GK9501 Input-output format document

Legal notices

If you receive this document from Hunan Guoke Microelectronics Co., Ltd. (hereinafter referred to as "Guoke Micro"), it means that you have agreed with the following terms. If you do not agree to the following terms, please stop using this document。

This document is copyrighted by Hunan Guoke Microelectronics Co., Ltd., and reserves any rights not expressly granted in this document. Without the prior written permission of Guoke Micro, no unit or individual may copy, transmit, distribute, use or leak the document and any pictures, forms, data and other information contained in the document.

The Company reserves the right to make modifications and improvements to the products described in this manual without prior notice; We reserve the right to revise or retract this manual at any time.

If there is any unclear text in this user manual, please consult the company or agents or sellers in time.

1.GKC interface data format

The Goke Command (GKC) interface is an interface for interaction between the user and the GK9501. Its command format is as follows:

$PGKC	Command	Arguments	*	CheckSum	CR	LF

Command： Represents the command number sent, with specific values referred to below.

Arguments： Represents the parameters required to send commands, parameters can be multiple, different commands correspond to different data, the specific values refer to the following.

***：** Flag of end of data

CheckSum： For the validation data of the entire command, the CheckSum value is in the entire command starting from PGKC to *Before argument is an all-or-so value, such as "$PGKC030,3,1", its check value is "PGKC03 0,3, An XOR value of 1" with an XOR value of 2E

CR，LF： Package end flag

Sample data： $PGKC030,3,1*2E <CR><LF>

2.GKC command

1、Command:001

Reply to the message, in response to the result of the processing of the message sent by the other party

Arguments:

Arg1: The command of the message that the message replies to. Arg2:

"1", Received messages are not supported

"2", Valid message, but incorrect execution

"3", Valid message, and the execution is correct

Example:

Send a single GPS command:

$PGKC115,1,0,0,0*2B<CR><LF>

Reply to the message:

$PGKC001,115,3,1,0,0,0,0,1*28<CR><LF>

2、Command: 030

System reboot command

Arguments:

Arg1: "1", warm boot

"2", Warm

start

“3”, cold

boot

‘4”, Full

cold start

Arg2: ‘1’, Software reboot

‘2’, Hardware reboot

‘3’, Clear nvram, leave flash reboot

Example:

Full cold boot command:

$PGKC030,4,2*2A<CR><LF>

Warm boot

command:$PGKC030,1,1*2C<CR><LF>

Note: Both warm start and warm start Arg2 are set to 1, and full cold start has Arg2 is 1 2,3 These three cases. In normal cases, cold start is used as a full cold start mode, with Arg1 set to 4, Arg2 set to 2, and hardware boot

The way of moving, not the use of software startup mode.

3、Command:040

Erases ancillary information from flash

Arguments:

Not

Example :
$PGKC040*2B<CR><LF>

4、Command: 051

Enter standby low-power mode

Arguments:

Arg1: "0", stop mode

Example:

$PGKC051,0*37<CR><LF>

The command can be woken up by sending any command, invalid commands

can also be, the hardware can be woken up by plugging and unplugging the serial port, and the original low-power command can be sent directly.

5、Command: 101

Configure the interval (in ms) at which NMEA messages are output

Arguments:

Arg1: 100-10000

Example:

$PGKC101,1000*02<CR><LF>

The command is set to output NMEA data every 1000ms, that is, 1s.

Note: When setting the message interval output above 2HZ, first increase the baud rate to more than 115200 to ensure the high-frequency NMEA message output, the command is not saved in Flash, After power loss, it reverts to the original NMEA output frequency.

6、Command: 105

Enter a periodic low-power mode

Arguments:

Arg1: "0", normal operating mode

"1", cycle ultra-low power tracking mode

"4", directly into the ultra-low power tracking mode

"8",a low-power mode, can be woken up via serial port via command

Arg2: Runtime (ms)which works in a periodic mode with Arg1 of 1.

Arg3: Sleep time (milliseconds)which works in cycle mode where Arg 1 is 1.

Example:

$PGKC105,8*3F<CR><LF

$PGKC105,1,5000,8000*3B<CR><LF

7、Command: 115

Set the star search

modeArguments:

Arg1: "1", GPS on

"0", GPS off

Arg2: "1", Glonass on

"0", Glonass off

Arg3: "1", Beidou on

"0", Beidou off

Arg4: "1", Galileo on

"0", Galileo off

Example:

Set the star search mode single GPS mode, the command is as follows:

$PGKC115,1,0,0,0*2B<CR><LF>

Note: Although the single Galileo mode command is set to $PG KC115,0 , 0,0,1*2 B can send successfully but is currently G K 9501 Firmware does not yet support Galileo star search mode.

