps)</td></tr> <tr><td>31</td><td>Best value</td></tr> </table> <p>If no parameters are specified they are reset to the default values allocated to the SIM contract.<br/>           If the minimum requirement check should be deactivated, only <b>AT+CGQREQ=&lt;cid&gt;</b> must be entered.</p> <p>The same effect will occur when entering <b>AT&amp;F</b> or <b>ATZ</b></p> <p><b>Note: The setting is not stored with AT&amp;W.</b></p> | 0 | Offered by provider | 1 | Up to 8 kbps | 2 | Up to 16 kbps | 3 | Up to 32 kbps | 4 | Up to 64 kbps | 5 | Up to 128 kbps | 6 | Up to 256 kbps | 7 | Up to 512 kbps | 8 | Up to 1024 kbps | 9 | Up to 2048 kbps | 0 | Offered by provider | 1 | 100 byte/hour (~ 0.22 bps) | 2 | 200 byte/hour (~ 0.44 bps) | 3 | 500 byte/hour (~ 1.11 bps) | 4 | 1000 byte/hour (~ 2.2 bps) | 5 | 2000 byte/hour (~ 4.4 bps) | 6 | 5000 byte/hour (~ 11.1 bps) | 7 | 10,000 byte/hour (~ 22 bps) | 8 | 20,000 byte/hour (~ 44 bps) | 9 | 50,000 byte/hour (~ 111 bps) | 10 | 100,000 byte/hour (~ 0.22 kbps) | 11 | 200,000 byte/hour (~ 0.44 kbps) | 12 | 500,000 byte/hour (~ 1.11 kbps) | 13 | 1,000,000 byte/hour (~ 2.2 kbps) | 14 | 2,000,000 byte/hour (~ 4.4 kbps) | 15 | 5,000,000 byte/hour (~ 11.1 kbps) | 16 | 10,000,000 byte/hour (~ 22 kbps) | 17 | 20,000,000 byte/hour (~ 44 kbps) | 18 | 50,000,000 byte/hour (~ 111 kbps) | 31 | Best value |
| 0                                                                                                                              | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 1                                                                                                                              | Up to 8 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 2                                                                                                                              | Up to 16 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 3                                                                                                                              | Up to 32 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 4                                                                                                                              | Up to 64 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 5                                                                                                                              | Up to 128 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 6                                                                                                                              | Up to 256 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 7                                                                                                                              | Up to 512 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 8                                                                                                                              | Up to 1024 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 9                                                                                                                              | Up to 2048 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 0                                                                                                                              | Offered by provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 1                                                                                                                              | 100 byte/hour (~ 0.22 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 2                                                                                                                              | 200 byte/hour (~ 0.44 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 3                                                                                                                              | 500 byte/hour (~ 1.11 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 4                                                                                                                              | 1000 byte/hour (~ 2.2 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 5                                                                                                                              | 2000 byte/hour (~ 4.4 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 6                                                                                                                              | 5000 byte/hour (~ 11.1 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 7                                                                                                                              | 10,000 byte/hour (~ 22 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 8                                                                                                                              | 20,000 byte/hour (~ 44 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 9                                                                                                                              | 50,000 byte/hour (~ 111 bps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 10                                                                                                                             | 100,000 byte/hour (~ 0.22 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 11                                                                                                                             | 200,000 byte/hour (~ 0.44 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 12                                                                                                                             | 500,000 byte/hour (~ 1.11 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 13                                                                                                                             | 1,000,000 byte/hour (~ 2.2 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 14                                                                                                                             | 2,000,000 byte/hour (~ 4.4 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 15                                                                                                                             | 5,000,000 byte/hour (~ 11.1 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 16                                                                                                                             | 10,000,000 byte/hour (~ 22 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 17                                                                                                                             | 20,000,000 byte/hour (~ 44 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 18                                                                                                                             | 50,000,000 byte/hour (~ 111 kbps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| 31                                                                                                                             | Best value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| <b>AT+CGPADDR=</b> [<cid>,<br>[<cid>[, ...]]]                                                                                  | <p><u>Display PDP address</u></p> <p>Displays &lt;PDP_addr&gt; defined with <b>AT+CGDCONT</b> of the PDP context indicated with &lt;cid&gt;.</p> <p><b>Note: The setting is not stored with AT&amp;W.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |
| <b>AT+CGREG?</b>                                                                                                               | <u>Query GPRS network registration state</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |                     |   |              |   |               |   |               |   |               |   |                |   |                |   |                |   |                 |   |                 |   |                     |   |                            |   |                            |   |                            |   |                            |   |                            |   |                             |   |                             |   |                             |   |                              |    |                                 |    |                                 |    |                                 |    |                                  |    |                                  |    |                                   |    |                                  |    |                                  |    |                                   |    |            |

