TD1202 RM

TD1202 REFERENCE MANUAL

1 Overview

Thank you for choosing the TD1202 SIGFOX™ gateway module from Telecom Design!

This document provides a reference manual for the Telecom Design TD1202 module.

As an overview, this chapter gives the scope of this document. The document's organization is then detailed, followed by a list of relevant documents.

1.1 Scope

The TD1202 module provides an integrated dual AT/SIGFOX™ command interpreter for interfacing with an external application over a serial link.

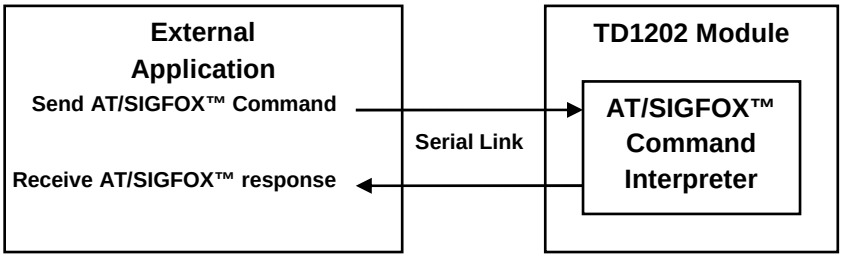

Figure 1- AT/SIGFOX™ Command Interpreter

This guide focuses on the description of the commands and responses provided by the TD1202 module used in the communication with the external application.

1.2 Organization

Each section in this document covers a separate topic, organized as follow:

- Section 1 is this overview
- Section 2 is a Hayes-compatible AT command set reference
- Section 3 provides a SIGFOX™-compatible command set reference

1.3 Relevant Documents

This document provides a reference manual for the TD1202 SIGFOX™ Gateway module. Additional information on this module and on its dedicated evaluation board can be found in:

- *TD1202 Datasheet*
- *TD1202 EVB User's Guide*

The following standards are also referenced:

- *ITU-T Rec. T.50 (09/92) International Reference Alphabet (IRA)*
- *ISO/IEC 646:1991, Information technology — ISO 7-bit coded character set for information interchange*

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2 TD1202 Hayes-Compatible AT Command Set Reference

This section provides a reference for the Hayes-compatible “AT” commands implemented by the TD1202 Module.

2.1 TD1202 Factory Settings

A serial link handler is set with the following default values (factory settings):

- LVTTL electrical level
- Speed 9600 bps
- 8 data bits
- 1 stop bit
- No parity
- No hardware/software flow control

The following AT command interpreter settings are set up as factory defaults:

- Character echo is activated (“**ATE1**”)
- Format control is set to verbose (“**ATV1**”)
- Result codes are activated (“**ATQ0**”)
- Extended result codes are activated (“**ATX1**”)

2.2 AT Commands Presentation Rules

The AT commands are presented in the present documentation as follows:

- A ‘Description’ section provides general information on the AT command (or response) behavior
- A ‘Syntax’ section describes the command and response syntaxes and all parameters description
- A ‘Parameters and Defined Storage’ section describes all parameters and values
- A ‘Parameter Storage’ presents the command used to store the parameter value and/or the command to restore the parameter value
- An ‘Examples’ section presents the real use of the described command
- A ‘Notes’ section can also be included indicating some remarks about the command use

Figures are provided where necessary.

The commands will be listed alphabetically.

2.3 Information Responses and Result Codes

If format control is set to verbose (“**ATV1**”) and result codes are activated (“**ATQ0**”), the TD1202 module returns the “**<CR><LF>^SYSSTART<CR><LF>**” string upon device reset.

If command syntax is incorrect or the command contains wrong parameters, or the command cannot be executed successfully, the "**ERROR**" string is returned if format control is set to verbose ("**ATV1**"), or a "**4**" string is returned otherwise.

If the command line has been executed successfully, an "**OK**" string is returned if format control is set to verbose ("**ATV1**"), or a "**0**" string is returned otherwise.

2.4 AT Command Syntax Format

Command lines always start with "**AT**" and finish with a "**<CR>**" character, except for the "**A/**" command, and contain one or more commands.

Responses start and end with "**<CR><LF>**", except for the "**ATV0**" TD1202 module response format and the "**ATQ1**" (result code suppression) commands.

