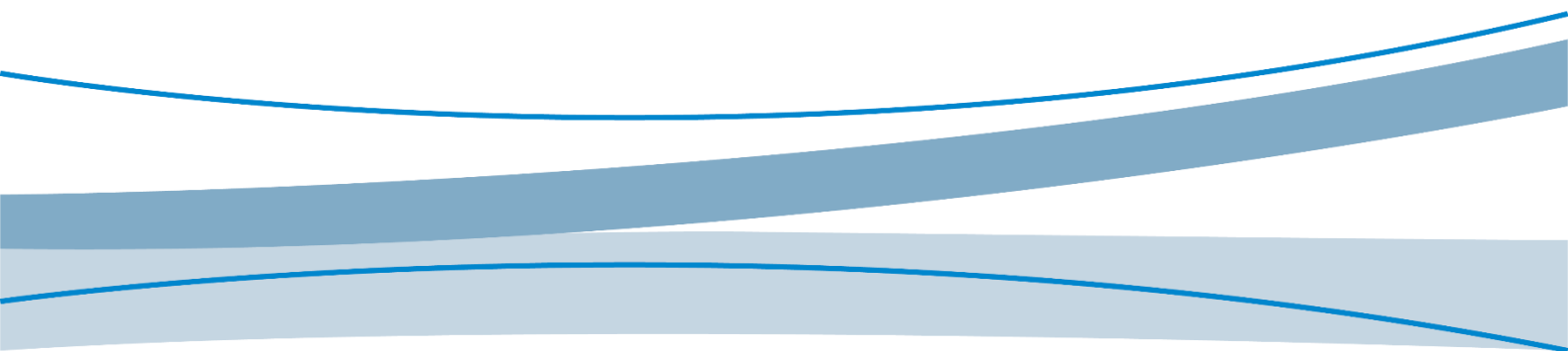




FG132

Non-Signaling Function Application Guide

V1.3



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Safety Instructions

Do not operate wireless communication products in areas where the use of radio is not recommended without proper equipment certification. These areas include environments that may generate radio interference, such as flammable and explosive environments, medical devices, aircraft or any other equipment that may be subject to any form of radio interference.

The driver of any vehicle shall not operate wireless communication products while controlling the vehicle, otherwise will be reduced the driver's control of the vehicle , resulting in safety risks.

Wireless communication devices do not guarantee effective connection under any circumstances, such as when the (U) SIM card is invalid or the device is in arrears. In an emergency, please use the emergency call function when the device is turned on, and ensure that the device is located in an area with sufficient signal strength.

Contents

Applicable Model	2
Change History	3
1 Purpose	4
1.1 Purpose	4
2 Non-Signaling TX, RX Test Commands	5
2.1 AT Command Description	5
2.1.1 +GTNSMODE, set non-signaling test mode	5
2.1.2 +GTNSCFG, configure carrier parameters	6
2.1.3 +GTNSRXLEVEL, get the RXLevel value	10
2.1.4 +GTNSTXSTART, start transmitting power	11
2.1.5 +GTNSTXSTOP, stop transmitting power	12
2.2 X35 Series Non-signaling Test Examples	13
2.2.1 Example of RX Test Command Sequence	13
2.2.2 Example of TX Test Command Sequence	13

Applicable Model

No.	Applicable Model	Description
1	FG132 series	X35

Change History

V1.3 (2024-05-07)	Modify AT Command format
V1.2 (2024-04-17)	Modify +GTNSCFG Command format and example
V1.1 (2024-04-01)	Modify +GTNSCFG Command
V1.0 (2024-03-12)	Initial version.

1 Purpose

1.1 Purpose

The non-signaling AT command format of each platform of Fibocom is unified and standardized.

2 Non-Signaling TX, RX Test Commands

2.1 AT Command Description

2.1.1 +GTNSMODE, set non-signaling test mode

Description

This command is used to set and query the non-signaling test mode

Format

Type	Command	Response
Setting command	AT+GTNSMODE=<mode>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTNSMODE?	Response 1: +GTNSMODE: <mode>
		OK Response 2: ERROR
Query current parameter range	AT+GTNSMODE=?	Response: +GTNSMODE: (0,1) OK

Parameter

Name	Description	Value
mode	Setting value of non-signaling test mode	0: Exit non-signaling test mode (default)

1: Enter non-signaling test mode

Note	1. Saving after power failure. 2. Setting value of non-signaling test mode, auto restart and take effect
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Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	Yes	Require Data Store at Power Down	Yes
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

```

AT+GTNSMODE=?      ❶
+GTNSMODE: (0,1)

OK

AT+GTNSMODE=1      ❷

OK

AT+GTNSMODE?      ❸
+GTNSMODE: 1

OK

```

❶ Query current parameter range

❷ Setting command

❸ Read current settings

2.1.2 +GTNSCFG, configure carrier parameters

Description

This command is used to set the LTE/NR carrier parameters.