| Command                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AT+CGREG=&lt;n&gt;</b>             | <p><u>Set display of the GPRS network registration state</u></p> <p>Parameters:</p> <p><b>&lt;n&gt;</b>            Non-synchronized event codes for GPRS network registration state</p> <p>                 0      No non-synchronized event codes</p> <p>                 1      Display non-synchronized event codes (only for registration state modifications)</p> <p>When querying with <b>AT+CGREG?</b> or for activated non-synchronized event codes <b>&lt;n&gt;=1</b> the following parameters are displayed:</p> <p><b>&lt;n&gt;</b>            see above</p> <p><b>&lt;stat&gt;</b>        GPRS network registration state</p> <p>                 0      Not registered, GPRS end device is not attempting to register.</p> <p>                 1      Registered in home network</p> <p>                 2      Not registered, GPRS end device is attempting to register.</p> <p>                 3      Registration not permitted by provider.</p> <p>                 4      Unknown</p> <p>                 5      Registered via roaming</p> <p><b>Note: The setting is not stored with AT&amp;W.</b></p> |
| <b>AT+CGSMS?</b>                      | <u>Display transmission path for outgoing SMS</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AT+CGSMS=&lt;servicecenter&gt;</b> | <u>Set transmission path for outgoing SMS</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AT^SGACT?</b>                      | <u>Display states of active PDP contexts</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AT^SGAUTH?</b>                     | <u>Display PPP authentication method</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AT^SGAUTH=&lt;auth&gt;</b>         | <p><u>Set PPP authentication method</u></p> <p>Parameters:</p> <p><b>&lt;auth&gt;</b>        0      No authentication</p> <p>                 1      PAP</p> <p><b>Note: The setting is not stored with AT&amp;W.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>ATD*99***&lt;cid&gt;#</b>          | <p><u>Modem-compatible GPRS connection setup</u></p> <p><b>&lt;cid&gt;</b>           Index of a defined PDP context (see <b>AT+CGDCONT</b>) which is used for the GPRS connection setup.</p> <p><b>Note:            This connection type is not transparent! In this case, the TCP/PPP stack must be provided by an application.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ATH</b>                            | <p><u>Modem-compatible GPRS connection termination</u></p> <p><b>Note:            Switching to online command mode (“+++” or DTR drop at AT&amp;D1) is required beforehand.</b></p> <p><b>As alternative, the reset input can be used to switch into online command mode (see Chapt. Fehler! Verweisquelle konnte nicht gefunden werden.)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## 4 GSM Character Set for SMS

The internal GSM character set GSM 03.38 does not match the usual ASCII character set of PCs in all positions. Therefore, the following restrictions must be observed for SMS texts.

- The underscore must be replaced by the character number 11h (hexadecimal).
- The character 00h (hexadecimal) may not be used in any case.
- Permitted text characters in SMS messages are only letters (without umlauts), digits, punctuation marks, brackets, underscore, % & \*.
- 8-bit characters (e.g. umlauts) and the characters \$ @ { } [ ] ^ ° ` ´ are not supported.
- The character @ in e-mail addresses must usually be replaced by an asterisk (\*). Some providers like e.g. KPN (Netherlands) use the exclamation mark (!) instead: name\*company.com or name!company.com

**Note:** SMS transmission is only possible by AT commands from within a terminal program or user application.

## 5 Network Provider Identification Numbers

Identifiers and names of the network providers (GSM Location Area Identification Number) for the GSM module in alphabetic order for the command

