



Progress NAVIA PN6280
TCP/IP AT Command
Application notes
V1.0



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Version History

Date	Version	Modify records
2020-02-20	V1.0	First release



Content

Content	3
1 Summary	4
2 Initialize the configuration	5
3 TCPIP Non-transparent mode.....	6
3.1 <i>Single Connection.....</i>	6
3.2 <i>Multiple Connections</i>	8
4 TCPIP Transparent mode	10
4.1 <i>Single Connection.....</i>	10
4.2 <i>Multiple Connections</i>	11
5 HTTP/HTTPS.....	12
5.1 <i>Set up the network environment</i>	12
5.2 <i>HTTP Operation process.....</i>	12
5.3 <i>HTTPS Operation process.....</i>	13
6 FTP.....	14
6.1 <i>Set up the network environment</i>	14
6.2 <i>FTP Download file</i>	14
6.3 <i>FTP Upload file.....</i>	15
6.4 <i>FTP Download file to FS.....</i>	16
7 FOTA	17
7.1 <i>Set up the network environment</i>	17
7.2 <i>FOTA Process</i>	17
8 TCP SERVER.....	19
8.1 <i>Set up the network environment</i>	19
8.2 <i>TCP Server Operation process</i>	19
8.3 <i>UDP Server Operation process</i>	20



1 Summary

PN6280 module has built-in TCP / IP protocol stack. Customers can send AT commands to complete the TCP / IP, HTTP, HTTPS, FTP settings, connections, communications, shut down and other functions.

In this paper, we mainly introduce the use of TCP / IP, HTTP, HTTPS, and FTP functions embedded in PN6280 module and some exception handling instructions based on practical examples.



2 Initialize the configuration

After the module is powered on, before TCP/IP, HTTP, HTTPS, FTP connection, you need to set a fixed baud rate and detect SIM card status and network status.

AT cmd	Response	Command Description
AT+CPIN?	+CPIN:READY	Check the SIM card status: First make sure the SIM card PIN is resolved. Return "+CPIN: READY" to indicate that the SIM card has detected and the PIN has been resolved.
AT+CREG?	+CREG:0,1	Look for network status: Return "+CREG: 0,1" indicates that the network is successfully searched. If it is not successful, you can continue to execute the command AT+CREG? Query. This can also be done by setting the command AT+CREG=1 at the beginning to enable automatic reporting of network status changes. In this way, waiting for the +CREG: 1 or +CERG: 5 automatic report on it.



3 TCP/IP Non-transparent mode

3.1 Single Connection

When the application needs only a single TCP/sIP connection, you can use single connection.

After the initial configuration is completed, the following is an example of a single process:

AT cmd	Response	Command Description
AT	OK	
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBIM",1,1	OK	Connect to the network.
AT+CIPMUX=0	OK	Set to single connection mode, Power-on default is single connection mode.
AT+CIPSTART="TCP", "58.246.1.50", "60000"	OK Or ERROR Or ALREADY CONNECT Or CONNECT FAIL Or CONNECT OK	Connect TCP server address "58.246.1.50:62009", The return is as follows: 1. returns "CONNECT OK": The syntax of the command is correct and the current status, TCP connection can be established 2. returns "ERROR": If the data format is correct, you need to check whether the CIPMUX= 0 (through the command "AT+CIPMUX?"). If the query result is 1, you send Command "AT+CIPMUX=0" to reset it to 0). The current state of the TCP/IP service (via "AT+CIPSTATUS" query). If the current status is TCPCONNECTING,



		<p>it needs to be executed “AT+CIPCLOSE” Closes the currently failed TCP connection.</p> <p>If it is other status, run the command “AT+CIPSHUT” to disconnect the currently failed PDP.</p> <p>3. returns "ALREADY CONNECT ":</p> <p>This indicates that a TCP connection or a UDP connection already exists. If you want to confirm the need to establish a new connection, you need to order “AT+CIPCLOSE” to close the current connection.</p>
AT+CIPSEND=36 ABCDEFGHIJKLMNOP QRSTUVWXYZ0123456 789	> OK	<p>Send a fixed length:</p> <p>Will send a length of 36 bytes to the server, indicating the length of the data to be sent this time.</p> <p>If it can be sent, the module will reply ">" and then send data of length length to the serial port.</p> <p>If n = length, is also the most common situation, the data can be sent to the network, the module will reply SEND OK (single connection).</p>
AT+CIPSEND ABCDEFGHIJKLMNOP QRSTUVWXYZ0123456 789 <Ctrl+Z>	> OK	<p>Non-fixed-length send:</p> <p>If it can be sent, the module will reply ">" and send the byte data to the serial port until it encounters <Ctrl + Z> (hexadecimal: 0x1A).</p>
AT+CIPCLOSE	CLOSE OK	Close socket connection.
AT+CIPSHUT	OK	Deactivate GPRS PDP Context.