8、Command: 121

Set the star search mode and save to flash

Arguments:

Arg1: "1", GPS on

"0", GPS off

Arg2: "1", Glonass on

"0", Glonass off

Arg3: "1", Beidou on

"0", Beidou off

Arg4: "1", Galieo on

"0", Galieo off

Example:

Set the star search mode to single GPS mode

$PGKC121,1,0,0,0*2C<CR><LF>

The difference between command115 and 121 commands is that the 115

command will not be saved in flash after setting, the star search mode set after restart will disappear, and the command setting of 121 will be saved in flash. The star search mode set after the restart will be retained, and neither 115 nor 121 supports the Galileo galaxy.

9、Command: 146

Set the serial port input and output format and baud rate

Arguments:

Arg1: "3", NMEA format

Arg2: "3", NMEA format

Arg3: 9600, 19200, 38400, 57600, 115200……921600.

Example:

$PGKC146,3,3,9600*0F<CR><LF>

10、Command: 147

Sets the NMEA output baud rate

Arguments:

Arg1: 9600, 19200, 38400, 57600, 115200……921600.

Example:

$PGKC147,115200*06<CR><LF>

11、Command:047

Delete theGPD file in Flash

Arguments:

none

Example:

$PGKC047*2C<CR><LF>

12、Command: 149

Set the NMEA serial port parameters

Arguments:

Arg1: "0", NMEA data

"1", Binary data

Arg2: 9600，19200，38400，57600，115200……921600.

Example:

$PGKC149,0,38400*2C<CR><LF>

$PGKC149,1,115200*15<CR><LF>

Note: This command is typically used in AGPS to load a GPD file into Flash.

13、Command: 161

PPS Set

Argument

s:

Arg1: "0", Closes the PPS output

"1", First fix

"2", 3D fix

"3", 2D/3D fix

"4", Always on

Arg2: PPS Pulse width （ms）

Arg3: PPS Pulse cycle （ms）

Example:

$PGKC161,2,500,2000*0<CR><LF>

Note: Where ppS pulse width is up to 998ms, minimum is 1ms, and the minimum pulse period range is 1000ms。

14、Command: 201

Query the interval of NMEA messages

Arguments:

无

Example:

$PGKC201*2C<CR><LF>

15、Command: 202

Returns the interval of the NMEA message (answering the 201 command).

Arguments:

None

Example:

$PGKC202,1000,0,0,0.0,0.0*02<CR><LF>

16、Command: 239

Turns the SBAS feature on or off

Arguments:

Arg1: "0", Shut down

"1", Open

Example:

$PGKC239,1*3A<CR><LF>

17、Command: 240

Query whether SBAS is enabled

Arguments:

None

Example:

$PGKC240*29<CR><LF>

18、Command: 241

Returns whether SBAS is enabled (answers the 240 command).

Arguments:

Arg1: "0", cloese

"1", open

Example:

$PGKC241,1*35<CR><LF>

19、Command: 242

Sets the NMEA statement output frequency

Arguments:

Arg1: GLL

Arg2: RMC

Arg3: VTG

Arg4: GGA

Arg5: GSA

Arg6: GSV

Arg7: GRS

Arg8: GST

Arg9~Arg21: reta in

Example:

$PGKC242,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0*37 <CR><LF>

20、Command: 243

Query the NMEA statement output frequency

Arguments:

None

Example:

$PGKC243*2A<CR><LF>

21、Command: 244

Returns the NMEA statement output frequency (answering command 243).

Arguments:

Args: See 242

Instructions

Example:

$PGKC244,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0*31<CR><LF>

22、Command: 269

Sets the reference coordinate system

Arguments:

Arg1: "0", WGS84

Example:

$PGKC269,0*3E<CR><LF>

23、Command: 270

Query the reference coordinate system

Arguments:

None

Example:

$PGKC270*2A<CR><LF>

24、Command: 271

Returns the reference coordinate system (answers the 270 command)

Arguments:

Arg1: See 269

Instructions

Example:

$PGKC271,0*37<CR><LF>

25、Command: 279

Query the RTC time

Arguments:

None

Example:

$PGKC279*23<CR><LF>

26、Command: 280

Returns the RTC time (answering the 279 command).