**AT\*\*PROVIDER.**

The following table can be output with the command **AT^SPLM.**

(TC 63, Version 01.012)

| Kennzahl | Netzbetreiber   | Kennzahl | Netzbetreiber                 | Kennzahl | Netzbetreiber                  |
|----------|-----------------|----------|-------------------------------|----------|--------------------------------|
| 41802    | 2               | 79502    | Altyn Asyr                    | 40446    | BPL MOBILE                     |
| 23430    | 30              | 72424    | AMAZONIA                      | 72416    | BRA BrTCelular                 |
| 23431    | 31              | 27601    | AMC - AL                      | 72415    | BRA SCTL                       |
| 23432    | 32              | 34008    | AMIGO                         | 52811    | BRU-DSTCom                     |
| 310150   | 150             | 362951   | ANT                           | 40211    | BT B-Mobile                    |
| 310170   | 170             | 36269    | ANT CURACAO TELE-<br>COM GSM  | 35002    | BTC MOBILITY LTD.              |
| 310410   | 410             | 34430    | APUA PCS ANTIGUA              | 70267    | BTL                            |
| 45703    | 45703           | 72234    | AR PERSONAL                   | 64202    | BUSAFA                         |
| 27202    | 02 - IRL        | 28010    | areeba                        | 65201    | BW MASCOM                      |
| 23210    | 3 AT            | 41702    | areeba                        | 25701    | BY VELCOM                      |
| 23806    | 3 DK            | 63402    | areeba SDN                    | 338180   | C&W                            |
| 45403    | 3 HK            | 722310   | ARG CTI Movil                 | 342600   | C&W                            |
| 22299    | 3 ITA           | 41800    | ASIACELL                      | 344920   | C&W                            |
| 24002    | 3 SE            | 41805    | ASIACELL                      | 346140   | C&W                            |
| 23420    | 3 UK            | 41820    | Atheer Iraq                   | 352110   | C&W                            |
| 45404    | 3(2G)           | 28603    | AVEA                          | 354860   | C&W                            |
| 50506    | 3TELSTRA        | 40001    | AZE - AZERCELL GSM            | 356110   | C&W                            |
| 62801    | 628 01/LIBERTIS | 20610    | B mobistar                    | 358110   | C&W                            |
| 23207    | A tele.ring     | 43604    | Babilon-M                     | 360110   | C&W                            |
| 23201    | A1              | 21803    | BA-ERONET                     | 365840   | C&W                            |
| 46668    | ACeS            | 40002    | BAKCELL GSM 2000              | 366110   | C&W                            |
| 51000    | ACeS            | 47003    | Banglalink                    | 376350   | C&W                            |
| 51511    | ACeS            | 20620    | BASE                          | 23455    | Cable & Wireless Guern-<br>sey |
| 52020    | ACeS            | 36439    | BaTelCell                     | 45618    | CAMBODIA SHI-<br>NAWATRA       |
| 41201    | AF AWCC         | 42601    | BATELCO                       | 302720   | CAN Rogers Wireless<br>Inc.    |
| 40402    | AirTel          | 25028    | Bee Line                      | 348570   | CCT Boatphone                  |
| 40403    | AirTel          | 25099    | Bee Line                      | 63089    | CD OASIS                       |
| 40410    | AirTel          | 20601    | BEL PROXIMUS                  | 61803    | Celcom GSM                     |
| 40431    | AirTel          | 61604    | BELL BENIN COMMUNI-<br>CATION | 65507    | Cell C                         |
| 40445    | AirTel          | 61302    | BF Celtel                     | 311130   | Cell One Amarillo              |
| 40449    | AirTel          | 28405    | BG GLOBUL                     | 310450   | Cell One of NE Colorado        |
| 40490    | AirTel          | 47002    | BGD AKTEL                     | 40434    | CellOne                        |
| 40492    | AirTel          | 47004    | BGD bMobile                   | 40438    | CellOne                        |
| 40493    | AirTel          | 47001    | BGD-GP                        | 40451    | CellOne                        |
| 40494    | AirTel          | 21890    | BH GSMBIH                     | 40453    | CellOne                        |
| 40495    | AirTel          | 43701    | BITEL KGZ                     | 40454    | CellOne                        |
| 40496    | AirTel          | 61603    | BJ BENINCELL                  | 40455    | CellOne                        |
| 40497    | AirTel          | 73602    | BOMOV                         | 40457    | CellOne                        |
| 40498    | AirTel          | 34020    | BOUYGTel-C                    | 40458    | CellOne                        |
| 41501    | alfa            | 40421    | BPL MOBILE                    | 40459    | CellOne                        |
| 60301    | ALG Mobilis     | 40427    | BPL MOBILE                    | 40462    | CellOne                        |
| 42001    | ALJAWAL         | 40443    | BPL MOBILE                    |          |                                |