3.2 Multiple Connections

Multiple connections can be used when multiple TCP/IP connections are required for your application.

After the implementation of the initial configuration, the multi-connection process is as follows:

AT cmd	Response	Command Description
AT	OK	
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBIM",1,1	OK	Connect to the network.
AT+CIPMUX=1	OK	Set to multiple connections.
AT+CIPSTART=0,"TCP", "58.246.1.50", "60000"	OK Or ERROR Or 0,ALREADY CONNECT Or 0,CONNECT FAIL Or 0,CONNECT OK	<p>In the 0 channel,Connect TCP server address "58.246.1.50:62009", The return is as follows: 1. returns "0,CONNECT OK": The syntax of the command is correct and the current status, TCP connection can be established 2. returns "ERROR": If the data format is correct, you need to check whether the CIPMUX= 1 (through the command "AT+CIPMUX?"). If the query result is 0, you send Command "AT+CIPMUX=1" to reset it to 1).</p> <p>The current state of the TCP/IP service (via "AT+CIPSTATUS" query). If the current status is TCPCONNECTING, it needs to be executed "AT+CIPCLOSE=0" Closes the currently failed TCP connection.</p> <p>If it is other status, run the command "AT+CIPSHUT" to disconnect the currently failed PDP.</p>



		3. returns "0,ALREADY CONNECT ": This indicates that a TCP connection or a UDP connection already exists. If you want to confirm the need to establish a new connection, you need to order "AT+CIPCLOSE=0" to close the current connection.
AT+CIPSEND=0,36 ABCDEFGHIJKLMNPO QRSTUVWXYZ0123456 789	> OK	Send a fixed length: Will send a length of 36 bytes to the server, indicating the length of the data to be sent this time. If it can be sent, the module will reply ">" and then send data of length length to the serial port. If n = length, is also the most common situation, the data can be sent to the network, the module will reply "0,SEND OK "(multi connections).
AT+CIPSEND=0 ABCDEFGHIJKLMNPO QRSTUVWXYZ0123456 789 <Ctrl+Z>	> OK	Non-fixed-length send: If it can be sent, the module will reply ">" and send the byte data to the serial port until it encounters <Ctrl+Z> (hexadecimal: 0x1A).
AT+CIPCLOSE=0	0,CLOSE OK	Close socket connection.
AT+CIPSHUT	OK	Deactivate GPRS PDP Context.



4 TCP/IP Transparent mode

If the application needs to send and receive data on the serial port directly exchanged on both sides: All data input from the serial port will be considered to send remote data.

4.1 Single Connection

AT cmd	Response	Command Description
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBIM",1,1	OK	Connect to the network.
AT+CIPMUX=0	OK	Set to single connection mode.
AT+CIPSTART="TCP", "58.246.1.50", "60000"	OK Or ERROR Or ALREADY CONNECT Or CONNECT FAIL Or CONNECT OK	Refer 3.1.
AT+CIPMODE	OK	Enter the single-link transparent mode
ABCDEFGHIJKLMN OPQRSTUVWXYZ0123456789		Send data.
+++	OK	Exit transparent mode.
AT+CIPMODE	OK	Re-Enter the single-link transparent mode.
AT+CIPCLOSE		Close socket connection.



	CLOSE OK	
AT+CIPSHUT	OK	Deactivate GPRS PDP Context.

