

MODBUS OPERATION



Model	Chameleon CTM-130/132 modem
Revision:	1849.0046#11 revision 1.0

3066 Beta Avenue Burnaby, B.C. V5G 4K4
Phone: 604.294.4465
Fax: 604.294.4471
support@cypress.bc.ca

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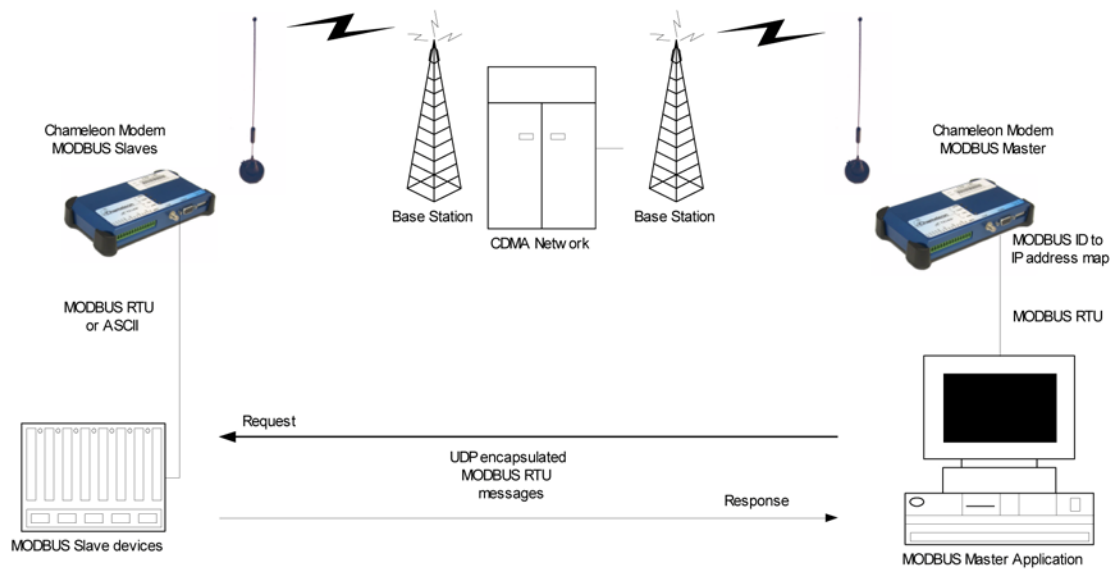
2 Revision Control

Description	Revision	Date
Customer Release	1849.0046#11 revision 1.0	5-July-2005

3 CTM-130/132 MODBUS Operation

The CTM-130/132 firmware version 1.2.0 and above support the MODBUS protocol commonly used in SCADA applications. The modem can be configured to be a MODBUS slave with its own MODBUS ID or to act as a MODBUS master message router.

This application note details how to setup the CTM-130 or CTM-132 CDMA wireless data modem in MODBUS mode. The MODBUS 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. MODBUS messages are sent as UDP packets over the 1x network.



4 AT Commands used for MODBUS operation:

Master & Slave units

Confirm that the modem has been configured with its 10 digit telephone number for operation on the CDMA network - see the operating manual for details.

Configure the modem with its user name, password, and network access dial number – see the operating manual for details.

The default serial port baud rate is 115,200. If you need to change the serial port settings use the following command:

`AT^HOSTSP=nnnn,P,D,S`

where nnnn is the required serial interface baud rate

P is the parity setting: N, E, or O

D is the number of data bits: 7 or 8

S is the number of stop bits: 1 or 2

You will now need to adjust the terminal application to these new settings.

If the end application does not use hardware flow control then it can be disabled:

`AT&K0`

If the application does not require the MODBUS connection to be controlled using the RS232 DTR signal then configure this using:

AT&D0 This will keep the PAD connection alive and ignore DTR dropping.

AT^HOSTIF=4 Serial port in MODBUS configuration.

AT^MODE=n Use n=2 if the host device connected to the modem's serial port will initiate the MODBUS connection using the ATDT command. Use n=3 if the modem is required to initiate the MODBUS connection – after a power cycle the modem will come up in MODBUS connected mode.

AT^MODBUSPROTOCOL=n Use n=0 for MODBUS RTU (default) Use n=1 for MODBUS ASCII (note that all “over the air” transactions use MODBUS RTU – the modem will act as a MODBUS RTU/ASCII converter).

AT^MODBUSPORT=n This is the UDP port that the slave will listen on for all incoming MODBUS messages. The master will listen on this port for any unsolicited MODBUS messages. Default is port 502.

Slave unit

AT^MODBUSMODE=0 Sets the modem in MODBUS slave mode (this is the default).

AT^MODBUSDEFIP=a.a.a.a This sets up the default IP address of the master modem . All unsolicited (report by exception) MODBUS messages will be sent to this IP address. If no unsolicited messages will be sent then use 0.0.0.0 (this is the default).

AT^MODBUSID=n If the slave modem is required to act as a MODBUS device itself (to read and set its I/O) then use this command to set its MODBUS ID in the range 1 to 247. Otherwise set n=0 (default). Note that all MODBUS messages with other Ids will be passed through the modem to the connected device.

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

Power cycle the modem This will initiate the MODBUS connect for AT^MODE=3.

Master unit

AT^MODBUSMODE=1	Sets the modem in MODBUS master mode.
AT^MODBUSIDMAP=n,a.a.a.a,p	This command is used to set up the master modem's MODBUS ID to IP map. n = the slave MODBUS ID, range 1 to 247 a.a.a.a = the IP address of the slave modem p = UDP port that the slave modem is listening on. Repeat this command for each slave unit.
AT&W	Save the current settings to non-volatile memory. The modem will now always power up in auto connect, MODBUS master mode with the settings as configured above.
Power cycle the modem.	This will initiate the MODBUS connect for AT^MODE=3.

To initiate a MODBUS connection from the modem:

If the modem has been configured in MODE 3 (auto connect network and MODBUS) 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 MODBUS connection using the ATDT command.

ATDT	MODBUS uses the UDP protocol for all messages which is a "connectionless" network connection. The ATDT command will initiate the connection to the 1x network (if AT^MODE=1) and then complete the connection to the MODBUS device (master or slave).
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Once the slave modem receives a MODBUS message and passes it over the serial port, the connected MODBUS device has 5 seconds to respond before the slave will treat the response as an unsolicited MODBUS message.

To close a MODBUS connection:

Closing a MODBUS connection can be done in various ways:

Send the escape sequence to the serial port (the escape sequence is +++) – note that no "Enter" is required as part of the escape sequence and there must be a 1 second quiet period before and after the escape sequence is entered. The modem will drop into AT command mode.

If DTR is configured using AT&D1 then dropping DTR will cause the MODBUS connection to drop and the modem will go into AT command mode.

5 Technical Support/Warranty:

Cypress Solutions Service

Support Group

1.877.985.2878 or 604.294.4465

9.00am to 5.00pm PST

support@cypress.bc.ca