| Kennzahl | Netzbetreiber                  | Kennzahl | Netzbetreiber        | Kennzahl | Netzbetreiber        |
|----------|--------------------------------|----------|----------------------|----------|----------------------|
| 40464    | CellOne                        | 35250    | Digicel              | 20201    | GR COSMOTÉ           |
| 40466    | CellOne                        | 35850    | DIGICEL              | 20209    | GR Q-TELECOM         |
| 40471    | CellOne                        | 36070    | DIGICEL              | 73802    | GUY CLNK PLS         |
| 40472    | CellOne                        | 70602    | Digicel              | 73801    | GUY TW               |
| 40473    | CellOne                        | 310940   | Digital Cellular     | 21601    | H PANNON GSM         |
| 40474    | CellOne                        | 73402    | DIGITEL TIM          | 311110   | High Plains          |
| 40475    | CellOne                        | 63801    | DJ EVATIS            | 31070    | Highland             |
| 40476    | CellOne                        | 60302    | Djezzy               | 45400    | HK CSL               |
| 40477    | CellOne                        | 23802    | DK SONOFON           | 45402    | HK CSL               |
| 40479    | CellOne                        | 60303    | DZA-NEDJMA           | 45418    | HK CSL               |
| 40480    | CellOne                        | 21403    | E AMENA              | 45410    | HK NEW WORLD         |
| 40481    | CellOne                        | 31090    | Edge Wireless        | 45412    | HK PEOPLES           |
| 61701    | CELLPLUS-MRU                   | 24802    | EE elisa             | 45416    | HK SUNDAY            |
| 310560   | Cellular One DCS               | 24801    | EE EMT GSM           | 70830    | HND                  |
| 61402    | CELTEL                         | 60201    | EGY MobiNiL          | 74401    | HOLA PARAGUAY S.A.   |
| 62901    | CELTEL                         | 61710    | EMTEL-MRU            | 21910    | HR VIP               |
| 63903    | CELTEL                         | 311160   | EMW                  | 65401    | HURI                 |
| 64005    | celtel                         | 26203    | E-Plus               | 40401    | Hutch                |
| 63002    | CELTEL DRC                     | 26002    | Era                  | 40405    | Hutch                |
| 62803    | CELTEL GA                      | 70601    | ESV PERSONAL         | 40411    | Hutch                |
| 65010    | CELTEL MW                      | 63601    | ETH-MTN              | 40413    | Hutch                |
| 61901    | CELTEL SL                      | 42003    | Etihad Etisalat      | 40415    | Hutch                |
| 62201    | CELTEL TCD                     | 45702    | ETL MOBILE NETWORK   | 40430    | Hutch                |
| 70802    | CELTEHND                       | 23002    | EUROTEL - CZ         | 40484    | Hutch                |
| 31030    | Centennial Communica-<br>tions | 20820    | F - BOUYGUES TELECOM | 40486    | Hutch                |
| 46000    | CHINA MOBILE                   | 20810    | F SFR                | 40488    | Hutch                |
| 46001    | CHN-CUGSM                      | 46601    | Far EasTone          | 40566    | Hutch                |
| 46692    | Chunghwa                       | 311210   | FARMERS              | 41308    | Hutch                |
| 310380   | Cingular                       | 41601    | Fastlink             | 45503    | Hutchison MAC        |
| 342810   | Cingular                       | 24414    | FI AMT               | 22201    | I TIM                |
| 344930   | Cingular                       | 24491    | FI SONERA            | 22288    | I WIND               |
| 35010    | Cingular                       | 302370   | Fido                 | 71201    | I.C.E.               |
| 35230    | Cingular                       | 24403    | FINNET               | 40404    | IDEA                 |
| 35830    | Cingular                       | 24412    | FINNET               | 40407    | IDEA                 |
| 36010    | Cingular                       | 54201    | FJ VODAFONE          | 40412    | IDEA                 |
| 36620    | Cingular                       | 24405    | FL elisa             | 40419    | IDEA                 |
| 54801    | CK KOKANET                     | 29505    | FL1                  | 40422    | IDEA                 |
| 73001    | CL ENTEL PCS                   | 34001    | F-Orange             | 40424    | IDEA                 |
| 73010    | CL ENTEL PCS                   | 34002    | FR                   | 40456    | IDEA                 |
| 72405    | Claro                          | 55001    | FSM Telecom          | 40478    | IDEA                 |
| 62910    | COG LIBERTIS                   | 54720    | F-VINI               | 26003    | IDEA, PL IDEA, PL 03 |
| 732101   | COLOMBIA - COMCEL<br>S.A       | 28801    | F oya Tele           | 61002    | IKATEL ML            |
| 70402    | Comcel_GSM                     | 62802    | GAB TELECEL          | 42502    | IL Cellcom           |
| 62501    | CPV MOVEL                      | 60701    | GAMCEL               | 42501    | IL ORANGE            |
| 72432    | CTBC CEL                       | 28201    | GEO-GEOCELL          | 42503    | IL Pelephone         |
| 72433    | CTBC CEL                       | 62002    | GH ONEtouch          | 22807    | In&Phone             |
| 72434    | CTBC CEL                       | 62001    | GH SPACEFON          | 40442    | INA AIRCEL           |
| 36801    | CU/C_COM                       | 62003    | GH-MOBITEL           | 40441    | INA RPG              |
| 28001    | CY CYTAGSM                     | 26601    | GIBTEL GSM           | 40414    | INA SPICE            |
| 25014    | Di-ex                          | 62150    | Glo NG               | 40444    | INA SPICE            |
| 50216    | DiGi                           | 51502    | Globe Telecom-PH     | 51011    | IND - Excelcom       |
| 33805    | DIGICEL                        | 61102    | GN LAGUI             | 40440    | IND AIRTEL           |
| 342750   | DIGICEL                        | 62701    | GNQ01                | 40551    | IND AirTel           |
|          |                                | 27821    | go mobile            | 40552    | IND AirTel           |