4.2 Multiple Connections

AT cmd	Response	Command Description
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBI M",1,1	OK	Connect to the network.
AT+CIPMUX=1	OK	Set to multiple connections.
AT+CIPSTART=0,"TCP", "58.246.1.50", "60000"	OK Or ERROR Or 0,ALREADYCONNECT Or 0,CONNECT FAIL Or 0,CONNECT OK	Refer 3.2.
AT+CIPMODE = 0	OK	Enter multilink transparent mode.
ABCDEFGHIJKLMNO PQRSTUVWXYZ0123 456789		Send data
+++	OK	Exit transparent mode.
AT+CIPMODE = 0	OK	Re-enter multilink transparent mode.
AT+CIPCLOSE=0	CLOSE OK	Close socket connection.
AT+CIPSHUT	OK	Deactivate GPRS PDP Context.



5 HTTP/HTTPS

5.1 Set up the network environment

AT cmd	Response	Command Description
AT	OK	
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBIM",1,1	OK	Connect to the network.

5.2 HTTP Operation process

AT cmd	Response	Command Description
AT+HTTPPARA=URL,"www.baidu.com"	OK	Set the URL.
AT+HTTPPARA=PORT,80	OK	Set the PORT.
AT+HTTPSETUP	OK	Establish HTTP connection.
AT+HTTPACTION=0 //GET	OK	Request method.
AT+HTTPACTION=1 //HEAD		
AT+HTTPACTION=2 >FSDFS //POST----INPUT MODE		
AT+HTTPCLOSE	OK	Close HTTP connection.



5.3 HTTPS Operation process

AT cmd	Response	Command Description
AT+HTTPSPARA=URL," www.baidu.com"	OK	Set the URL.
AT+HTTPSPARA=PORT, 443	OK	Set the PORT.
AT+HTTPSSETUP	OK	Establish HTTPS connection.
AT+HTTPSACTION=0// GET AT+HTTPSACTION=1 //HEAD AT+HTTPSACTION=2 >FSDFS //POST----INPUT MODE	OK 响应 +HTTPSRECV: HTTP/1.1 200 Content-Type: application/json;char set=UTF-8 Transfer-Encoding: chunked Date: Fri, 06 Dec 2019 08:37:00 GMT Connection: close HTTPS LINK CLOSE!	Request method.
AT+HTTSPCLOSE	OK	Close HTTPS connection.



6 FTP

6.1 Set up the network environment

AT cmd	Response	Command Description
AT	OK	
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBIM",1,1	OK	Connect to the network.

6.2 FTP Download file

AT cmd	Response	Command Description
AT+FTPTYPE="I"	OK	"A" ASCII sessions "I" Binary sessions
AT+FTPMODE=1	OK	0 Active mode 1 Passive mode
AT+FTPREST=0	OK	Offset value to download the file.
AT+FTPSERV="182.150.28.206"	OK	Set the FTP server address.
AT+FTPPORT=2100	OK	Set the PORT number to 2100 and the default PORT number to 21.
AT+FTPUN= "cd_ftp"	OK	Set user name.
AT+FTPPW= "cd_ftp"	OK	Set password.
AT+FTPGETNAME="example.c"	OK	Set the downloaded file name.
AT+FTPGETPATH="/"	OK	Set the path of download file.
AT+FTPGET=1	+FTPGET: 1,40 OK	Start file download.



AT+FTPGET=2,<value>	+FTPGET: 2,15 <.....> OK	Get <Value> bytes of downloaded content.
AT+FTPRMD	OK	The removed folder is specified by the "AT+FTPGETPATH" command.
AT+FTPMKD	OK	The created folder is specified by the "AT+FTPGETPATH" command.
AT+FTPLIST	OK	The folder used to display the list is specified by the "AT+FTPGETPATH" command.
AT+FTPDELE	OK	The file to be deleted is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands.