In the following examples "**<CR>**" and "**<CR><LF>**" characters are intentionally omitted.

2.4.1 Basic AT Command Syntax Format

The syntax of basic commands is:

```
<command>[<number>]
```

Where "**<command>**" is either a single character, a "**?**" character (IA5 3/15), or the "**&**" character (IA5 2/6) followed by a single character. Characters used in "**<command>**" shall be taken from the set of alphabetic characters.

"**<number>**" may be a string of one or more characters from "**0**" through "**9**" representing a decimal integer value. Commands that expect a "**<number>**" are noted in the description of the command. If a command expects "**<number>**" and it is missing ("**<command>**" is immediately followed in the command line by another "**<command>**" or the termination character), the value "**0**" is assumed. If a command does not expect a "**<number>**" and a number is present, an "**ERROR**" is generated. All leading "**0**"s in "**<number>**" are ignored by the TD1202 AT command interpreter.

2.4.2 S-parameters

Commands that begin with the letter "**S**" constitute a special group of parameters known as "S-parameters". These differ from other commands in important respects.

The number following the "**S**" indicates the "parameter number" being referenced. If the number is not recognized as a valid parameter number, an "**ERROR**" result code is issued.

Immediately following this number, either a "**?**" or "**=**" character (IA5 3/15 or 3/13, respectively) shall appear. "**?**" is used to read the current value of the indicated S-parameter; "**=**" is used to set the S-parameter to a new value.

```
S<parameter_number>?
S<parameter_number>=[<value>]
S<parameter_number>=?
```

If the "**?**" is used, the TD1202 module transmits a single line of information text to the external application. The ranges of returned values are given in the description of each S-parameter.

If the "**=**" is used, the new value to be stored in the S-parameter is specified in decimal following the "**=**". If no value is given (i.e., the end of the command line occurs or the next command follows immediately), the S-parameter specified may be set to 0, or an "**ERROR**" result code issued and the stored value left unchanged. The ranges of acceptable values are given in the description of each S-parameter.

If the "=**?**" is used, the TD1202 module transmits a single line of information text to the external application, giving the ranges of accepted values as given in the description of each S-parameter.

2.4.3 Extended AT Command Syntax Format

The syntax of extended commands is:

```
$<command>=[<value1>[,<value2>]…]
$<command>?
```

Where "**$**" is an ISO/IEC 646 (US) code 24 character, and "**<command>**" is made up of multiple characters taken from the set of alphabetic characters.

The first form is used as an "action" command. In this form, the "**<command>**" is followed by an "**=**" character (IA5 3/13) and zero or more "**<valuex>**", separated by "," characters (IA5 2/12). If no value is given (i.e., the end of the command line occurs or the next command follows immediately), the extended command parameter specified may be set to 0, or an "**ERROR**" result code issued and the stored value is left unchanged.

"**<valuex>**" may be a string of one or more alphanumeric characters from "**0**" through "**9**", "**a**" to "**z**" or "**A**" to "**Z**". The range of acceptable values is given in the description of each extended command.

The second form is used as a "read" command. In this form, the "**<command>**" is followed by an "**?**" character (IA5 3/15). In this form, the TD1202 AT command interpreter transmits a single line of information text to the external application. For extended commands defined in this specification, the text portion of this information consists of one or more alphanumeric characters from "**0**" through "**9**", "**a**" to "**z**" or "**A**" to "**Z**". The range of possible values is given in the description of each extended command.

2.4.4 AT Command Concatenation

Concatenation of multiple AT commands on the same line is not supported in the current firmware version.

2.5 Attention Command

2.5.1 Description

This command always returns OK.

2.5.2 Syntax

Action Command

AT
OK

Read Command

None

Test Command

None

2.5.3 Parameters and Defined Values

None

2.5.4 Parameter Storage

None

2.5.5 Examples

Command	Responses
AT	**OK**

2.6 Repeat Last Command A/

2.6.1 Description

This command repeats the last command of the open session. Only the A/ command itself cannot be repeated.