| Kennzahl | Netzbetreiber      | Kennzahl | Netzbetreiber   | Kennzahl | Netzbetreiber           |
|----------|--------------------|----------|-----------------|----------|-------------------------|
| 40553    | IND AirTel         | 64602    | MG ANTARIS      | 23205    | one                     |
| 40554    | IND AirTel         | 64601    | MG Madacom      | 23433    | Orange                  |
| 40555    | IND AirTel         | 61902    | MILLICOM SL     | 23830    | Orange                  |
| 51001    | IND INDOSAT        | 29402    | MKD COSMOFON    | 37001    | orange                  |
| 51021    | IND INDOSAT        | 29401    | MKD-MOBIMAK     | 40420    | Orange                  |
| 51010    | IND TELKOMSEL      | 41401    | MM 900          | 65202    | Orange                  |
| 40470    | INDH1              | 42899    | MN MobiCom      | 62402    | Orange CAM              |
| 31130    | Indigo             | 21805    | MOBI'S          | 22803    | orange CH               |
| 43602    | Indigo-T           | 29341    | MOBITEL         | 61203    | Orange CI               |
| 310770   | Iowa Wireless USA  | 41301    | Mobitel         | 20801    | Orange F                |
| 43214    | IR KISH            | 45601    | MOBITEL - KHM   | 29502    | Orange FL               |
| 43219    | IR MTCE            | 64002    | MOBITEL - TZ    | 20420    | Orange NL               |
| 43232    | IR, VALIACOM       | 63401    | MobiTel SDN     | 64700    | Orange re               |
| 41830    | IRAQNA             | 22004    | MONET           | 23101    | Orange SK               |
| 27203    | IRL - METEOR       | 60401    | MOR IAM         | 52099    | Orange Th               |
| 43211    | IR-TCI             | 60400    | MOR MEDITEL     | 25011    | ORENSOT                 |
| 27401    | IS SIMINN          | 21407    | movistar        | 23003    | OSKAR                   |
| 51501    | ISLACOM            | 70403    | MoviStar        | 26803    | P OPTIMUS               |
| 42505    | JAWWAL-PALESTINE   | 70604    | MoviStar        | 26806    | P TMN                   |
| 41677    | JO MobCom          | 64301    | MOZ - mCel      | 41004    | PAK - PL                |
| 44010    | JP DoCoMo          | 60901    | MR MATTEL       | 71401    | PANCW                   |
| 28802    | KALL               | 64901    | MTC NAMIBIA     | 70401    | PCS                     |
| 46688    | KGT-Online         | 42602    | MTC VODAFONE BH | 311170   | PetroCom                |
| 45602    | KHM-Hello GSM      | 28401    | M-TEL GSM BG    | 51505    | PH Sun Cellular         |
| 54509    | KL-Frigate         | 62130    | MTN - NG        | 31180    | Pine Cellular           |
| 45005    | KOR SK Telecom     | 62401    | MTN CAM         | 41001    | PK MK                   |
