

PAD OPERATION



Model	Chameleon CTM-130/132 modem
Revision:	1849.0046#10 revision 1.0

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1 1 Contents

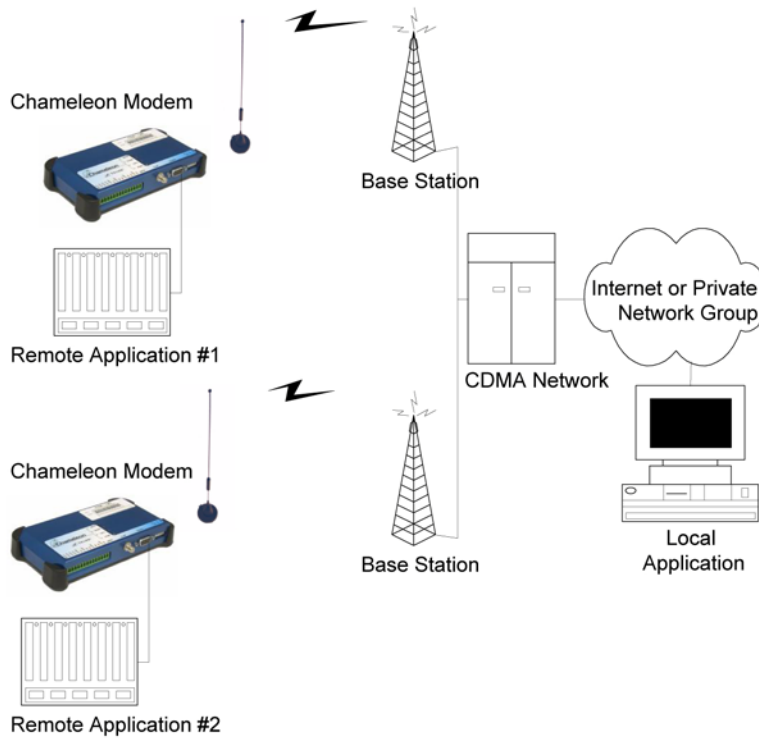
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2 Revision Control

Description	Revision	Date
Customer Release	1849.0046#10 revision 1.0	30-May-2005

3 CTM-130/132 PAD Operation

Packet Assembly and Disassembly (PAD) is used for sending and receiving “raw” data over IP networks. The modem takes care of establishing IP network connections, as well as the encapsulation of data within UDP or TCP packets. This eliminates the need for a TCP/IP stack running on the host device. This application note details how to setup the CTM-130 or CTM-132 CDMA wireless data modem in PAD mode in order to provide a communications link between an end device and a central control application. A PAD connection uses the CDMA 2000 1x packet data network so is able to provide the advantages of higher data rates, and being always connected so available for quicker response times. PAD mode is typically used for proprietary communication protocols such as the Allen Bradley DF1 or for direct communications with field devices normally operated on a dial-up modem connection.



3.1 Selecting the appropriate PAD settings:

There are two main PAD modes: UDP PAD or TCP PAD.

UDP transport protocol is connectionless and does not guarantee data delivery. However, it is much lighter than TCP in terms of data transmitted. It is considered suitable for the following applications: When total data transfer must be kept to a minimum. Losing a packet is not critical, or the application communication protocol itself provides for retransmissions.

TCP transport protocol is connection oriented and does guarantee data delivery. It will keep trying to send a packet multiple times until its delivery is acknowledged. Because of these characteristics, it has much more overhead compared to UDP. It is suitable for the following applications: When the total amount of data transfer is not critical. Losing a packet is critical and the application communication protocol itself does not perform retransmissions.

Both UDP PAD and TCP PAD can operate in either client or server mode. Client mode means that the modem is required to establish a connection to a remote device in server mode (this may be through another modem). Server mode means that the modem is continually listening on a port and will accept connections from a remote server (this may be from another modem).

return). If your protocol always ends a “sentence” with the same character then it can be set here. If no forwarding character is required set this to blank.

AT^PADFWDL=n

This is the PAD forwarding length. It defines how many ASCII characters will initiate the encapsulation and transmission process. Generally this parameter is set to a value greater than the longest “sentence” in your protocol. If no forwarding length is required set this to maximum (1000).

AT^PADFWDT=n

This is the PAD forwarding time in tenths of a second. It defines the time after receiving the last character in a “sentence” that the encapsulation and transmission process will be initiated. If every character is required to be sent immediately then set n=0.