2.6.2 Syntax

Action Command
A/ *Note: the response depends on the previous command*

Read Command
None

Test Command
None

2.6.3 Parameters and Defined Values

None

2.6.4 Parameter Storage

None

2.6.5 Examples

Command	Responses
ATI	**Telecom Design TD1202** **OK**
A/ *Note: Repeat last command*	**Telecom Design TD1202** **OK**

2.6.6 Notes

Unlike all other AT commands, this command is executed immediately after the last "**/**" character is received, without waiting for a finish "**<CR>**" character.

2.7 Help ?

2.7.1 Description

This command displays a summary of the available AT commands.

Note: This command is a Telecom Design extension to the basic AT command set.

2.7.2 Syntax

Action Command **AT?** *Note: The response depends on the list of available commands*

Read Command None

Test Command None

2.7.3 Parameters and Defined Values

None

2.7.4 Parameter Storage

None

2.7.5 Examples

Command	Responses
AT? *Note: display a summary of available AT commands*	**<list of commands>** **OK** *Note: The response depends on the list of available commands*

2.8 Echo Activation E

2.8.1 Description

This command is used to determine whether the TD1202 module echoes characters received by an external application (DTE) or not.

2.8.2 Syntax

Action Command

ATE[<n>]
OK

Read Command

None

Test Command

None

2.8.3 Parameters and Defined Values

Parameter	Value	Description
<n>		**Echo Activation Parameter**
	0	Characters are not echoed
	1	Characters are echoed (default value)

2.8.4 Parameter Storage

The **<n>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.8.5 Examples

Command	Responses
ATE0 *Note: characters are not echoed*	**OK** *Note: Done*
ATE1 *Note: characters are echoed*	**OK** *Note: Done*

2.9 Information Display Control I

2.9.1 Description

This command causes the product to transmit one or more lines of specific information text.

2.9.2 Syntax

Action Command

ATI[<n>]
Depending on <n>
OK

Read Command

None

Test Command

None

2.9.3 Parameters and Defined Values

Parameter	Value	Description
<n>		**Information Display Control Parameter**
	0	Display manufacturer followed by model identification (default value). Always returns the string "**Telecom Design TD1202**".
	5	Display firmware release date. Returns a string "**Mmm+yyyy**", where "**mm**" is a 2-digit month number and "**yyyy**" is a 4-digit year.
	7	Display RF serial number (SIGFOX™ ID) as an 8-digit hexadecimal number.
	10	Display baseband unique ID as a 16-digit hexadecimal number.
	11	Display hardware revision number as a 2-digit hexadecimal number.
	13	Display firmware revision number as a string "**SOFTxxxx**" ,where "**xxxx**" is a 4-digit number.
	21	Display RF chip part number as a string.
	25	Display RF chip ROM ID as a decimal number: ■ 2: Revision 0B ■ 3: Revision 1B
	26	Display module temperature in °C as a decimal number.
	27	Display module idle power supply voltage as a decimal number with 2 decimal places separated by a dot character.
	28	Display module RF active power supply voltage as a decimal number with 2 decimal places separated by a dot character. Note: the value is acquired during every SIGFOX™ RF transmission. If no value is available, the "**0.00**" value is returned. This value is the recommended value to monitor a battery supply, as it provides the supply voltage with the maximum load.

2.9.4 Parameter Storage

None

2.9.5 Examples

Command	Responses
ATI0 *Note: Manufacturer and model identification*	**Telecom Design TD1202** **OK** *Note: Command valid*
ATI5 *Note: result firmware release date*	**M08+2012** **OK** *Note: August 2012*
ATI7 *Note: serial number (SIGFOX™ ID)*	**00001058** **OK** *Note: Serial number 1058*
ATI10 *Note: baseband unique ID*	**209531004F62DFF9** **OK** *Note: baseband unique ID 209531004F62DFF9*
ATI11 *Note: hardware revision number*	**0F** **OK** *Note: hardware 0F*
ATI13 *Note: firmware revision number*	**SOFT1100** **OK** *Note: firmware SOFT1100*
ATI21 *Note: RF chip part number*	**Si4461** **OK** *Note: RF chip is Si4461*
ATI25 *Note: RF chip revision number*	**2** **OK** *Note: RF chip revision is 0B*
ATI26 *Note: module temperature*	**21** **OK** *Note: module temperature is 21°C*
ATI27 *Note: module idle power supply voltage*	**3.25** **OK** *Note: module idle power supply voltage is 3.25 V*
ATI28 *Note: module RF active power supply voltage*	**3.22** **OK** *Note: module RF active power supply voltage is 3.22 V*

2.10 Result Code Suppression Q

2.10.1 Description

This command determines whether the TD1202 module sends result codes or not.