| 46703    | KP SUN             | 65510    | MTN-SA          | 41003    | PK-UFONE                |
| 45002    | KR KTF             | 64110    | MTN-UGANDA      | 26001    | Plus GSM                |
| 45008    | KR KTF             | 25702    | MTS BY          | 53701    | PNGBMobile              |
| 41902    | KT MTCNet          | 25001    | MTS-RUS         | 74001    | PORTA GSM               |
| 41903    | KT WATANIYA        | 47201    | MV DHIMOBILE    | 25092    | Primetelefone RUS       |
| 40102    | KZ KCELL           | 65001    | MW CP 900       | 22002    | ProMonte                |
| 40101    | KZ K-MOBILE        | 33403    | MX MOVISTAR GSM | 74402    | PRY Porthable           |
| 27001    | L LUXGSM           | 33420    | Mx Telcel GSM   | 310500   | PSC Wireless            |
| 27077    | L TANGO            | 50219    | MY CELCOM       | 74405    | PY Personal             |
| 27099    | L VOX.LU           | 50213    | MY CELCOM 3G    | 42701    | QAT QATARNET            |
| 61801    | LBR Lonestar Cell  | 50212    | MY MAXIS        | 28301    | RA-ARMGSM               |
| 29577    | LI TANGO           | 24202    | N NetCom GSM    | 63510    | R-CELL                  |
| 61802    | LIBERCELL          | 24201    | N Telenor       | 25012    | RF FAR EAST             |
| 60600    | LIBYANA            | 42203    | NAWRAS          | 41503    | RL MTC Lebanon          |
| 51008    | LIPPO TEL          | 54601    | NCL MOBILIS     | 22601    | RO CONNEX               |
| 65102    | LS-ECONET-EZI-CEL  | 61403    | NE TELECEL      | 22603    | RO Cosmorom             |
| 24602    | LT BITE GSM        | 62140    | NG Mtel         | 22610    | RO ORANGE               |
| 24701    | LV LMT GSM, LV LMT | 20408    | NL KPN          | 41220    | ROSHAN                  |
| 24702    | LV TELE2           | 20412    | NL Telfort      | 25007    | RUS 07, RUS SMARTS      |
| 45501    | MAC-CTMGSM         | 26207    | o2 - de         | 25017    | RUS 17                  |
| 28202    | MAGTI-GSM-GEO      | 26208    | o2 - de         | 25010    | RUS DTC                 |
| 61001    | MALITEL ML         | 23410    | O2 - UK         | 25013    | RUS Kuban-GSM           |
| 23458    | Manx Pronto        | 27402    | Og Vodafone     | 25044    | RUS North Caucasian GSM |
| 90112    | MCP Maritime Com   | 27403    | Og Vodafone     | 25019    | RUS_BASHCELL            |
| 25902    | MD MOLDCELL        | 72431    | Oi              | 25015    | RUS15, RUS SMARTS       |
| 25901    | MD VOXTEL          | 732111   | OLA             | 25016    | RUS16,250 16            |
| 25002    | MegaFon RUS        | 42202    | OMAN MOBILE     | 24007    | S COMVIQ                |
| 70801    | Megatel GSM        | 24601    | OMNITEL LT      | 42101    | SabaFon                 |



