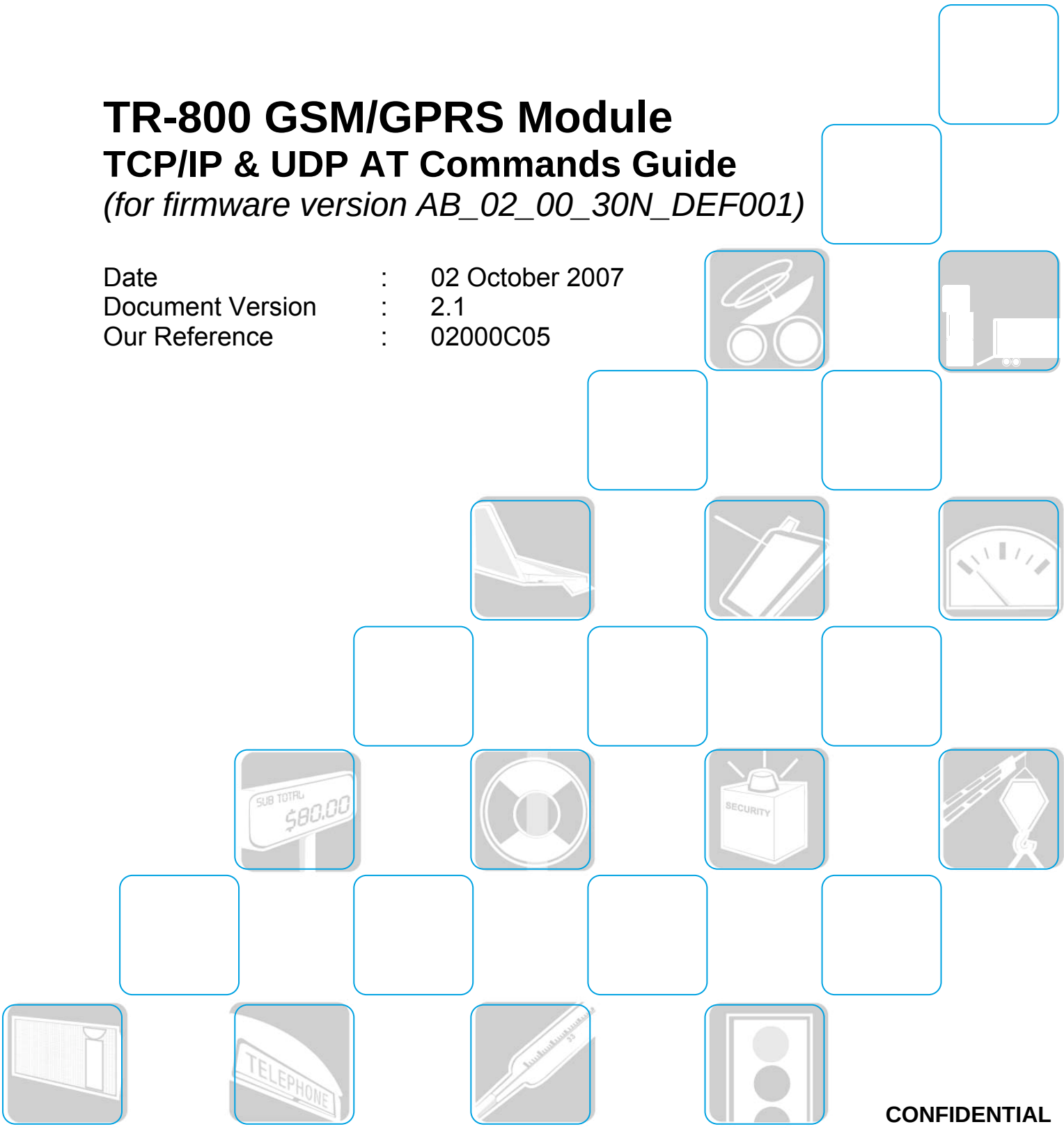
inspiring the
World Of Wireless…

TR-800 GSM/GPRS Module

TCP/IP & UDP AT Commands Guide

(for firmware version AB_02_00_30N_DEF001)