Arguments:

Args: See 278 Instructions

Example:

$PGKC280,2017,3,15,12,0,0*15<CR><LF>

27、Command: 284

Set the speed threshold to output 0 when the speed is below the threshold

Arguments:

Arg1:

Thresh old values

Example:

$PGKC284,0.5*26<CR><LF>

Note: Where the speed unit is m/s, if the speed is set to a negative number, the command does not take effect, maintaining the original speed threshold output.

28、Command: 356

Set the HDOP threshold, the actual HDOP is greater than the threshold value, no positioning

Arguments:

Arg1:

Thresh

old values

Example:

$PGKC356,0.7*2A<CR><LF>639

29、Command: 357

Get the HDOP

threshold

Arguments:

None

Example:

$PGKC357*2E<CR><LF>

30、Command: 462

Queries the version

number of the current

software

Arguments:

None

Example:

$PGKC462*2F<CR><LF>

31、Command: 463

Returns the version number of the

current software (answer the 462 command)

Arguments:

None

Example:

$PGKC463,GK9501_2.0_Aug 10 2020,GOKE microsemi *3F<CR><LF>

32、Command: 639

Set approximate location and time information to speed up positioning

Arguments:

Arg1: Latitude, for example: 2 8.166450

Arg2: Longitude, for example: 120 389700

Arg3: Height, for example: 0

Arg4: year

Arg5: month

Arg6: day

Arg7: hour, The time is UTC time interval

Arg8: minute

Arg9: second

Example:

$PGKC639,28.166450,120.389700,0,2017,3,15,12,0,0*33<CR><LF>

Note: Where the latitude and longitude units are degrees and the height is meters

33、Command: 786

Set the positioning mode

Arguments:

Arg1: "0", Normal mode

"1", Fitness mode, suitable for

walking and jogging

"2", Aero mode, suitable for high-speed sports mode

"3", Balloon mode, for elevation mode

Example:

$PGKC786,1*3B<CR><LF>

34、Command: 490

Queries the current FLASH unique ID information.

Arguments:

无

Example:

$PGKC490*22<CR><LF>

35、Command: 491

Returns the current FLASH unique ID information (answering the 490 command).

Arguments:

Arg1: 1 ManufacturerID and DeviceID of FLASH, for example: 1351

Arg2: UniqueID1, For example：32334C30,AE000230

Arg3: UniqueID2, For example：FF507900,FFFFFFFF

Example:

$PGKC491,1351,32334C30,AE000230,FF507900,FFFFFFFF,*5E<CR><LF>

27、 Support for the NMEA0183 protocol

GK9501 supports NMEA0183 V 4.1 protocol and is compatible with previous versions, about NMEA0183 V4. Detailed information for 1 can be referred to NMEA 0183 V4 1 Official documentation.

Common output formats are

as follows:

GGA: Time, location,

number of satellites

GSA: GPS receiver operation mode, positioning used

satellite, DOP value, positioning status

GSV: Visible GPS satellite information, elevation

angle, azimuth angle, signal-to-noise ratio RMC: time,

date, location, speed

VTG: Ground speed information

Statement Identifier:

identifier	Meaning
BD	BDS, Beidou II satellite system
GP	GPS
GL	GLONASS
GA	Galileo
GN	GNSS, Global Navigation Satellite System

GGA

$--GGA,hhmmss.ss,llll.ll,a,yyyyy.yy,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx*hh

Sample data：$GPGGA,065545.789,2109.9551,N,12023.4047,E,1,9,0.85,18.1,M,8.0,M,,*5E

name	Example	unit	description
message ID	$GPGGA		GGA Protocol header
UTC Time	065545.789		hhmmss.sss
latitude	2109.9551		ddmm.mmmm
N/S instructions	N		N=north, S=south
longitude	12023.4047		dddmm.mmmm
E/W	E		W=west, E=east

instructions			

Positioning indication			0:Not targeted 1:SPS Mode, positioning is effective 2:差分, SPS Mode, positioning is effective 3:PPS Mode, positioning is effective
Number of satellites	9		Range 0 to 12
HDOP	0.85		Horizontal accuracy
MSL amplitude	18.1	Meter	
unit	M	Meter	
earth	-2.2	Meter	
unit	M		-
Differential time	8.0	second	Invalid when there is no DGPS
difference ID	0000		
checksum	*5E		
<CR><LF>			End of message