AT^PADECHO=n

If the connected device requires every character it sends to the modem to be echoed back then set n=1, otherwise set n=0 to disable the echo feature.

AT^PADSVCT=n

This parameter sets the server connect time in seconds. If the modem is configured as a client this allows it to revert to server mode in order to receive incoming connections from another client. If the modem is required to be always in UDP client mode then set n=0 to disable the timer.

AT&W S

Save the current settings to non-volatile memory. The modem will now always power up in auto connect, PAD mode with the settings as configured above.

Power cycle the modem

This will initiate the PAD connect for AT^MODE=3.

4.1 To initiate a PAD connection from the modem:

If the modem has been configured in MODE 3 (auto connect network and PAD) then no other action is required to initiate the connection.

If the modem has been configured in MODE 1 (manual connect) or MODE 2 (auto connect to network) then it will be necessary to initiate the PAD connection using an AT command.

ATDT

Use this if AT^PADADR and AT^PADPORT have been previously configured. If AT^PADADR has been configured with 0.0.0.0 then the modem will connect in server mode and listen on the port defined by AT^PADPORT. If AT^PADADR has been configured with a non-zero IP address then the modem will connect to that

IP address in client mode and transmit to the port defined by AT^PADPORT.

ATDTn.n.n.n:p

Use this if AT^PADADR and AT^PADPORT have not been previously configured or you wish to over-ride the current configuration. The modem will connect in client mode where n.n.n.n is the IP address, and p is the listening port, of the remote modem.

Note that it is the client end that has to initiate the connection – the server is simply waiting to accept an incoming connection.

4.2 To close a PAD connection:

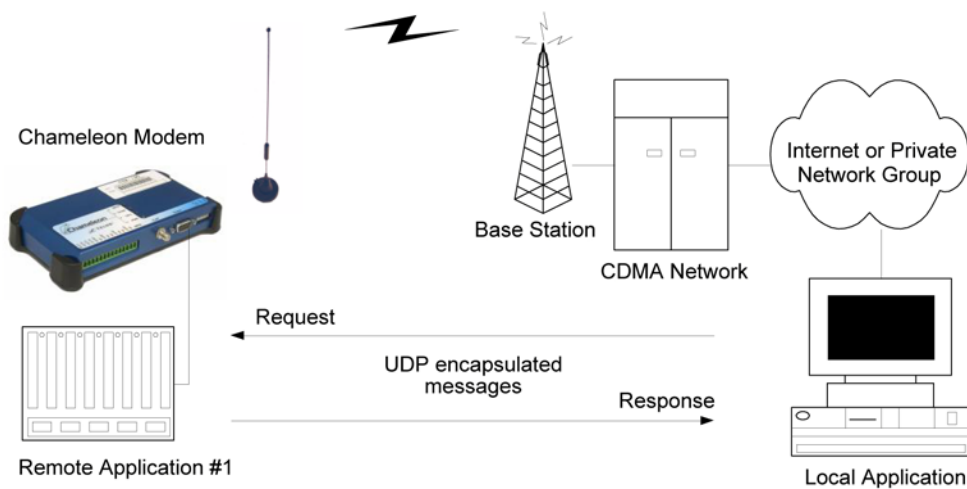
Closing a PAD connection can be done in various ways:

Send the escape sequence to the serial port (the default escape sequence is +++) – note that no “Enter” is required as part of the escape sequence. The modem will drop into AT command mode. The escape sequence may be changed using the AT^PADESC=<string> command - note the guard timer control using the AT^PADESCT=n command.

If DTR is configured using AT&D1 then dropping DTR will cause the PAD connection to drop and the modem will go into AT command mode. The PADSVC timer will expire after a period of inactivity equal to its setting (default 15 seconds). On the client modem once this timer expires the modem will go into server mode – use AT^PADSVCT=0 to keep the modem in client mode.

On TCP PAD connections if the server end drops the connection then a modem configured in MODE 3 (auto connect to network and PAD) and PADMODE 5 (auto connect TCP PAD client) will attempt to reconnect the TCP session.

Example configuration for a modem connected to a field device in slave mode: For this example the device connected to the modem’s serial port is operating at 9600 baud with no hardware flow control (Tx, Rx, & Gnd signals only), and responds to every incoming sentence with a reply of maximum length 50 bytes always terminated with the character <. The chosen listening port is 5000.



Configure the modem with its network allocated telephone number – see the manual.