Date	:	02 October 2007
Document Version	:	2.1
Our Reference	:	02000C05



CONFIDENTIAL

Document Information

Version	Date	Document History	Associated Firmware Version
0.10	7 Sept 2005	▪ Initial document	AMB_02_00_20T_00 and later
0.11	12 Sept 2005	▪ Minor revisions, open-close quotes to certain commands were added	AMB_02_00_20T_00 and later
0.12	21 Sept 2005	▪ CME Error codes were added	AMB_02_00_20T_00 and later
0.13	15 Nov 2005	▪ AT Commands were updated	AB_02_00_22T_DEF001 and later
1.0	23 Feb 2006	▪ AT-Command were updated, including Data Mode TCP/IP communication ▪ Introduction to TCP/IP AT-Commands were added	AB_02_00_25N_DEF001 and later
1.1	15 Aug 2006	▪ New AT-commands added: AT$SENDMODE, AT$DLEMODE, AT$TCPSEND, +++ and ATO ▪ Implemented online and offline toggling feature with '+++' and 'ATO' ▪ Amended Usage examples ▪ Updated CME Error Codes	AB_02_00_28N_DEF001
2.0	23 Feb 2007	▪ Added UDP functions o $UDPSRV o $UDPPORT o $LSTUDP o $UDPOPEN o $UDPCLOSE o $UDPLPORT	AB_02_00_28N_DEF001
2.1	02 Oct 2007	▪ Additional parameter to set AT$TCPOPEN ▪ Edited explanation of AT$DLEMODE ▪ Added Socket Settings Section for common TCPIP and UDP commands ▪ Added Section on Savable Commands using AT&W ▪ Added section on TCP/UDP display messages	AB_02_00_30N_DEF001

For enquiries, please contact:

iWOW Connections Pte Ltd
1 Lorong 2 Toa Payoh #04-01
Yellow Pages Building
Singapore 319637
Office: (65) 6748 8123
Fax : (65) 6748 2668
http://www.iwow.com.sg

GENERAL NOTE

The aim of this document is to support the application and engineering efforts of iWOW customers that use iWOW's products. This document is intended for testing, evaluation, integration, and information purposes.

iWOW makes every effort to ensure that the quality of the information is available. The content of this documentation is provided on an "as is" basis and may contain deficiencies or inadequacies.

iWOW disclaims any warranty and all responsibility for the application of the device(s) that is made in relation to the accuracy, reliability or contents of this document. iWOW is not liable for any injury, loss or damage of any kind incurred for the use of or reliance upon information.

iWOW reserves the right to make any modifications, additions and deletions to this document due to typographical errors, inaccurate information, or improvements to products at any time and without notice.

Contents

1. INTRODUCTION

This document presents iWOW's AT-commands dedicated to IP connectivity implemented in the TR-800 GSM/GPRS module.

The commands shown in this document applies to firmware revision **AB_02_00_30N_DEF001**.

2. GPRS DIALING SERVICE

2.1. APN server: $APNSRV

Description: This parameter is provided by the GSM operator for access to GPRS.

- Setting/Getting:

Set value: AT$APNSRV = "<value>"
Get value: AT$APNSRV? or AT$LSTGPRS

- Legal values:

Alphanumeric ASCII text string up to 20 characters

- Default value:

There is no default value for this parameter.

Command Syntax:

Command	Possible response(s)
AT$APNSRV="sunsurf"	OK
AT$APNSRV?	$APNSRV: "sunsurf" OK
AT$APNSRV?	$APNSRV: "" OK

2.2. APN username: $APNUSR

Description: This parameter is provided by the GSM operator for access to GPRS.

- Setting/Getting:

Set value: AT$APNUSR = "<value>"
Get value: AT$APNUSR? or AT$LSTGPRS

- Legal values:

Alphanumeric ASCII text string up to 20 characters

▪ Default value:
There is no default value for this parameter.

Command Syntax:

Command	Possible response(s)
AT$APNUSR=”user”	OK
AT$APNUSR?	$APNUSR: “user” OK
AT$APNUSR?	$APNUSR: “” OK

2.3. APN password: $APNPASS

Description: This parameter is provided by the GSM operator for access to GPRS.

▪ Setting/Getting:
Set value: AT$APNPASS = “<value>”
Get value: AT$APNPASS? or AT$LSTGPRS

▪ Legal values:
Alphanumeric ASCII text string up to 20 characters

▪ Default value:
There is no default value for this parameter.

Command Syntax:

Command	Possible response(s)
AT$APNPASS=”password”	OK
AT$APNPASS?	$APNPASS: “password” OK
AT$APNPASS?	$APNPASS: “” OK

2.4. GPRS CID: $GPRSCID

Description: This command is used to specify active PDP context.