GSA

$--GSA,a,a,x,x,x,x,x,x,x,x,x,x,x,x,x,x,x.x,x.x,x.x*hh

Sample data：$GPGSA,A,3,10,24,12,32,25,21,15,20,31,,,,1.25,0.85,0.91*04

name	Example	unit	desc ript

			ion
message ID	$GPGS		GSA Protocol header
mode 1	A		M=Manually, forced in 2D or 3D mode A=automatic

mode 2	3		1:Invalid positioning 2:2D positioning 3:3D positioning
Satellite use	10		Channel 1
Satellite use	24		Channel 2
Satellite use	12		Channel 3
Satellite use	32		Channel 4
Satellite use	25		Channel 5
Satellite use	21		Channel 6
Satellite use	15		Channel 7
Satellite use	20		Channel 8
,,,	,,,	,,,	,,,
Satellite use			Channel 12
PDOP	1.25		Position accuracy
HDOP	0.85		Horizontal accuracy
VDOP	0.91		Vertical accuracy
checksum	*04		
<CR><LF>			End of message

GSV

$--GSV,x,x,x,x,x,x,x,...*hh

Sample data:

$GPGSV,3,1,12,14,75,001,31,32,67,111,38,31,57,331,33,26,47,221,20*73

$GPGSV,3,2,12,25,38,041,29,29,30,097,32,193,26,176,35,22,23,301,30*47

$GPGSV,3,3,12,10,20,185,28,44,20,250,,16,17,217,21,03,14,315,*7D

name	Example	unit	description
The message ID	$GPGSV		GSV protocol header
The number of messages	3		Range 1 to 3
Message number	1		Range 1 to 3
Number of satellites	12		
Satellite ID	14		Range 1 to 32
elevation	75	degree	90° maximum
azimuth	001	degree	Range 0 to 359°
Load-to-noise ratio (C/No)	31	dBHz	The range is 0 to 99, empty when there is no trace
Satellite ID	32		Range 1 to 32
elevation	67	degree	90° maximum
azimuth	111	degree	Range 0 to 359°
Load-to-noise ratio (C/No)	38	dBHz	The range is 0 to 99, empty when there is no trace
Satellite ID	31		Range 1 to 32
elevation	57	degree	90° maximum
azimuth	331	degree	Range 0 to 359°
Load-to-noise ratio (C/No)	33	dBHz	The range is 0 to 99, empty when there is no trace
Satellite ID	26		Range 1 to 32
elevation	47	degree	90° maximum

azimuth	221	degree	Range 0 to 359°
Load-to-noise ratio (C/No)	20	dBHz	The range is 0 to 99, empty when there is no trace

checksum	*73		
<CR><LF>			End of message

RMC

$--RMC,hhmmss.ss,A,llll.ll,a,yyyyy.yy,a,x.x,x.x,xxxx,x.x,a*hh

Sample data:

$GPRMC,100646.000,A,3109.9704,N,12123.4219,E,0.257,335.62,291216,,,A*59

name	Example	unit	description
message ID	$GPRMC		RMC Protocol header
UTC Time	100646.000		hhmmss.ss
state	A		A=Valid data; V= Invalid data
latitude	2109.9704		ddmm.mmmm
N/S instructions	N		N = North, S = South
longitude	11123.4219		dddmm.mmmm
E/W instructions	E		W = West, E = East
Ground speed	0.257	Knot (byte)	
azimuth	335.62	degree	
date	291216		ddmmyy
Magnetic variables			-
checksum	*59		

<CR><LF>			End of message

VTG

$--VTG,x.x,T,x.x,M,x.x,N,x.x,K*hh

Sample data：$GPVTG,335.62,T,,M,0.257,N,0.477,K,A*38

name	Example	unit	description
message ID	$GPVTG		VTG Protocol header
azimuth	335.62	degree	
reference	T		True
azimuth	335.62	degree	
reference	M		Magnetic
velocity	0.257	Knot（byte）	
unit	N		Byte
velocity	0.477	km/h	
unit	K		km/h
unit	A		Locate the system mode indication: A—Autonomous mode; D—Differential mode; E—Estimation (dead reckoning) mode; M—Manual input mode; S—Simulator mode; N—Invalid data。

checksum	*10		
<CR><LF>			End of message