2.10.2 Syntax

Action Command

ATQ[<n>]
[OK]

Read Command

None

Test Command

None

2.10.3 Parameters and Defined Values

Parameter	Value	Description
<n>		**Result Code Suppression Parameter**
	0	The TD1202 module transmits result codes (default value)
	1	Result codes suppressed and not transmitted

2.10.4 Parameter Storage

The **<n>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.10.5 Examples

Command	Responses
ATQ0 *Note: the TD1202 transmits result codes*	**OK** *Note: Command valid*
ATQ1 *Note: result codes are suppressed and not transmitted*	 *Note: No response*

2.11 Restart Banner Display S200

2.11.1 Description

This command configures, queries or disables the restart banner display.

2.11.2 Syntax

Action Command

ATS200=[<display>]
OK

Read Command

ATS200?
<display>
OK

Test Command

ATS200=?
0..1
OK

2.11.3 Parameters and Defined Values

Parameter	Value	Description
<display>		**SIGFOX™ Keepalive Period Parameter**
	0	Disable restart banner display (default value)
	1	Disable restart banner display

2.11.4 Parameter Storage

The **<display>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.11.5 Examples

Command	Responses
ATS200?	**0** **OK** *Note: restart banner display is disabled*
ATS200=1 *Note: enable the restart banner display*	**OK** *Note: Command valid*
AT&W *Note: save parameter value in Flash memory*	**OK** *Note: Command valid*
ATZ *Note: restart the TD1202 module*	**OK** **^SYSSTART** *Note: Command valid and restart banner is displayed*

2.11.6 Notes

The restart banner is only displayed if this parameter is enabled ("**ATS200=1**"), format control verbosity is enabled ("**ATV1**") and result code suppression is disabled ("**ATQ0**") in Flash memory during restart.

2.12 SIGFOX™ Keepalive S300

2.12.1 Description

This command configures, queries or disables the SIGFOX™ keepalive RF messages period.

2.12.2 Syntax

Action Command

ATS300=[<period>]
OK

Read Command

ATS300?
<period>
OK

Test Command

ATS300=?
0..127
OK

2.12.3 Parameters and Defined Values

Parameter	Value	Description
<period>		**SIGFOX™ Keepalive Period Parameter**
	0	Disable SIGFOX™ keepalive RF messages
	1..127	Period between 2 SIGFOX™ keepalive RF messages in hours (default value is 24)

2.12.4 Parameter Storage

The **<period>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.12.5 Examples

Command	Responses
ATS300?	**24** **OK** *Note: SIGFOX™ keepalive messages are sent every 24 hours*
ATS300=48 *Note: enable the SIGFOX™ keepalive messages every 48 hours*	**OK** *Note: Command valid*
ATS300=0 *Note: disable the SIGFOX™ keepalive messages*	**OK** *Note: Command valid*

2.13 SIGFOX™ Keepalive S301

2.13.1 Description

This command configures, queries or disables the SIGFOX™ keepalive RF messages number of repeats.

2.13.2 Syntax

Action Command

ATS301=[<repeat>]
OK

Read Command

ATS301?
<repeat>
OK

Test Command

ATS301=?
0..2
OK

2.13.3 Parameters and Defined Values

Parameter	Value	Description
<repeat>		**SIGFOX™ Keepalive Repeat Parameter**
	0	Disable SIGFOX™ keepalive RF message retries
	1..2	Number of repeats of SIGFOX™ keepalive RF message (default value is 2)

2.13.4 Parameter Storage

The **<repeat>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.13.5 Examples

Command	Responses
ATS301?	**2** **OK** *Note: SIGFOX™ keepalive messages are with 2 repeats*
ATS301=1 *Note: enable the SIGFOX™ keepalive messages with 1 repeat*	**OK** *Note: Command valid*
ATS301=0 *Note: disable the SIGFOX™ keepalive message retries*	**OK** *Note: Command valid*

2.14 SIGFOX™ Power S302

2.14.1 Description

This command configures or queries the SIGFOX™ RF power level in dBm.