- Setting/Getting:

Set value: AT$GPRSCID = <value>
Get value: AT$GPRSCID? or AT$LSTGPRS

- Legal values:

Numeric value 1 or 2.

- Default value: 1

Command Syntax:

Command	Possible response(s)
AT$GPRSCID=1	OK
AT$GPRSCID?	$GPRSCID: 1 OK

2.5. Listing GPRS parameters: $LSTGPRS

Description: This command directs the TCP/IP to display all the AT$ parameters related to the GPRS connection configuration.

Command Syntax:

Command	Possible response(s)
AT$LSTGPRS	$APNSRV: “sunsurf” $APNUSR: “user123” $APNPASS: “pass123” $GPRSCID: 1 OK
AT$LSTGPRS	$APNSRV: “” $APNUSR: “” $APNPASS: “” $GPRSCID: 1 OK

List of parameters:
APNSRV
APNUSR
APNPASS
GPRSCID

3. GSM DIALING SERVICES

3.1. Dialing number: $DIALNUM

Description: ISP provided dial-up phone number that is used to connect with local ISP. Length depends on country.

- Setting/Getting:

Set value: AT$DIALNUM = “<value>”
Get value: AT$DIALNUM?

- Legal values:

Decimal phone numbers

- Default value:

There is no default value for this parameter.

Command Syntax:

Command	Possible response(s)
AT$DIALNUM=”96162531”	OK
AT$DIALNUM?	$DIALNUM: ”96162531” OK
AT$DIALNUM?	$DIALNUM: ”” OK

3.2. Username: $ISPUSR

Description: ISP account username that must be provided to ISP upon successful establishment of the physical layer.

- Setting/Getting

Set value: AT$ISPUSR = “<value>”
Get value: AT$ISPUSR?

- Legal values

Alphanumeric ASCII text string up to 64 characters.

- Default value

There is no default value for this parameter.

Command Syntax

Command	Possible response(s)
AT$ISPUSR=”username”	OK
AT$ISPUSR?	$ISPUSR: ” username” OK

AT$ISPUSR?	$ISPUSR: "" OK

3.3. Password: $ISPPASS

Description: ISP account password that must be provided to ISP upon successful establishment of the physical layer.

- Setting/Getting:

Set value: AT$ISPPASS = "<value>"
Get value: AT$ISPPASS?

- Legal values:

Alphanumeric ASCII text string up to 64 characters.

- Default value:

There is no default value for this parameter.

Command Syntax:

Command	Possible response(s)
AT$ISPPASS="password"	OK
AT$ISPPASS?	$ISPPASS: " password" OK
AT$ISPPASS?	$ISPPASS: "" OK

3.4. Listing GSM dial-up parameters: $LSTPPP

Description: This command directs the TCP/IP to display all the AT$ parameters related to the PPP connection configuration.

Command Syntax

Command	Possible response(s)
AT$LSTPPP	$DIALNUM: "1234567" $PPPUSR: "user123" $PPPPASS: "pass123" OK
AT$LSTPPP	$DIALNUM: "" $PPPUSR: "" $PPPPASS: "" OK

List of parameters:
DIALNUM
PPPUSR
PPPPASS

4. CONNECTION SERVICES

4.1. Connection Mode: $BEARER

Description: This command is used to choose active connection mode (GSM or GPRS).

- Setting/Getting:

Set value: AT$BEARER= <value>
Get value: AT$BEARER? or AT$LSTGPRS

- Legal values:
  0: GSM
  1: GPRS

- Default value: 1

Command Syntax:

Command	Possible response(s)
AT$BEARER=1	OK
AT$BEARER?	$BEARER: 1 OK

4.2. Starting a bearer: $CONNSTART

Description: This command is used to dial out and establish connection to the Internet using context defined by $BEARER.

Upon receiving this instruction, the TCP/IP stack initiates a complete session according to the following:

- In GSM mode, the TCP/IP stack will establish a GSM data connection with DIALNUM, PPPUSR, and PPPPASS parameters.
- In GPRS mode, the TCP/IP stack will establish a GPRS session using APNUSR, APNPASS, and GPRSCID parameters. Successful GPRS link indicates that the device is connected to the Internet. The AT$CONNSTOP command closes the connection.