6.3 FTP Upload file

AT cmd	Response	Command Description
AT+FTPTYPE="I"	OK	"A" ASCII sessions "I" Binary sessions
AT+FTPMODE=1	OK	0 Active mode 1 Passive mode
AT+FTPSERV="182.150.28.206"	OK	Set the FTP server address.
AT+FTPPORT=2100	OK	Set the PORT number to 2100 and the default PORT number to 21.
AT+FTPUN= "cd_ftp"	OK	Set user name.
AT+FTPPW="cd_ftp"	OK	Set password.
at+FTPPUTOPT="STOR"	OK	"APPE" Append file "STOU" Store unique files "STOR" Store files
AT+FTPPUTNAME="put filename"	OK	Set the uploaded file name.
AT+FTPPUTPATH="/"	OK	Set the path of upload file.
AT+FTPPUT=2,<value>	>..... +FTPPUT: 2,<value> OK	Will send a length of <value> bytes to the server, indicating the length of the data to be sent this time. If it can be sent, the module will reply ">"



		<p>and then send data of length length to the serial port.</p> <p>If n = length, is also the most common situation, the data can be sent to the network, the module will reply :</p> <p>+FTPPUT:2,<value></p> <p>OK</p>
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6.4 FTP Download file to FS

AT cmd	Response	Command Description
AT+FTPTYPE="I"	OK	"A" ASCII sessions "I" Binary sessions
AT+FTPMODE=1	OK	0 Active mode 1 Passive mode
AT+FTPSERV="182.150.28.206"	OK	Set the FTP server address.
AT+FTPPORT=2100	OK	Set the PORT number to 2100 and the default PORT number to 21.
AT+FTPUN= "cd_ftp"	OK	Set user name.
AT+FTPPW= "cd_ftp"	OK	Set password.
AT+FTPGETOFS="C:/","/" ,1,"s1111.txt"	+FTPGETTOFS: 1,20 OK	
AT+FTPGETOFS="C:/","/" ,2,"s1111.txt","s1112.txt"	+FTPGETTOFS: 1,20 +FTPGETTOFS: 2,20 OK	

Note: AT+FTPGETOFS=<destpath>,<soupath>,<num>,<filename1>,<filename2>....



7 FOTA

7.1 Set up the network environment

AT cmd	Response	Command Description
AT	OK	
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBIM",1,1	OK	Connect to the network.

7.2 FOTA Process

AT cmd	Response	Command Description
		Set up the network environment
AT+FOTACHECK	NEW VERSION OK Or OK	If there is an update package,return: NEW VERSION OK If there is no update package,return: OK
AT+FOTADLOAD	DOWNLOAD OK Or +CME ERROR: <errno>	download an update package
AT+FOTAUPDATE	OK	Make upgrade related settings and restart upgrade



		After the upgrade and Set up the network environment
AT+FOTAREPORT	OK	Inform the server that the upgrade was successful



8 TCP SERVER

8.1 Set up the network environment

AT cmd	Response	Command Description
AT	OK	
AT+CSTT="3GNET"	OK	Set APN name(user name and password optional).
AT+CIICR	OK	Activate GPRS PDP Context.
AT+CGDATA="M-MBIM",1,1	OK	Connect to the network.

8.2 TCP Server Operation process

AT cmd	Response	Command Description
		Set up the network environment
AT+CIPSERVER=1,TCP,5050	SERVER CREATE OK	Open tcp server and bind the port 5050
	+TCPSERVER,0,[127.0.0.1:33234] LISTEN OK	IP[127.0.0.1]PORT[33234] Connect to the server
	+TCPRECV 0,[127.0.0.1,33234],10: 1111111111	Received 10 bytes of data: 1111111111 From IP[127.0.0.1]PORT[33234]
AT+TCPSSEND=0,10 0123456789	> 0,SEND OK	Send data to client 0.
		IP[127.0.0.1]PORT[33234]



	+TCPCLOSED 0,[127.0.0.1,33234]	Disonnect to the server
AT+TCPCLOSE=0	0,CLOSE OK	Close client connection
AT+CIPSERVER=0	SERVER CLOSE OK	Close server ok.

8.3 UDP Server Operation process

AT cmd	Response	Command Description
		Set up the network environment
AT+CIPSERVER=1,UDP,5050	SERVER CREATE OK	Open udp server and bind the port 5050
	+UDPRECV 0,[127.0.0.1,33234],10: 1111111111	Received 10 bytes of data: 1111111111 From IP[127.0.0.1]PORT[33234]
AT+TCPCSEND=0,10 0123456789	> 0,SEND OK	Send data to client 0.
AT+TCPCLOSE=0	0,CLOSE OK	Clean client info
AT+CIPSERVER=0	SERVER CLOSE OK	Close server ok.