LinTech
keeps you connected

- AT Command List -

01.09.10

-Instructions-

1. AT Command List

The Bluetooth*RS232 industrial adapter can be set up and configured either via an existing Bluetooth connection or using the UART interface. It is also possible in this way to read out certain information such as the firmware version installed.

In order to simplify the configuration process, LinTech has created Bluetool, an easy to use Windows programme. The instructions for using this software are contained in the document entitled: **Bluetool Configuration Software – Operating Manual.**

For system environments in which the use of this Windows programme for configuration purposes is either impractical or undesirable, AT commands can alternatively be used to set the connection parameters.

The Bluetooth*RS232 industrial adapter can be operated with the aid of AT commands, either via an existing Bluetooth connection (using a terminal programme) or directly via the UART interface.
A list of AT commands is contained in this document.

NOTE
The AT command list contains all the AT commands. Some of these may only be supported by LinTech Bluetooth industrial adapters (see our article 1408...).
The AT commands which are supported in your case can be ascertained by reading out the information from device .
To do this enter the command: <ATI2> .

General command syntax:

Commands which are intended to be passed on to the command interpreter must be followed by <CR> (carriage return).
Example:
AT+RSTA<CR>

Commands sent *from* a device have the following format:
Example:
<CR> <LF>KOMMANDO<CR><LF> (LF = Line feed)

Commands sent *to* a device must be as follows:
<CR> <LF>OK<CR><LF>   this means: Command was performed successfully.
<CR> <LF>ERROR<CR><LF>   this means: Performance of command failed.

1.1 Read out firmware version (ATI1)

1.1.1 Description:
Command used for identifying firmware version.

1.1.2 Syntax:

Command syntax: ATI<n>

Command	Response
ATI1	Firmware version

1.1.3 Defined values
<n>
1: Firmware version is read out

1.2 Display available commands (ATI2)

1.2.1 Description:

Command used to ascertain supported commands.

1.2.2 Syntax:

Command syntax: ATI<n>

Command	Response
ATI2	List and description of commands

1.2.3 Defined values
<n>
2: Supported commands are read out

1.3 Alternate beween standard and user-friendly responses (AT+RATS / AT+UATS)

1.3.1 Description:
When set for user-friendly responses, the settings information is displayed as a description; otherwise standard AT commands are outputted.

Note: When set for user-friendly responses, all reading commands result in a description; no OK is transmitted
All writing commands lead to the corresponding reading command being performed in acknowledgement; no OK is transmitted.

1.3.2 Syntax:
Command syntax: AT+RATS   - Reading command
                                 AT+UATS=<n>   - Writing command

Command	Response
AT+RATS	+RATS: 1 OK *User-friendly responses*
AT+UATS=0 *Switch to user-friendly responses*	Response given as user-friendly text
AT+UATS=1 *Switch to standard responses*	Response given as user-friendly text OK

1.3.3 Defined values
<n>
0: User-friendly responses
1: Standard responses

1.4 Switch connection indicator on and off (AT+RSTA / AT+USTA)

1.4.1 Description:

When the connection indicator is switched on, the device supplies an indication of the connection status, without this being specifically requested, whenver the connection status is changed (+RSTA: <mode>,<state>).

1.4.2 Syntax:

Command syntax: AT+RSTA   - Reading command
                    AT+USTA=<mode>   - Writing command

Command	Response
AT+RSTA	+RSTA: <mode>,<state>
	+RSTA: 0,0
	OK
AT+USTA=1 *Switch on indicator*	OK

1.4.3 Defined values

<mode>
0: Switch off indicator
1: Switch on indicator

<state>
0: Idle
1: Attempt to set up a connection as Master
2: Attempt to set up a connection as Slave (Configuration mode)
3: Attempt to set up a connection as Slave (Transparent mode)
4: Device search
5: Connected
6: Connection failed – Bluetooth profile is not supported (Master)
7: Connection failed – Connection refused (Master)
8: Connection failed – Device out of range (Master)