Command Syntax:

Command	Possible response(s)
AT$CONNSTART Note: Connect	Ok_Info_GprsActivation EXT: 0 OK

4.3. Ending a bearer connection: $CONNSTOP

Description: This command directs the TCP/IP stack to end a GPRS or GSM connection previously established with the $CONNSTART command.

Command Syntax:

Command	Possible response(s)
AT$CONNSTOP *Note: Disconnect*	Ok_Info_GprsDeactivation EXT: 0 OK *Note: Phone line is released*.

5. TCP/IP CONFIGURATION

5.1. Configuring data-mode or command-mode data transfer: $SENDMODE

Description: This command is used to define what mode (data-mode or command-mode) to employ when sending/receiving data through a TCP/UDP socket.

- Setting/Getting:

Set value: AT$SENDMODE = <mode>
Get value: AT$SENDMODE?

- Legal values:
  0: Mode 0, Using command-mode for data sending and receiving.
  1: Mode 1, Using data-mode for data sending and receiving.

- Default value:

Mode=1

Command Syntax:

Command	Possible response(s)
AT$SENDMODE?	$SENDMODE: 1 OK
AT$SENDMODE=0 *Note: Enable command-mode data sending/receiving*	OK

Note: This command is not allowed when TCP/UDP socket is established.

5.2. Data Link Escape mode: $DLEMODE

Description: This command is used by the user to decide whether to code the ETX (End of Text) character when opening a TCP/UDP socket.

- Setting/Getting:

Set value: AT$DLEMODE = <mode>
Get value: AT$DLEMODE?

- Legal values:
  0: Mode 0, When DLEMODE is set to 0, no specific process is needed on ETX characters. It means that it is not possible for a host to request an end of connection or to receive a clear indication of end of connection from the TCPIP or UDP stack.
  1: Mode 1, When DLEMODE is set to 1, the ETX character means a request/indication/end of connection. The ETX characters belonging to payload data have to be sent by the host on the serial port preceded by a DLE character. This is similar to ETX characters received by the IP.

- Default value:

Mode=1

Command Syntax:

Command	Possible response(s)
AT$DLEMODE?	$DLEMODE: 1 OK
AT$DLEMODE=0	OK

5.3. Toggling between online and offline mode during data mode: +++/ATO

Description: These commands allow the user to switch between online and offline mode during a data connection. To switch from online mode to offline mode, the '+++' sequence must be sent after which the module goes to offline mode with an 'OK' response and AT-commands can be entered. To switch from offline mode to online mode, 'ATO' must be sent after which a 'CONNECT' response is observed.

Command Syntax:

Command	Possible response(s)
+++ *Note: During a data connection*	OK *Note: AT-command can be entered.*
ATO	CONNECT *Note: Data connection reestablished.*

6. TCP SOCKET SERVICES

6.1. Setting a TCP server: $TCPSRV

Description: This command is used to define the IP address of the remote TCP server (or host) when using a TCP connection.

- Setting/Getting:

Set value: AT$TCPSRV = <mode>, “<value>”
Get value: AT$TCPSRV?

- Legal values:
  0: Mode 0, the value is a 32-bit number in dotted-decimal notation (i.e. xxx.xxx.xxx.xxx)
  1: Mode 1, the alphanumeric ASCII text string up to 120 characters

- Default value:

There is no default value for this parameter.

Command Syntax:

Command	Possible response(s)
AT$TCPSRV?	$TCPSRV: “0.0.0.0” OK
AT$TCPSRV=0,”111.222.111.222”	OK
AT$TCPSRV?	$TCPSRV: “111.222.111.222” OK

Note: The command would use the latest server IP/name entered despite the mode used. This means that it is possible to set a server name different from the server IP you entered, but the TCP/IP stack would always use the last setting entered. $LSTTCP can be used to check settings.

6.2. Setting a TCP port: $TCPPORT

Description: This command is used to define the port number of the remote TCP server (or host) when using a TCP connection.

- Setting/Getting:

Set value: AT$TCPPORT = <value>
Get value: AT$TCPPORT? Or AT$LSTTCP

- Legal values:

Numbers 0 to 65535.

- Default value: 0

Command Syntax:

Command	Possible response(s)
AT$TCPPORT?	$TCPPORT: 0 OK
AT$TCPPORT=1111	OK
AT$TCPPORT?	$TCPPORT: 1111 OK

6.3. Listing TCP parameters: $LSTTCP

Description: This command directs the TCP/IP to display all the AT$ parameters related to the TCP socket configuration.