2.14.2 Syntax

Action Command

ATS302=[<dbm_level>]
OK

Read Command

ATS302?
<dbm_level>
OK

Test Command

ATS302=?
0..14
OK

2.14.3 Parameters and Defined Values

Parameter	Value	Description
<dbm_level>		**SIGFOX™ Power Parameter**
	0..14	SIGFOX™ RF power level in dBm (default value is 14)

2.14.4 Parameter Storage

The **<dbm_level>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.14.5 Examples

Command	Responses
ATS302?	**14** **OK** *Note: SIGFOX™ power is 14 dBm*
ATS302=10 *Note: set the SIGFOX™ RF power to 10 dBm*	**OK** *Note: Command valid*

2.15 SIGFOX™ RF Pin Configuration S303

2.15.1 Description

This command configures or queries the SIGFOX™ RF pin configuration.

2.15.2 Syntax

Action Command

ATS303 =[<config>]
OK

Read Command

ATS303?
<config>
OK

Test Command

ATS303=?
1..39
OK

2.15.3 Parameters and Defined Values

Parameter	Value	Description
<config>		**SIGFOX™ RF Pin Configuration Parameter**
	1..39	SIGFOX™ RF pin configuration (default value is 1)

2.15.4 Parameter Storage

The **<config>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.15.5 Examples

Command	Responses
ATS303?	**1** **OK** *Note: SIGFOX™ RF pin configuration is 1*
ATS303 =33 *Note: set the SIGFOX™ RF pin configuration to 33*	**OK** *Note: Command valid*

2.16 Format Control V

2.16.1 Description

This command determines whether the TD1202 module response format uses or not the header characters <CR><LF>, and whether the result codes are provided as numeric or verbose.

2.16.2 Syntax

Action Command

ATV<n>
OK

Read Command

None

Test Command

None

2.16.3 Parameters and Defined Values

Parameter	Value	Description
<n>		**Format Control Parameter**
	0	**Information Responses:** **<text><CR><LF>** — **Result Code:** **<numeric code><CR>**
	1 (default value)	(default value) **Information Responses:** **<CR><LF> <text><CR><LF>** — **Result Code:** **<CR><LF> <verbose code><CR><LF>**

2.16.4 Parameter Storage

The **<n>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.16.5 Examples

Command	Responses
ATV0 *Note: the TD1202 transmits limited headers and trailers and numeric result codes*	**0** *Note: Command is valid (0 means OK)*
ATV1 *Note: result the TD1202 transmits full headers and trailers and verbose response text*	**OK** *Note: Command valid*

2.17 Extended Result Code X

2.17.1 Description

This command determines whether the TD1202 module sends extended result codes or not.

Note: this command is only included for compatibility reason, as the TD1202 module does not feature any result code requiring an extension.

2.17.2 Syntax

Action Command

ATX[<n>]
OK

Read Command

None

Test Command

None

2.17.3 Parameters and Defined Values

Parameter	Value	Description
<n>		**Extended Result Code Parameter**
	0	The TD1202 module transmits normal result codes
	1	The TD1202 module transmits extended result codes (default value)

2.17.4 Parameter Storage

The **<n>** parameter value is stored in Flash memory using the **AT&W** command. The default value can be restored using the **AT&F** command.

2.17.5 Examples

Command	Responses
ATX0 *Note: the TD1202 transmits normal result codes*	**OK** *Note: Command valid*
ATX1 *Note: the TD1202 transmits extended result codes*	**OK** *Note: Command valid*

2.18 Default Configuration Z

2.18.1 Description

This command restores the configuration profile from non-volatile memory (Flash).

Note: As a Telecom Design extension, this command also resets the TD1202 module to its power-on state.

2.18.2 Syntax

Action Command

ATZ
OK

Read Command

None

Test Command

None

2.18.3 Parameters and Defined Values

None

2.18.4 Parameter Storage

None

2.18.5 Examples

Command	Responses
ATS302?	**14** **OK** *Note: Default value is in Flash memory*
ATS302=10 *Note: change transmission in volatile memory only*	**OK** *Note: Command valid*
ATZ	**OK** *Note: Command valid, will restart immediately*
ATS302?	**14** **OK** *Note: Default value set back from Flash memory*

2.19 Restore Factory Settings &F

2.19.1 Description

This command is used to restore factory settings from Flash memory.