AT&F1

AT^USER=<10 digit tel_num>@1x.telusmobility.com

AT^PSWD=<11 digit ESN>

AT^NUM=#777

AT^HOSTSP=9600

It will now be necessary to adjust the baud rate of the terminal application to 9600.

AT&D0

AT&K0

AT^HOSTIF=2

AT^PADMODE=0

AT^PADPORT=5000

AT^PADFWDC=60 (Decimal value of ASCII <)

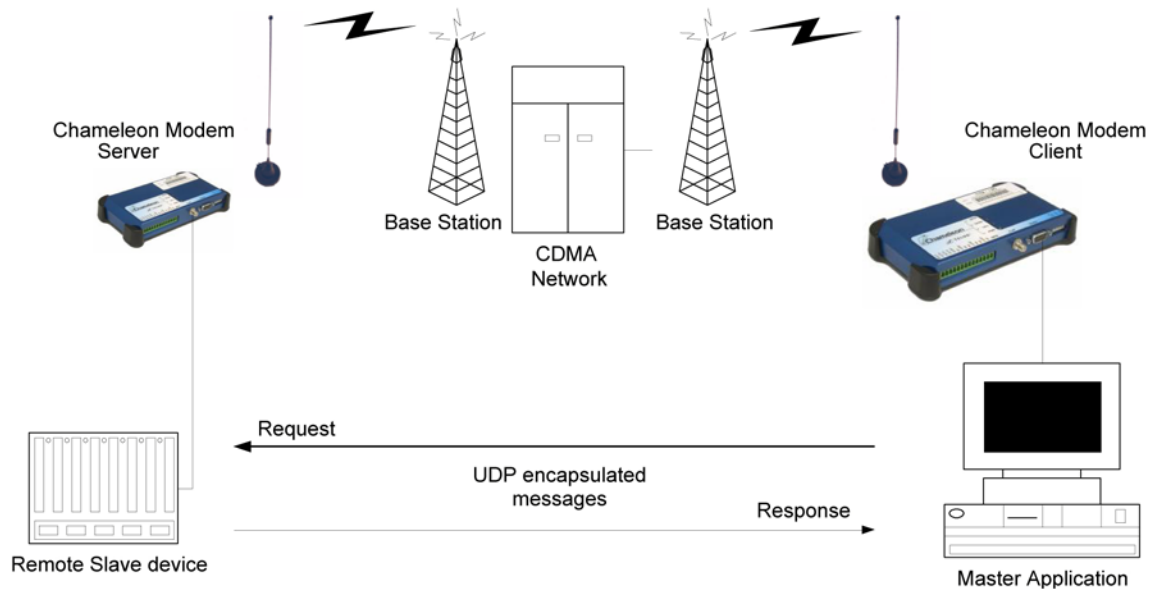
AT^PADFWDL=51 (Greater than longest message size)

AT^MODE=3 AT&W

Power cycle

Example configuration for a modem connected to a master device which is polling a remote slave device:

In this example the modem is connected to a master device at baud rate of 19200 with full hardware flow control. It receives sentences on its serial port of maximum length 100 bytes (with no common end character) which are to be sent to a single slave unit at IP address 100.100.1.2, port 5000. The slave device will never be sending an unsolicited message but may send a response to a request sent.



Configure the modem with its network allocated telephone number – see the manual.

AT&F1

AT^USER=<10 digit tel_num>@1x.telusmobility.com

AT^PSWD=<11 digit ESN>

AT^NUM=#777 AT^HOSTSP=19200

It will now be necessary to adjust the baud rate of the terminal application to 19200.

AT^HOSTIF=2

AT^PADADR=100.100.1.2

AT^PADPORT=5000

AT^PADFWDC= (no forwarding character)

AT^PADFWDL=101 (Greater than longest message size)

AT^PADFWDT=5 (sets the forwarding time to 0.5 seconds idle period)

AT^PADSVCT=0 (PAD client mode)

AT^MODE=3

AT&W

Power cycle

Note – if it is required for the modem to connect to a number of different remote slave devices then use AT^MODE=2 with AT^PADMODE=0 and connect each time using ATDTn.n.n.n where n.n.n.n is the IP address of the required slave. Then use the escape sequence (default +++) to close the connection and return to AT command mode for the next connection.

5 Technical Support/Warranty:

Cypress Solutions Service

Support Group

1.877.985.2878 or 604.294.4465

9.00am to 5.00pm PST

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