Command Syntax:

Command	Possible response(s)
AT$LSTTCP	$DLEMODE: 1 $TCPSRV: “123.145.123.124” $TCPPORT: 5013 OK
AT$LSTTCP	$DLEMODE: 1 $TCPSRV: “” $TCPPORT: 0 OK

List of parameters:
TCPSRV
TCPPORT

6.4. Opening a TCP connection: $TCPOPEN

Description: This local command directs the TCP/IP stack to open a TCP connection to the specified TCP server. Once the physical link (using $CONNSTART) is established, the attached host can open a TCP connection at any time (except when the TCP/IP stack software is already in the process using TCP/IP resources).

Depending on the mode (AT$SENDMODE) selected for the data transfer, this command gives different responses.

- For command-mode (AT$SENDMODE=0) sending, after this command is issued, AT$TCPSEND (refer to Section 7.5) is used to send the data and any data received is shown as unsolicited responses.

- For data-mode (AT$SENDMODE=1) sending, after this command is issued, the TCP socket is opened and data can be sent directly over the link. All 8-bit ASCII characters are accepted. The TCP/IP socket may be closed using the ETX character (^C) (Refer to Section 6.2: AT$DLEMODE).

- Setting/Getting:

Set value: AT$TCPOPEN = [<timeout>]

Command Syntax:

Command	**Possible response(s)**
AT$TCPOPEN *Note: Request opening of TCP socket for command-mode sending.*	OK
AT$TCPOPEN *Note: Request opening of TCP socket for data-mode sending.*	Ok_InfoWaitingForData EXT: 0 *Note: This message signals that the TCP socket has been opened.*
AT$TCPOPEN=5 *Note: Set TCPIP connection time-out value to 5 seconds*	OK *Note: The TCP socket has been opened in command-mode sending*

Defined Values:

<timeout>

5-120 Optional. Connection Time-out value (in seconds)

Note: If <timeout> is not specified, the connection time-out will be dependent on the network

6.5. Sending/Receiving data using command-mode: $TCPSEND

Description: This local command directs the TCP/IP stack to send data to the TCP server specified by $TCPSRV and $TCPPORT.

Once the TCP connection is opened, the attached host can send data at any time (except when the TCP/IP stack software is already in the process using TCP/IP resources).
One command is able to send 255 characters.
All 7-bit ASCII characters are accepted, all other characters e.g. ';' and '\' can be sent using the following format "\XX" where "XX" is their ASCII hex code

Command Syntax:

Command	**Possible response(s)**
AT$TCPSEND=”<data>” *Note: Can send up to 255 bytes.*	OK

6.6. Closing a TCP connection: $TCPCLOSE

Description: This local command directs the TCP/P stack to close a TCP connection. This command can only be performed in command-mode to close the TCP socket.

Command Syntax:

Command	**Possible response(s)**
AT$TCPCLOSE *Note: Request closing of TCP/ IP socket in command-mode*	Ok_Info_DataClosed EXT: O OK

7. UDP SOCKET SERVICES

7.1. Setting a UDP server: $UDPSRV

Description: This command is used to define the IP address of the remote UDP server (or host). If UDP is connected in listening mode, this setting is not used.

- Setting/Getting:

Set value: AT$UDPSRV = <mode>, "<value>"
Get value: AT$UDPSRV?

- Legal values:

0: Mode 0, the value is a 32-bit number in dotted-decimal notation (i.e. xxx.xxx.xxx.xxx)
1: Mode 1, the alphanumeric ASCII text string up to 120 characters

- Default value:

There is no default value for this parameter.

Command Syntax:

Command	Possible response(s)
AT$UDPSRV?	$UDPSRV: "0.0.0.0" OK
AT$UDPSRV=0,"111.222.111.222"	OK
AT$UDPSRV?	$UDPSRV: "111.222.111.222" OK

Note: The command would use the latest server IP/name entered despite the mode used. This means that it is possible to set a server name different from the server IP you entered, but the IP stack would always use the last setting entered. $LSTUDP can be used to check settings.

7.2. Setting a UDP port: $UDPPORT

Description: This command is used to define the port number of the remote UDP server (or host) when using a UDP connection. The port number set is used in UDP sending mode.

- Setting/Getting:

Set value: AT$UDPPORT = <value>
Get value: AT$UDPPORT?
Legal values:
Numbers 0 to 65535.