2.19.2 Syntax

Action Command
AT&F OK

Read Command
None

Test Command
None

2.19.3 Parameters and Defined Values

None

2.19.4 Parameter Storage

None

2.19.5 Examples

Command	Responses
AT&F *Note: Asks for restoring the factory settings*	**OK** *Note: Done*

2.19.6 Notes

For each parameter, the section “Parameter Storage” specifies which default values can be restored using **AT&F**. The parameters are restored in RAM and in Flash memory, overwriting the profile set with **AT&W**.

2.20 Display Configuration &V

2.20.1 Description

This command is used to display the TD1202 module configuration.

2.20.2 Syntax

Action Command

AT&V

```
Telecom Design TD1202
Hardware Version: <hardware_revision>
Software Version: <firmware_revision>
S/N: <serial_number>
ACTIVE PROFILE
E<val1> V<va2> Q<val3> X<val4> S200:<val5> S300:<val6> S301:<val7> S302:<val8>
S303:<val9>
OK
```

Note: For each **<valx>** *parameter value, please refer to the corresponding command.*

Read Command

None

Test Command

None

2.20.3 Parameters and Defined Values

Parameter	Value	Description
<hardware_revision>		**Hardware Revision Number Parameter**
	2 ASCII hex digits	The TD1202 module hardware revision number
<firmware_revision>		**Firmware Revision Number Parameter**
	"**S0FTxxxx**"	The TD1202 module firmware revision number, with "**x**" being an ASCII-coded digit
<serial_number>		**Serial Number Parameter**
	8 ASCII hex digits	The TD1202 module serial number
<valx>		**Active Profile Parameters**
		For each "**<valx>**" parameter value, please refer to the corresponding command

2.20.4 Parameter Storage

None

2.20.5 Examples

Command	Responses
AT&V *Note: Display active parameters in RAM*	**Telecom Design TD1202** **Hardware Version: 0F** **Software Version: SOFT1100** **S/N: 00001058** **ACTIVE PROFILE** **E1 V1 Q0 X1 S200:0 S300:24 S301:2** **S302:14 S303:1** **OK** *Note: Done for echo.*

2.21 Save Configuration &W

2.21.1 Description

This command writes the active configuration into a non volatile memory (Flash).

2.21.2 Syntax

Action Command

AT&W
OK

Read Command

None

Test Command

None

2.21.3 Parameters and Defined Values

None

2.21.4 Parameter Storage

None

2.21.5 Examples

Command	Responses
ATS302=10 *Note: change transmission power in volatile memory only*	**OK**
AT&W	**OK**
ATZ *Note: reset the TD1202 module*	**OK**
ATS302?	**10** **OK** *Note: Default value set back from Flash memory*

2.22 SIGFOX™ Send RF Message $SS

2.22.1 Description

This command sends a SIGFOX™ RF message.

2.22.2 Syntax

Action Command

AT$SS=[<hex_byte1>[[ ]..<hex_byte2>]..]
OK

Note: There can be from 1 to 12 **<hex_bytex>** *parameter values, optionally separated by single or multiple space or tabulation characters.*

Read Command

None

Test Command

None

2.22.3 Parameters and Defined Values

Parameter	Value	Description
<hex_bytex>		**SIGFOX™ Message Byte Value Parameter**
	00..FF	2-digit hexadecimal byte value ('**0**' to '**9**', '**a**' to '**f**' and '**A**' to '**F**' characters are valid) There can be from 1 to 12 **<hex_bytex>** parameter values, optionally separated by single or multiple space (IA5 2/0) or tabulation (IA5 0/9) characters

2.22.4 Parameter Storage

None

2.22.5 Examples

Command	Responses
AT$SS=0D 0A	**OK** *Note: Transmission of 2 hexadecimal bytes "***0D 0A***" completed*

2.22.6 Notes

If the message length is greater than 1 and is odd, a null padding byte is appended at the end of the message.

2.23 SIGFOX™ Send RF Test Message $ST

2.23.1 Description

This command sends a SIGFOX™ test RF message.