Format

Type	Command	Response
------	---------	----------

Setting command	AT+GTNSCFG=<rat>,<band>,<ant_num>,<dl_channel>,<ul_channel>,<expected_level>,<power>,<bandwidth>,<mcs>,<rb_start>,<rb_num>,<scs>]	Response 1: OK Response 2: ERROR
Remarks	<p>LTE mandatory parameters: <rat>,<band>,<ant_num>,<dl_channel>,<ul_channel>,<expected_level>,<power>,<bandwidth>,<mcs>,<rb_start>,<rb_num></p> <p>NR mandatory parameters: <rat>,<band>,<ant_num>,<dl_channel>,<ul_channel>,<expected_level>,<power>,<bandwidth>,<mcs>,<rb_start>,<rb_num>,<scs></p> <p>It should set the parameter to the correct value, otherwise, the module will be lead to abnormal when the incorrect value that not support input</p>	

Parameter

Name	Description	Value
rat	System setting value	type: Integer
		1: LTE 2: NR
band	Band setting value	type: Integer
		LTE values: 1: Band1 2: Band2
		NR values: 1: N1 2: N2
ant_num	Antenna setting value	type: Integer
		0 ant1 1 ant2

dl_channel	dl channel setting value	type: Integer Comply with 3GPP standard , Center channel value
ul_channel	ul channel setting value	type: Integer Comply with 3GPP standard , Center channel value
expected_level	Setting value of expected receiving level	type: Negative integer Comply with 3GPP standard, in dBm.
power	tx power setting value	type: Integer Value range: 0-230
bandwidth	Bandwidth setting value	type: Integer LTE values: 0: 1.4M 1: 3M 2: 5M 3: 10M 4: 15M 5: 20M
		NR values: 0: 5MHz 1: 10MHz 2: 15MHz 3: 20MHz 4: 25MHz 5: 30MHz 6: 40MHz 7: 50MHz 8: 60MHz

		9: 80MHz
		10: 90MHz
		11: 100MHz
		type: Integer
		LTE values:
		0: QPSK
		1: 16QAM
		2: 64QAM
		3: 256QAM
mcs	mcs setting value	
		NR values:
		0: QPSK
		1: 16QAM
		2: 64QAM
		3: 256QAM
		4 BPSK
rb_start	rb start setting value	type: Integer
		Comply with 3GPP standard
rb_num	rb number setting value	type: Integer
		Comply with 3GPP standard
		type: Integer
		0: 15kHz
		1: 30kHz
		2: 60kHz
scs	scs setting value	3: 120kHz
		4: 240kHz
		Note: Only NR has scs parameter, LTE have no scs parameter.
		For general test, the value is 1 when the upper and lower

channels are the same, and 0 when they are different.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

```
AT+GTNSCFG=2,1,0,428000,390000,-600,230,1,0,12,25,0 ①
```

OK

① Setting command

2.1.3 +GTNSRXLEVEL, get the RXLevel value

Description

This command is used to get the Rx Level value.

Format

Type	Command	Response
Setting command	AT+GTNSRXLEVEL	Response 1: OK +GTNSRXLEVEL: <rx level> Response 2: ERROR

Parameter

Name	Description	Value
rx level	Actual received level in dBm	type: Negative integer

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Async command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	500	Max Result Returning Duration (ms)	2000

Example**AT+GTNSRXLEVEL** ❶

OK

+GTNSRXLEVEL: -59 dbm

❶ Setting command

2.1.4 +GTNSTXSTART, start transmitting power

Description

This command is used to start transmitting power.

Format

Type	Command	Response
Setting command	AT+GTNSTXSTART	Response 1: OK Response 2: ERROR

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 2000

Max Result Returning Duration (ms) 2000

Example

AT+GTNSTXSTART ①

OK

① Setting command

2.1.5 +GTNSTXSTOP, stop transmitting power

Description

This command is used to stop transmitting power.

Format

Type	Command	Response
Setting command	AT+GTNSTXSTOP	Response 1: OK
		Response 2: ERROR

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

AT+GTNSTXSTOP ①

OK

① Setting command

2.2 X35 Series Non-signaling Test Examples

2.2.1 Example of RX Test Command Sequence

- ❶ Set the non-signaling test mode.
- ❷ Set RX carrier parameters.
- ❸ Get the RX Level value.

Example of LTE Command Sequence

```
AT+GTNSMODE=1 ->❶
OK
AT+GTNSCFG=1,1,0,300,18300,-600,230,3,0,0,12 ->❷
OK
AT+GTNSRXLEVEL ->❸
OK

+GTNSRXLEVEL: -59 dbm
```

Example of NR Command Sequence

```
AT+GTNSMODE=1 ->❶
OK
AT+GTNSCFG=2,1,0,428000,390000,-600,230,1,0,12,25,0 ->❷
OK
AT+GTNSRXLEVEL ->❸
OK

+GTNSRXLEVEL: -59 dbm
```

2.2.2 Example of TX Test Command Sequence

- ❶ Set the non-signaling test mode.
- ❷ Set TX carrier parameters.
- ❸ Execute TX Start.

④ Execute TX Stop.

Example of LTE Command Sequence

```
AT+GTNSMODE=1 -> ①
OK
AT+GTNSCFG=1,1,0,300,18300,-600,100,3,0,0,12 -> ②
OK
AT+GTNSTXSTART -> ③
OK
AT+GTNSTXSTOP -> ④
OK
```

Example of NR Command Sequence

```
AT+GTNSMODE=1 -> ①
OK
AT+GTNSCFG=2,1,0,428000,390000,-600,230,1,0,12,25,0 -> ②
OK
AT+GTNSTXSTART -> ③
OK
AT+GTNSTXSTOP -> ④
OK
```