1.5 Switch command interpreters on and off in Master mode (AT+RCON / AT+MCON)

1.5.1 Description:
Switches the AT command interpreter on or off in Master mode.

1.5.2 Syntax:

Command syntax: AT+RCON   - Reading command
                     AT+MCON=<mode>   - Writing command

Command	Response
AT+RCON	+RCON: 0 OK *Standard value: Master console switched off*
AT+MCON=0 *Switch off Master console*	OK
AT+MCON=1 *Switch on Master console*	OK

1.5.3 Defined values
<mode>
0: Switch off Master console
1: Switch on Master console

1.6 Read out all settings (AT+RALL)

1.6.1 Description:
All device settings are read out.

1.6.2 Syntax:

Command syntax: AT+RALL   - Reading command

Command	Response
AT+RALL	All settings read out

1.7 Restore all settings (AT+REST)

1.7.1 Description:

All settings revert to standard values and the device restarts.

1.7.2 Syntax:

Command syntax: AT+REST   - Writing command

Command	Response
AT+REST	OK

1.8 Determine security level for connection (AT+RBTS / AT+UBTS)

1.8.1 Description:

The Bluetooth security level can be switched on or off. When security is switched on, an authentication is requested and the data is transmitted in encrypted form.

1.8.2 Syntax:

Command syntax: AT+RBTS   - Reading command
                              AT+UBTS=<mode>   - Writing command

Command	Response
AT+RBTS	+RBTS: 1 OK *Standard value: Bluetooth security switched on*
AT+UBTS=0 *Switch off Bluetooth security*	OK

1.8.3 Defined values

<mode>
0: Bluetooth Sicherheit switched off
1: Bluetooth Sicherheit switched on

1.9 Read out/set Bluetooth PIN (Slave) (AT+RPIN / AT+CPIN)

1.9.1 Description:

Reads out and changes the Bluetooth PIN for the Slave connection mode

1.9.2 Syntax:

Command syntax: AT+RPIN   - Reading command
                                 AT+CPIN=<pin>   - Writing command

Command	Response
AT+RPIN	+RPIN: "1234" OK *Standard value: Bluetooth Slave PIN*
AT+CPIN=0123456789abcdef *Change PIN with maximum length*	OK

1.9.3 Defined values

<mode>
PIN with maximum length of 16 characters

1.10 Read out/set Bluetooth PIN (Master) (AT+RPMA / AT+CPMA)

1.10.1 Description:

Reads out and changes the Bluetooth PIN for the Master connection mode

1.10.2 Syntax:

Command syntax: AT+RPMA   - Reading command
                                 AT+CPMA=<pin>   - Writing command

Command	Response
AT+RPMA	+RPIN: "1234" OK *Standard value: Bluetooth Master PIN*
AT+CPMA=0123456789abcdef *Change PIN with maximum length*	OK

1.10.3 Defined values

<mode>
PIN with maximum length of 16 characters

1.11 Read out/change local device name (AT+RLBN / AT+CLBN)

1.11.1 Description:
Reads out and changes local Bluetooth device name.

1.11.2 Syntax:
Command syntax: AT+RLBN   - Reading command
                           AT+CLBN=<name>   - Writing command

Command	Response
AT+RLBN	+RLBN: "MyBluetoothName" OK *Device name*
AT+CLBN=My New Bluetooth Name *Change device name*	OK

1.11.3 Defined values
<name>
Device names, maximum length of 31 characters (ASCII character set)

1.12 Read out/change local Bluetooth device class (AT+RCOD / AT+CCOD)

1.12.1 Description:
Reads out and changes local Bluetooth device class.

1.12.2 Syntax:
Command syntax: AT+RCOD   - Reading command
                           AT+CCOD=<ufclass>   - Writing command or
                           AT+CCOD=<btclass>   - Writing command

Command	Response
AT+RCOD	+RCOD: 100,"Unclassified computer" OK *Standard device class*
AT+CCOD=? *Display available device classes*	User-friendly list of available classes

AT+CCOD=0A	OK
*Device class selected from user-friendly list – '*Desktop workstation'	
AT+CCOD=0104	OK
Device class changed in accordance with Bluetooth 'Assigned Numbers' – ' Desktop workstation'	