- Default value: 0

Command Syntax:

Command	Possible response(s)
AT$UDPPORT?	$UDPPORT: 0 OK
AT$UDPPORT=1111	OK
AT$UDPPORT?	$UDPPORT: 1111 OK

7.3. Setting a UDP listening port: $UDPLPORT

Description: This command is used to define the port number of UDP server (or host) when using a UDP connection. The port number set is used in UDP listening mode.

- Setting/Getting:

Set value: AT$UDPLPORT = <value>
Get value: AT$UDPLPORT?

- Legal values:

Numbers 0 to 65535.

- Default value: 0

Command Syntax:

Command	Possible response(s)
AT$UDPLPORT?	$UDPLPORT: 0 OK
AT$UDPLPORT=2222	OK
AT$UDPLPORT?	$UDPLPORT: 2222 OK

7.4. Listing UDP parameters: $LSTUDP

Description: This command directs the UDP to display all the AT$ parameters related to the UDP socket configuration.

Command Syntax:

Command	Possible response(s)
AT$LSTUDP	$DLEMODE: 1 $UDPSRV: “123.145.123.124” $UDPPORT:1111 $UDPLPORT: 2222 OK

AT$LSTUDP	$DLEMODE: 1 $UDPSRV: “” $UDPPORT: 0 $UDPLPORT: 0 OK

List of parameters:
UDPSRV
UDPPORT
UDPLPORT

7.5. Opening a UDP connection: $UDPOPEN

Description: This local command directs the IP stack to open a UDP connection. Once the physical link (using $CONNSTART) is established, the attached host can open a UDP connection at any time (except when the IP stack software is already in the process using IP resources).

Depending on the mode (AT$SENDMODE) selected for the data transfer, this command gives different responses.

- For command-mode (AT$SENDMODE=0) sending, after this command is issued, AT$UDPSEND (refer to Section 8.6) is used to send the data and any data received is shown as unsolicited responses.

- For data-mode (AT$SENDMODE=1) sending, after this command is issued, the UDP is opened and data can be sent directly over the link. All 8-bit ASCII characters are accepted. The IP socket may be closed using the ETX character (^C) (Refer to Section 6.2: AT$DLEMODE).

Command Syntax:

Command	**Possible response(s)**
AT$UDPOPEN *Note: Request opening of UDP for command-mode sending.*	OK
AT$UDPOPEN *Note: Request opening of UDP for data-mode sending.*	Ok_InfoWaitingForData EXT: 0 *Note: This message signals that the UDP has been opened.*

7.6. Sending/Receiving data using command-mode: $UDPSEND

Description: This local command directs the IP stack to send data to the UDP server specified by $UDPSRV and $UDPPORT.

Once the UDP connection is opened, the attached host can send data at any time (except when the IP stack software is already in the process using IP resources).
One command is able to send 255 characters.

All 7-bit ASCII characters are accepted, all other characters e.g. ';' and '\' can be sent using the following format "\XX" where "XX" is their ASCII hex code

Command Syntax:

Command	Possible response(s)
AT$UDPSEND=”<data>” *Note: Can send up to 255 bytes.*	OK

7.7. Closing a UDP connection: $UDPCLOSE

Description: This local command directs the IP stack to close a UDP connection. This command can only be performed in command-mode to close the IP socket.

Command Syntax:

Command	Possible response(s)
AT$UDPCLOSE *Note: Request closing of UDP socket in command-mode*	Ok_Info_DataClosed EXT: O OK

8. USAGE EXAMPLE

8.1. TCP Connection via GPRS for command-mode

This example illustrates how user sends data over a TCP connection using the TCP/IP stack for command-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port. After the TCP connection has been successfully opened, a string “hello world” is sent to the server. The server echoes the string back and “hello world” will be displayed on the AT command line. A TCP connection close command will be executed followed by a GPRS connection close command.