2.23.2 Syntax

Action Command

AT$ST=[<count>[,<period>[,<channel>[,<retries>]]]]
OK

Read Command

None

Test Command

None

2.23.3 Parameters and Defined Values

Parameter	Value	Description
<count>		**SIGFOX™ Test Message Count Parameter**
	0..65535	Count of SIGFOX™ test RF messages (default value is 10).
<period>		**SIGFOX™ Test Message Period Parameter**
	1..255	Period in seconds between SIGFOX™ test RF messages (default value is 10 seconds).
<channel>		**SIGFOX™ Test Message Channel Parameter**
	-1	Use automatic channel selection (default value).
	0..180 or 220..400	Channel number to use for SIGFOX™ test RF messages. Channels have a fixed 100 Hz bandwidth, starting at 868.180 MHz for channel 0, ending at 868.198 Mhz for channel 180, restarting at 868.202 MHz for channel 220 and ending at 868.220 MHz for channel 400.

2.23.4 Parameter Storage

None

2.23.5 Examples

Command	Responses
AT$ST=10,30,-1 *Note: send a SIGFOX™ test message 10 times every 30 s, each message is sent once, using automatic channel selection*	**OK** *Note: Test done*

3 TD1202 SIGFOX™-Compatible Command Set Reference

This section provides a reference for the SIGFOX™-compatible commands implemented by the TD1202 Module.

3.1 TD1202 Factory Settings

A serial link handler is set with the following default values (factory settings):

- LVTTL electrical level
- Speed 9600 bps
- 8 data bits
- 1 stop bit
- No parity
- No hardware/software flow control

For compatibility with the SIGFOX™ command set, the character echo and AT result codes are suppressed temporarily (i.e. "**ATE0**" and "**ATQ1**") while a SIGFOX™ command is interpreted.

3.2 SIGFOX™ Commands Presentation Rules

The SIGFOX™ commands are presented in the present documentation as follows:

- A 'Description' section provides general information on the SIGFOX™ command (or response) behavior
- A 'Syntax' section describes the command and response syntaxes and all parameters description
- A 'Parameters' section describes all parameters and values
- An 'Examples' section presents the real use of the described command
- A 'Notes' section can also be included indicating some remarks about the command use

Figures are provided where necessary.

The commands will be listed alphabetically.

3.3 Information Responses and Result Codes

If command syntax is incorrect or the command contains wrong parameters, or the command cannot be executed successfully, the "**KO;**" string is returned.

If the command line has been executed successfully, an "**OK;**" string is returned. Unlike AT responses, they do not contain any "**<CR>**" or "**<LF>**" characters.

3.4 SIGFOX™ Command Syntax Format

SIGFOX™ Commands always start with "**SF**" and finish with a "**;**" character, and unlike AT commands, they do not contain any "**<CR>**" or "**<LF>**" characters.

A “**<NUL>**” character (ASCII code 0) can be used to resynchronize the interpreter to the beginning of a SIGFOX™ command.

3.5 SIGFOX™ ID

3.5.1 Description

This command returns the TD1202 module SIGFOX™ ID.

3.5.2 Syntax

Action Command

SFID;<id>OK;

3.5.3 Parameters and Defined Values

Parameter	Value	Description
<id>		**SIGFOX™ ID Parameter**
	2 binary bytes **ab**	If the SIGFOX™ ID is <= 0xFFFF, the TD1202 module transmits the SIGFOX™ ID as 2 binary characters, with most significant byte "**a**" in the first position, and least significant byte "**b**"in the second position
	4 binary bytes **abcd**	If the SIGFOX™ ID is > 0xFFFF, the TD1202 module transmits the SIGFOX™ ID as 4 binary characters, with most significant byte "**a**" first, and least significant byte "**D**" last, with intermediate bytes "**b**" and "**c**" ordered from most significant to least significant

3.5.4 Examples

Command	Responses
SFID;	**1AOK;** *Note: SIGFOX™ ID is 0x3141*
SFID;	**1A2BOK;** *Note: SIGFOX™ ID is 0x31413242*

3.5.5 Notes

The example SIGFOX™ IDs above have been chosen specifically, so that their binary value corresponds to ASCII printable characters. However, this is not generally the case.