1.12.3 Defined values

< ufclass >
00 : Unclassified peripheral
01 : Keyboard
02 : Pointing device
03 : Combo keyboard/ pointing device
04 : Joystick
05 : Gamepad
06 : Remote control
07 : Sensing device
08 : Digitizer tablet
09 : Unclassified computer
0a : Desktop workstation
0b : Server computer
0c : Laptop computer
0d : Handheld PC/ PDA
0e : Palm sized
0f : Wearable computer (Watch sized)
10 : Uncategorized audio
11 : Headset
12 : Hands free
13 : Microphone
14 : Loudspeaker
15 : Headphones
16 : Portable audio
17 : Car audio
18 : Set top box
19 : Hifi audio device
1a : VCR
1b : Video camera
1c : Camcorder
1d : Video monitor
1e : Display and Speaker
1f : Video conferencing
20 : Gaming toy
21 : Uncategorized imaging
22 : Display
23 :Camera
24 : Scanner
25 : Printer
26 : Multifunctional device
27 : Uncategorized phone
28 : Cellular phone

29 : Cordless phone
2a : Smart phone
2b : Wired modem/ voice gateway
2c : Common ISDN Access
2d : Sim Card Reader

< btclass >
See: Bluetooth Assigned Numbers – Bluetooth Baseband

1.13 Select/change UART settings (AT+RUST / AT+UART)

1.13.1 Description:

Changes UART settings. The settings are only effective in Master and Slave – Transparent modes.
In the Slave – Configuration connectino mode, settings are not changed and are permanently set as follows – Baud rate: 115200; Stop bit: 1; Parity: none.

1.13.2 Syntax:

Command syntax: AT+RUST   - Reading command
                         AT+UART=<baudrate><stopbit><parity>   - Writing command

Command	Response
AT+RUST	+RUST: 023 OK *Standard UART settings*
AT+UART=601 *Baud rate: 38400 Stop bit: 1 Parity: odd*	OK

1.13.3 Defined values

< baudrate >
0: default = 115200
1: 1200
2: 2400
3: 4800
4: 9600
5: 19200
6: 38400
7: 57600
8: 115200
9: 230400
b: user-defined (see AT+RUSB / AT+SUSB)

0: one
1: two
2: default = one

<parity>
0: none
1: odd
2: even
3 = default = none

1.14 Read out/change user-defined baud rate (AT+RUSB / AT+SUSB)

1.14.1 Description:
This command is used to set a non-standard baud rate, for example 30,000 bauds.

1.14.2 Syntax:
Command syntax: AT+RUSB   - Reading command
                              AT+SUSB=<baudrate_value>   - Writing command

Command	Response
AT+RUSB	+RUSB: 7A OK *Baud rate set to 30,000 bauds*
AT+SUSB=07A *Baud rate: 30,000*	OK

1.14.3 Defined values
<baudrate_value>
baudrate_value = Baudrate * 0,004096
baudrate_value = 30000 * 0,004096
baudrate_value ~122
baudrate_value = 0x7A

1.15 Read out local Bluetooth address (AT+RBDA)

1.15.1 Description:

Reads out address of local Bluetooth device.

1.15.2 Syntax:

Command syntax: AT+RBDA   - Reading command

Command	Response
AT+RBDA	+RBDA: "FE-F9-ED-00-03-16" OK *Local device address*

1.16 Read out/set remote Bluetooth address (AT+RRBT / AT+SRBT)

1.16.1 Description:

This command is used to set the Bluetooth address of a remote device, to which it is desired to set up a connection in Master mode. This command saves the remote device address.
The address always refers to the device currently coupled.

Note:
Do not use this command to poll devices in master mode. For this functionality use command
AT+CONN=<rem_addr>

1.16.2 Syntax:

Command syntax: AT+RRBT   - Reading command
                         AT+SRBT=<rem_addr>   - Writing command

Command	Response
AT+RRBT	+RRBT: "FE-F9-ED-00-03-16" OK *Local device address*
AT+SRBT=000C72C40778	OK

1.16.3 Defined values

<rem_addr>
Bluetooth device address: Length 12 characters – standing for 6-byte device address

1.17 Continue attempting to set up a connection (Master) (AT+RCMC / AT+SCMC)

1.17.1 Description:
Continuous attempts are made in Master mode to set up a connection to the Bluetooth address entered under 'Remote device'.