Command	Possible response(s)	Explanation
AT$APNSRV=”sunsurf”	OK	Set the correct APN server
AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings
AT$TCPSRV=0,”203.127.161.123”	OK	Set the TCP server using IP address (dotted quad format)
AT$TCPPORT=5062	OK	Set the TCP port
AT$SENDMODE=0	OK	Select command-mode for data transfer
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$TCPOPEN	Ok_Info_WaitingForData EXT: O OK	Open connection to TCP server. Connection successful
AT$TCPSEND=”hello world”	OK $RECV: “hello world”	Sends “hello world” to TCP echo server. Receives echo of “hello world” back.
AT$TCPCLOSE	Ok_Info_DataClosed EXT: O OK	Closes TCP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

8.2. TCP Connection via GPRS for data-mode

This example illustrates how user sends data over a TCP connection using the TCP/IP stack for data-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port. After the TCP connection has been successfully opened, data sent to server will be echo back and is displayed.

This example also shows how '+++' and 'ATO' are used to switch between online and offline modes. To close TCP connection, a close command will be executed followed by a GPRS connection close command.

Command	Possible response(s)	Explanation
AT$APNSRV=”sunsurf”	OK	Set the correct APN server
AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings
AT$TCPSRV=0,”203.127.161.123”	OK	Set the TCP server using IP address (dotted quad format)
AT$TCPPORT=5062	OK	Set the TCP port
AT$SENDMODE=1	OK	Select data-mode for data transfer.
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$TCPOPEN	Ok_Info_WaitingForData EXT: O	Open connection to TCP server. Connection successful. Data can be sent by keying in.
+++	OK	Exit online mode to offline mode.
AT+COPS?	+COPS: 0,0,"SGP-M1-3GSM"	AT-commands can be entered now.
ATO	CONNECT	Exit offline mode back to online mode. Data can be sent by keying in.
^C	Ok_Info_DataClosed EXT: O OK	Close TCP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

8.3. UDP Connection via GPRS for command-mode

This example illustrates how user sends data over a UDP connection using the IP stack for command-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port/listening port. After the UDP connection has been successfully opened, a string “hello world” is sent to the server. The server echoes the string back and “hello world” will be displayed on the AT command line. A UDP connection close command will be executed followed by a GPRS connection close command.

Command	Possible response(s)	Explanation
AT$APNSRV=”sunsurf”	OK	Set the correct APN server
AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings
AT$UDPSRV=0,”203.127.161.123”	OK	Set the UDP server using IP address (dotted quad format)
AT$UDPPORT=5062	OK	Set the UDP port
AT$UDPLPORT=5062	OK	Set the UDP Listening port
AT$SENDMODE=0	OK	Select command-mode for data transfer
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$UDPOPEN	Ok_Info_WaitingForData EXT: O OK	Open connection to UDP server. Connection successful
AT$UDPSEND=”hello world”	OK $RECV: “hello world”	Sends “hello world” to UDP echo server. Receives echo of “hello world” back.
AT$UDPCLOSE	Ok_Info_DataClosed EXT: O OK	Closes UDP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

8.4. UDP Connection via GPRS for data-mode

This example illustrates how user sends data over a UDP connection using the IP stack for data-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port/listening port. After the UDP connection has been successfully opened, data sent to server will be echo back and is displayed.

This example also shows how '+++' and 'ATO' are used to switch between online and offline modes. To close UDP connection, a close command will be executed followed by a GPRS connection close command.

Command	Possible response(s)	Explanation
AT$APNSRV=”sunsurf”	OK	Set the correct APN server
AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings
AT$UDPSRV=0,”203.127.161.123”	OK	Set the UDP server using IP address (dotted quad format)
AT$UDPPORT=5062	OK	Set the UDP port
AT$UDPLPORT=5062	OK	Set the UDP Listening port
AT$SENDMODE=1	OK	Select data-mode for data transfer
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$UDPOPEN	Ok_Info_WaitingForData EXT: O	Open connection to TCP server. Connection successful. Data can be sent by keying in.
+++	OK	Exit online mode to offline mode.
AT+COPS?	+COPS: 0,0,"SGP-M1-3GSM"	AT-commands can be entered now.
ATO	CONNECT	Exit offline mode back to online mode. Data can be sent by keying in.
^C	Ok_Info_DataClosed EXT: O OK	Close UDP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

9. COMMANDS AFFECTED BY AT&W AND AT&F

9.1. GPRS Dialing Services

AT-Command	AT&W	AT&F	Default Values
$APNSRV	X	X	
$APNUSR	X	X	
$APNPASS	X	X	

9.2. TCP/IP Configuration

AT-Command	AT&W	AT&F	Default Values
$SENDMODE	X	X	1

9.3. TCP Socket Services

AT-Command	AT&W	AT&F	Default Values
$TCPSRV	X	X	0.0.0.0
$TCPPORT	X	X	0

9.4. UDP Socket Services

AT-Command	AT&W	AT&F	Default Values
$UDPSRV	X		0.0.0.0
$UDPPORT	X	X	0
$UDPLPORT	X	X	0