| Kennzahl | Netzbetreiber    | Kennzahl | Netzbetreiber   | Kennzahl | Netzbetreiber             |
|----------|------------------|----------|-----------------|----------|---------------------------|
| 63902    | Safaricom        | 64803    | TELECEL ZW      | 25503    | UA-KYIVSTAR               |
| 61401    | SAHELCOM         | 64282    | TELECEL-BDI     | 53901    | U-CALL                    |
| 41808    | SanaTel          | 61205    | TELECEL-CI      | 64101    | UG CelTel                 |
| 25005    | SCS RUS          | 73002    | TELEFONICA      | 25502    | UKR-WellCOM               |
| 71073    | SERCOM           | 310740   | TELEMETRIX      | 41603    | UMNIAH                    |
| 36301    | SETAR GSM        | 72423    | TELEMIG CEL     | 72207    | UNIFON                    |
| 63301    | SEYCEL           | 70603    | TELEMOVIL       | 63102    | UNITEL                    |
| 63310    | SEZ AIRTEL       | 41006    | Telenor PK      | 25039    | Uraltel                   |
| 64710    | SFR REUNION      | 23820    | TELIA DK        | 74810    | URYAMWU                   |
| 52503    | SGP-M1-3GSM      | 24001    | TELIA S         | 310870   | US                        |
| 29370    | SI VEGA 070      | 50501    | Telstra Mobile  | 31020    | US - Union Telephone      |
| 29340    | SI vodafone      | 310900   | Texas Cellular  | 310100   | US PLATEAU                |
| 25004    | SIBCHALLENGE RUS | 61501    | TG-TOGO CELL    | 310320   | USA - CellularOne         |
| 52501    | SingTel          | 52015    | TH ACT 1900     | 310590   | USA - Extended Area       |
| 52502    | SingTel-G18      | 52001    | TH GSM          | 310690   | USA - Immix Wireless      |
| 51503    | SMART            | 52023    | TH GSM 1800     | 31080    | USA 080                   |
| 45406    | SmarTone         | 52018    | TH-DTAC         | 310340   | USA 340                   |
| 45500    | SmarTone         | 71610    | TIM             | 310640   | USA AE Airadigm           |
| 45415    | SmarTone 3G      | 72402    | TIM BRASIL      | 310630   | USA AmeriLink             |
| 60801    | SN ALIZE         | 72403    | TIM BRASIL      | 310190   | USA Dutch Harbor          |
| 60802    | SN-SENTEL SG     | 72404    | TIM BRASIL      | 310400   | USA i CAN                 |
| 63704    | SOMAFONE         | 20210    | TIM GR          | 311250   | USA i CAN                 |
| 43601    | Somoncom         | 43603    | TJK MLT         | 31100    | USA Mid-Tex Cellular, Ltd |
| 63701    | SOMTELESOM       | 51402    | TLS-TT          | 310790   | USA Pinpoint              |
| 42102    | SPACETEL         | 31026    | T-Mobile        | 31046    | USA SIMMETRY              |
| 64201    | Spacetel BI      | 31031    | T-Mobile        | 310950   | USA XIT Cellular          |
| 30801    | SPM AMERIS       | 310160   | T-Mobile        | 310880   | USAACSI                   |
| 24010    | SpringMobil SE   | 310200   | T-Mobile        | 311190   | USAC1ECI                  |
| 74602    | SR.TELESUR.GSM   | 310210   | T-Mobile        | 31170    | USAEC                     |
| 41303    | SRI - CELLTEL    | 310220   | T-Mobile        | 310910   | USAFc                     |
| 41302    | SRI DIALOG       | 310230   | T-Mobile        | 31190    | USASXLP                   |
| 21303    | STA-MOBILAND     | 310240   | T-Mobile        | 31040    | USATX                     |
| 52505    | STARHUB          | 310250   | T-Mobile        | 310530   | USA-WVA WIRELESS          |