1.17.2 Syntax:
Command syntax: AT+RCMC   - Reading command
                                AT+SCMC=<conn_c>   - Writing command

Command	Response
AT+RCMC	+RCMC: 0 OK *Standard continuous attempt to set up a connection switched off*
AT+SCMC=1 *Continuous attempt to set up a connection switched on*	OK

1.17.3 Defined values
<conn_c>
0: Continuous attempt to set up a connection switched off
1: Continuous attempt to set up a connection switched on

1.18 Attempt to set up a connection upon startup (Master) (AT+RCMS / AT+SCMS)

1.18.1 Description:
Device attempts to set up a connection to the Bluetooth address entered under 'Remote device' upon startup.

1.18.2 Syntax:
Command syntax: AT+RCMS   - Reading command
                                AT+SCMS=<conn_s>   - Writing command

Command	Response
AT+RCMS	+RCMS: 1 OK *Device attempts to set up connection*
AT+SCMS=0 *Device does not attempt to set up connection*	OK

1.18.3 Defined values
<conn_s>
0: Device does not attempt to set up connection
1: Device attempts to set up connection

1.19 Use DSR / DTR to create/end connection (AT+RMCC / AT+SMCC)

1.19.1 Description:

DSR- or DTR-signal can be used to create and afterwards disconnet a connection.
> (*ref. LinTech part.# 1409: BT RS232 Mini Adapter is available with D-SUB9 plug or socket /male or female/ connector.*
> *"Male" D-SUB9 – please use DSR for fulfil above mentioned function.*
> *"Female" D-SUB9 – please use DTR for fulfil above mentioned function.*)

In Slave mode, it is only possible to disconnect an existing connection

1.19.2 Syntax:

Command syntax: AT+RMCC   - Reading command
                                   AT+SMCC=<conn_mc>   - Writing command

Command	Response
AT+ RMCC	+ RMCC: 0 OK *Standard: DSR / DTR not used*
AT+ SMCC =1 *DSR / DTR used to control connections*	OK

1.19.3 Defined values

<conn_mc>
0: DSR / DTR not used to control connections
1: DSR / DTR used to control connections

Note:
The device initiates a connection on a rising edge of DSR (male)/ DTR (female).
The device disconnects a connection on a falling edge of DSR (male)/ DTR (female).

When the device is connected DTR (male) / DSR (female) is on.
When the device is not connected DTR (male) / DSR (female) is off.

1.20 Select COM-HARDWARE service class (Slave) (AT+RSEV / AT+SSEV)

1.20.1 Description:

Service can be selected between Serial Port Profile (SPP) and Dialup Networking (DUN).

1.20.2 Syntax:

Command syntax: AT+RSEV   - Reading command
                    AT+SSEV=<conn_mc>   - Writing command

Command	Response
AT+RSEV	+ RSEV: 0 OK *Standard: SPP*
AT+SSEV=1 *DUN service class used*	OK

1.20.3 Defined values

<conn_mc>
0: Bluetooth SPP service class
1: Bluetooth DUN service class

1.21 Change page scan interval (Slave) (AT+RPSC / AT+SPSC)

1.21.1 Description:

The page scan interval can be changed with respect to power consumption and response time of the device. The command only has an effect on the Slave Transparent mode.

1.21.2 Syntax:

Command syntax: AT+RPSC   - Reading command
                    AT+SPSC=<page_iv>   - Writing command

Command	Response
AT+RPSC	+ RPSC: 2 OK *Standard: Normal*
AT+SPSC=?	Available settings are displayed
AT+SPSC=3 *Quickest response time/greatest powe consumption*	OK

1.21.3 Defined values

1: Slowest response time / lowest power consumption
2: Normal response time / normal power consumption
3: Fastest response time / highest power consumption

1.22 Change/switch off inquiry scan interval (Slave) (AT+RISC / AT+SISC)

1.22.1 Description:

The inquiry scan interval can be changed or deactivated with respect to the power consumption and response time of the device. The command only has an effect on the Slave Transparent mode.