3.6 SIGFOX™ Keepalive K

3.6.1 Description

This command toggles the TD1202 module SIGFOX™ keepalive feature on or off.

3.6.2 Syntax

Action Command

SFK<state>;OK;

3.6.3 Parameters and Defined Values

Parameter	Value	Description
<state>		**SIGFOX™ ID Parameter**
	'**0**'	The ASCII digit value '**0**' turns the TD1202 SIGFOX™ keepalive feature off
	'**1**'	The ASCII digit value '**1**' turns the TD1202 SIGFOX™ keepalive feature on

3.6.4 Examples

Command	Responses
SFK0;	**OK;** *Note: turns off the SIGFOX™ keepalive feature*
SFK1;	**OK;** *Note: turns on the SIGFOX™ keepalive feature*

3.7 SIGFOX™ Send Single Byte m

3.7.1 Description

This command sends a single-byte SIGFOX™ RF message.

3.7.2 Syntax

Action Command
SFm<byte>;OK;SENT;

3.7.3 Parameters and Defined Values

Parameter	Value	Description
<byte>		**SIGFOX™ Single Data Byte Parameter**
	Single binary byte **a**	The single binary byte "**a**" to send in a SIGFOX™ RF message

3.7.4 Examples

Command	Responses
SFmA;	**OK;SENT;** *Note: the binary byte 0x41 ('A') is sent into a SIGFOX™ RF message* *The "***OK;***" response is obtained when the command is accepted, the "***SENT;***" response is only obtained once the transmission has been performed (this may take a few seconds).*

3.7.5 Notes

The example **<byte>** value above has been chosen specifically, so that its binary value corresponds to an ASCII printable character. However, this is not generally the case.

3.8 SIGFOX™ Send Multiple Bytes M

3.8.1 Description

This command sends a multiple-byte SIGFOX™ RF message.

3.8.2 Syntax

Action Command

SFM<length><byte1>..<bytex>;OK;SENT;

3.8.3 Parameters and Defined Values

Parameter	Value	Description
<length>		**SIGFOX™ Multiple Byte Length Parameter**
	Single binary byte **a** 0..12	The single binary byte "**a**" specifies the length of SIGFOX™ RF message payload, and must be in the range 0 to 12 inclusive
<bytex>		**SIGFOX™ Multiple Byte Value Parameter**
	From 0 to 12 bynary bytes	From 0 to 12 binary bytes that provide the SIGFOX™ RF message payload

3.8.4 Examples

Command	Responses
SFM<FF>Hello, world;	**OK;SENT;** *Note: the 12 binary bytes "0x48 0x65 0x6c 0x6c 0x6f 0x2c 0x20 0x77 0x6f 0x72 0x6c 0x64" corresponding to the ASCII code for the characters in the "Hello, world" string are sent into a SIGFOX™ RF message. The "***<FF>***" character has an ASCII code value of 12. The "***OK;***" response is obtained when the command is accepted, the "***SENT;***" response is only obtained once the transmission has been performed (this may take a few seconds).*

3.8.5 Notes

The example **<bytex>** values above have been chosen specifically, so that their binary value corresponds to ASCII printable characters. However, this is not generally the case.

If the message length is greater than 1 and is odd, a null padding byte is appended at the end of the message.

3.9 SIGFOX™ Present P

3.9.1 Description

This command always returns OK.

3.9.2 Syntax

Action Command
SFP;OK;

3.9.3 Parameters and Defined Values

None

3.9.4 Examples

Command	Responses
SFP;	**OK;** *Note: TD1202 is ready*

3.10 SIGFOX™ Version v

3.10.1 Description

This command always returns the SIGFOX™ protocol version number.

3.10.2 Syntax

Action Command

SFv;<version>OK;

3.10.3 Parameters and Defined Values

Parameter	Value	Description
<version>		**SIGFOX™ Single Data Byte Parameter**
	2 ASCII digits **ab**	The SIGFOX™ protocol version number as a fixed-length 2 ASCII digit number '**ab**'

3.10.4 Examples

Command	Responses
SFv;	**01OK;** *Note: SIGFOX™ protocol version 1*

DOCUMENT CHANGE LIST

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- First Release

NOTES:

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