10. APPENDIX

10.1. CME Error Codes

The error codes and descriptions are listed in the following table:

ERROR	Description
3000	An asynchronous error network event has occurred
3001	A parameter given to the function is invalid
3002	An internal error has happened
3003	The address or port is already in use
3004	There is not enough memory to fulfill the request
3005	The socket is not of a type that can support this operation
3006	The specified host cannot be reached
3007	The connection to the specified address was refused by the remote host
3008	The request could not be fulfilled because the socket is already connected
3009	The connection attempt timed out without establishing a connection
3010	The specified host could not be found in the DNS
3011	A temporary DNS error has occurred. Retrying the query may be successful
3012	A permanent DNS error has occurred
3013	The specified name has been found in the DNS, but no IP address is available
3014	The size of the data buffer is too large for a UDP socket
3015	The connection has been reset by the remote peer
3016	The connection was aborted due to timeout or some other error condition
3017	Sending failed temporarily because the space to buffer the message was exhausted.
3018	The operation failed because TCP/IP's bearer connection has been disconnected
3019	The operation failed because the bearer connection has not been opened.
3020	The bearer connection could not be opened because the mobile is not yet completely attached to the network. A retry at a later time may be successful.
3021	The operation failed because a similar operation is already in progress.
3022	The operation failed because a bearer connection is already open.
3023	Mobile equipment is not ready for TCP/IP connectivity
3024	Bearer is not open
3025	Connection is not open yet
3026	Bearer open fail
3027	Socket create fail
3028	Operation not allowed

10.2. TCP display messages

Display Message	Description
Ok_Info_GprsActivation	GPRS bearer context is activated - ready to be used by socket connection
Ok_Info_GprsDeactivation	GPRS bearer context is de-activated
Ok_Info_WaitingForData	Socket connected - ready for data transmission
Ok_Info_DataClosed	Socket disconnected & destroyed - bearer context still active
Error_Info_GprsActivation	Failed to activate GPRS bearer context
Error_Info_GsmActivation	Failed to activate GSM bearer context
Error_Info_SockCreateFail	Socket creation failed
Error_Info_InvalidParameter	Invalid parameter in TCP or UDP settings (some settings are not set)
Error_Info_AddressInUse	The address or port is already in use
Error_Info_OutOfMemory	There is not enough memory to fulfill the request
Error_Info_NotSupported	The socket is not of a type that can support this operation
Error_Info_Unreachable	The specified host cannot be reached
Error_Info_ConnRefused	The connection to the specified address was refused by the remote host
Error_Info_ConnTimeout	The connection attempt timed out without establishing a connection
Error_Info_AlreadyConnected	The request could not be fulfilled because the socket is already connected
Error_Info_HostNotFound	The specified host could not be found in the DNS
Error_Info_TempDNSError	A temporary DNS error has occurred. Retrying the query may be successful
Error_Info_PermDNSError	A permanent DNS error has occurred
Error_Info_NoIPAddress	The specified name has been found in the DNS, but no IP address is available
Error_Info_MsgTooBig	The size of the data buffer is too large for a TCP or UDP socket
Error_Info_ConnReset	The connection has been reset by the remote peer
Error_Info_ConnAborted	The connection was aborted due to timeout or some other error condition
Error_Info_NoBufSpace	Sending failed temporarily because the space to buffer the message was exhausted
Error_Info_NetworkLost	The operation failed because TCP/IP and UDP bearer connection has been disconnected. As an asynchronous event code: The bearer connection has been closed.
Error_Info_InProgress	The operation failed because a similar operation is already in progress
Error_Info_AsyncError	Network event: an asynchronous error has occurred
Ok_Info_GsmActivation	GSM bearer context is activated
Ok_Info_GsmDeactivation	GSM bearer context is de-activated
Error_Info_OperNotAllowed	Current command is not allowed (eg: $SENDMODE cannot be changed during a connected TCP session. Need to close TCP first)

11. SUPPORT

- For direct clients: contact iWOW FAE (Technical Support Department)
- For distributor clients: contact iWOW distributor FAE
- For distributors: contact iWOW FAE

- End of document -