1.22.2 Syntax:

Command syntax: AT+ RISC   - Reading command
                   AT+SISC =< inqu_iv >   - Writing command

Command	Response
AT+RISC	+ RISC: 2 OK *Standard: Normal*
AT+SISC=?	Available settings are displayed
AT+SISC=0 *Deactivate Inquiry Scan*	OK

1.22.3 Defined values

<inqu_iv>
0: Inquiry Scan deactivated
1: Slowest response time / lowest power consumption
2: Normal response time / normal power consumption
3: Fastest response time / highest power consumption

1.23 Switch Sniff on/off (AT+RLPW / AT+ULPW)

1.23.1 Description:

The 'Sniff' energy-saving mode can be used in an existing connection if the remote device also supports the Sniff energy-saving mode.

1.23.2 Syntax:

Command syntax: AT+RLPW   - Reading command
                    AT+ULPW =<sniff>   - Writing command

Command	Response
AT+RLPW	+RLPW: 0 OK *Standard: Sniff deactivated*
AT+ULPW=1 *Sniff activated*	OK

1.23.3 Defined values

<sniff>
0: Sniff is not in use
1: Sniff is in use

1.24 Set Sniff idle time (AT+RSNI / AT+SSNI)

1.24.1 Description:

The Sniff energy-saving mode must be activated (AT+ULPW) .
The command sets the interval following which the device switches to Sniff mode, if no more data is being transmitted. As soon as data is transmitted again, the device reactivates itself automatically.

Note: If the interval is set to zero, the device does not change between active and Sniff modes.

1.24.2 Syntax:

Command syntax: AT+RSNI - Reading command
AT+SSNI =<sniff_time> - Writing command

Command	Response
AT+RSNI	+RSNI: 5 OK *Standard: 5 seconds*
AT+SSNI=07 *Sniff 7 seconds when idle*	OK
AT+SSNI=E6 *Sniff 230 seconds when idle*	OK

1.24.3 Defined values

< sniff_time >
0x00: Sniff idle time off
Otherwise:
Value between 0x05 – 0xFF in seconds

1.25 Switch LED on/off (AT+RLED / AT+SLED)

1.25.1 Description:

The status LED can be activated and deactivated.

1.25.2 Syntax:

Command syntax: AT+RLED - Reading command
AT+SLED=<led> - Writing command

Command	Response
AT+RLED	+RLED: 1 OK *Standard: Status LED is in use*
AT+SLED=0 *Status LED is not in use*	OK

1.25.3 Defined values

<led>
0: Status LED is not in use
1: Status LED is in use

1.26 Read out battery voltage – display charge status as a percentage (AT+RBAV)

1.26.1 Description:

Enables battery voltage or charge status (in per cent) to be read out

1.26.2 Syntax:

Command syntax: AT+RBAV   - Reading command

Command	Response
AT+RBAV	+RBAV: 3900,79 OK *Battery voltage 3900 mV, charge status 79%*

1.27 Switch hardware handshake on / off (AT+RSWH / AT+FSWH)

1.27.1 Description:

The usage of hardware handshake can be configured.

1.27.2 Syntax:

Command syntax: AT+RSWH   - Reading command
                             AT+FSWH=<use>   - Writing command

Command	Response
AT+ RSWH	+RSWH: 0 OK *Hardware handshake is enabled*
AT+ FSWH =1 *Hardware handshake is disabled*	OK

1.27.3 Defined values

<use>
0: Hardware handshake enabled
1: Hardware handshake disabled

1.28 Configure RS232-driver circuit to automatic / force on (AT+RRSI / AT+FRSI)

1.28.1 Description:

The RS232 – driver circuit can operate in a automatic mode. In automatic operation mode the driver circuit valuates the interface signals. When these signals are valid the device powers on.

In operation mode „forced on" the RS232 – circuit drives the serial interface.

*Note***:**
In operation mode „forced on" the power consumption of the device is higher .