| 62601    | STP CSTmovel     | 310260   | T-Mobile        | 64111    | UTL-Mango                 |
| 45419    | SUNDAY           | 310270   | T-Mobile        | 43405    | UZB CSOCOM GSM            |
| 22802    | sunrise          | 310660   | T-Mobile        | 43404    | UZB DAEWOO-GSM            |
| 65310    | Swazi-MTN        | 23203    | T-Mobile A      | 43407    | UZB-UZD                   |
| 24004    | SWEDEN           | 23001    | T-Mobile CZ     | 27404    | Viking                    |
| 24005    | Sweden 3G        | 26201    | T-Mobile D      | 73601    | VIVA                      |
| 22801    | Swisscom         | 21630    | T-Mobile H      | 45201    | VN MOBIFONE               |
| 29501    | SwisscomFL       | 21901    | T-Mobile HR     | 45202    | VN VINAPHONE              |
| 41709    | SYR MOBILE SYR   | 20416    | T-Mobile NL     | 45204    | VNM and VIETTEL           |
| 41701    | SYRIATEL         | 23102    | T-Mobile SK     | 64004    | VodaCom                   |
| 46689    | T3G              | 28602    | TR TELSIM       | 63001    | VODACOM CD                |
| 45708    | TANGO LAO        | 28601    | TR TURKCELL     | 65101    | Vodacom Lesotho           |
| 23801    | TDC MOBIL        | 37412    | TSTT            | 64304    | VodaCom-MZ                |
| 36251    | Telcell GSM      | 60503    | TUNISIANA       | 65501    | VodaCom-SA                |
| 29001    | TELE Greenland   | 60502    | TUNISIE TELECOM | 27602    | vodafone AL               |
| 24603    | TELE2            | 46697    | TWN GSM 1800    | 50503    | vodafone AU               |
| 24803    | TELE2            | 46693    | TWN MOBITAI     | 60202    | vodafone EG               |
| 25020    | TELE2            | 25506    | UA life:)       | 21401    | vodafone ES               |
| 61602    | TELECEL BENIN    | 25501    | UA UMC          | 20205    | vodafone GR               |
| 74404    | Telecel GSM      | 42402    | UAE ETISALAT    | 21670    | vodafone HU               |
| 64502    | TELECEL ZM       | 25505    | UA-GT           |          |                           |

| <b>Kennzahl</b> | <b>Netzbetreiber</b> | <b>Kennzahl</b> | <b>Netzbetreiber</b> | <b>Kennzahl</b> | <b>Netzbetreiber</b> |
|-----------------|----------------------|-----------------|----------------------|-----------------|----------------------|
| 27201           | vodafone IE          | 23415           | vodafone UK          | 50502           | YES OPTUS            |
| 22210           | vodafone IT          | 26202           | Vodafone.de          | 22001           | YU MOBTEL            |
| 44020           | Vodafone JP          | 54101           | VUT SMILE            | 22003           | YUG 03               |
| 27801           | vodafone MT          | 73401           | VZ INFO              | 64003           | ZANTEL-TZ            |
| 20404           | vodafone NL          | 41007           | WaridTel             | 64501           | ZM CELTEL            |
| 53001           | vodafone NZ          | 23450           | wave                 | 64804           | ZW ECONET            |
| 26801           | vodafone P           | 31101           | Wilkes USA           | 64801           | ZW NET*ONE           |
| 24008           | vodafone SE          | 31105           | Wilkes USA           |                 |                      |

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