1.28.2 Syntax:

Command syntax: AT+RRSI   - Reading command
                 AT+FRSI=<rs232>   - Writing command

Command	Response
AT+ RRSI	+RRSI: 0 OK *RS232 – circuit „automatic"*
AT+ FRSI =1 *RS232 – circuit „forced on"*	OK

1.28.3 Defined values

< rs232>
0: RS232-circuit „automatic"
1: RS232-circuit „forced on"

1.29 UART Optimization Settings (AT+ROPT / AT+SOPT)

(- from Version 5.01 -)

1.29.1 Description:

Set Connection for optimum Throughput or optimum Latency

1.29.2 Syntax:

Command syntax: AT+ROPT   - Reading command
                      AT+SOPT=<opt>   - Writing command

Command	Response
AT+ ROPT	+ROPT: 0 OK *Optimized for Latency*
AT+ SOPT=1 *Optimized for Throughput*	OK

1.29.3 Defined values

<opt>
0: Optimized for Throughput   (default)
1: Optimized for Latency

2. AT- Commands im Master mode

The following AT commands are only available in Master mode with the AT command interpreter switched on.

2.1 Initiate device search (AT+INQU)

2.1.1 Description:
A Bluetooth device search is initiated. The timeout can be changed using (AT+SINT).
Note: The device must be idle.

2.1.2 Syntax:
Command syntax: AT+INQU   - Executable command

Response Syntax:

+INQU: <state>[,<number>,<bt_addr>,<cod_num>,<cod_name>,<dev_name>]

Command	Response
AT+INQU	OK +INQU: 1 *Start Device search* +INQU: 1,0,"00-02-C7-12-66-6D",100,"Unclassified computer","CHARLIE" +INQU: 1,1,"00-02-EE-02-78-C4",204,"Cellular phone","Nokia 6310" +INQU: 1,2,"00-50-CD-15-02-92",108,"Server computer","CHARLIE2" +INQU: 0 *Device search ended*

2.1.3 Defined values
<state>
1: Device search executed
0: Device search ended

<number>
Number of the device found

<bt_addr>
Bluetooth device address of device found

<cod_num>
Bluetooth device class of device found (siehe: Bluetooth assigned numbers)

<cod_name>
User-friendly device class name

<dev_name>
Bluetooth device nameof device found

2.2 Set/read out timeout for device search (AT+RINT / AT+SINT)

2.2.1 Description:
Set/read out timeout for the Bluetooth device search.

2.2.2 Syntax:
Command syntax: AT+RINT   - Reading command
                     AT+SINT =<timeout>   - Writing command

Command	Response
AT+RINT	+RINT: A OK *Timeout = 0x0A = 10 seconds*
AT+SINT=05 *Timeout 5 seconds*	OK
AT+SINT=BD *Timeout 189 seconds*	OK

2.2.3 Defined values
<timeout>
05-FF
Timeout can be set in the range 5-255 seconds.

2.3 Attempt to set up a connection (Master) (AT+CONN)

2.3.1 Description:
This command is used to set up a connection as Master. The following types of use are possible:
- The command can be used to create a connection to a device in the device search list (AT+INQU) by entering the number of the device found <number>. This must be preceded by a device search.

- The command can be used to create a connection to the device with which the last connection existed.

- The command can be used to create a connection to a particular device address.

Note: The device must be idle in order to perform this command.

2.3.2 Syntax:
Command syntax: AT+CONN[=<number>]   - Executable command
                                AT+CONN[=<rem_addr >]   - Executable command

Command	Response
AT+CONN - *Attempt made to set up a connection with previously connected device*	OK
AT+ CONN=0002C712666D - *Attempt to set up a connection to device address 00-02-C7-12-66-6D*	OK
AT+CONN=0 - *Attempt to set up a connection to number 0 in the device search list ((AT+INQU) previously executed)*	OK
AT+CONN=3 - *Attempt to set up a connection to number 3 in the device search list ((AT+INQU) previously executed)*	OK

2.3.3 Defined values
<number>
Number of the device found from Bluetooth device search (AT+INQU)

<rem_addr>
Bluetooth device address: Length 12 characters – standing for 6-byte device address