



# Call Direct Cellular Solutions

## CD Series Cellular Router AT (V.250) Command Manual



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# Introduction

## ***Product overview***

In addition to traditional router functionality the Call Direct Cellular Solutions CDM800 series cellular routers (CDM) have been designed to facilitate the use of packet switched digital cellular networks in legacy applications which support a V.250 (V.25ter, AT, Hayes compatible) modem interface.

These applications often do not support the PPP and TCP/IP transport commonly supported by the digital cellular networks.

Although the CDM800 series includes a cellular terminal module the external application does not communicate directly with the digital cellular terminal, instead V.250 (AT) commands and data are processed by the CDM.

Any V.250 commands that the CDM does not process internally may optionally be passed to the internal cellular terminal in order to access terminal specific features.

Additionally the CDM can be configured for use as a standard circuit switched cellular data modem.

# Command and configuration reference

## Overview

V.250 (AT) commands, issued from your application are used to control and configure the CDM.

The CDM provides compatibility with legacy applications through compatibility with the standard V.250 AT command set, these commands can be used to control the basic functionality of the terminal.

In addition the CDM extends the V.250 command set to include a set of commands that can be used to configure and operate the CDM's unique features without interfering with operation of the basic V.250 interface.

## Operating states

In this manual reference is made to **command state**, **online command state** and **online data state**, these states are defined as follows: -

### **command state:**

In Command State, the terminal is not communicating with a remote station, and ready to accept V.250 commands.

Data from the local DTE are treated as command lines and processed by the terminal and responses are sent to the local DTE.

The terminal enters this state upon power-up, and when a call is disconnected.

### **online command state:**

In Online Command State, the terminal is communicating with a remote station, but treats data from the local DTE as command lines and sends responses to the local DTE.

Data received from the remote station during Online Command State is buffered in the terminal until Online Data State is once again entered (by a command from the DTE).

Data previously transmitted by the local DTE and buffered by the terminal will be transmitted from the buffer to the remote station during Online Command State.

Online Command State may be entered from Online Data state through the use of the '+++' escape sequence or via change of DTR state as configured by the [&D](#) command.

### **online data state:**

In Online Data State, the terminal is communicating with a remote station.

Data signals from the DTE are treated as data and transmitted to the remote station, and data received from the remote station are delivered to the DTE.

Data and control signals are monitored by the terminal to detect events such as loss of the remote connection and DTE requests for disconnection or switching to Online Command state.

Online Data State is entered by successful completion of a command to originate or answer a call, by automatically answering a call, by a DTE command to return to Online Data state from Online Command state or in response to the DTR signal as configured by the [&D](#) command.

## **Syntax Description**

This section provides a brief description of the syntax used for the CDM800 series AT command set. See the ITU-T recommendation V.250 for additional information.

### **DTE commands lines**

In the descriptions that follow, words enclosed in **<angle brackets>** are references to command elements or parameters, the brackets are not included in the command line. Words enclosed in **[square brackets]** represent optional items; such items may be omitted from the command line again the brackets are not included in the command line.

Other characters that appear in syntax descriptions shall appear in the places shown.

For clarity terminal responses are mentioned in terms of their alphabetic format; the actual response issued will depend on the setting of parameters that affect response formats (e.g. **Q** and **V** commands).

### **Command line general format**

A command line is made up of three elements: the prefix, the body, and the termination character.

- The command line prefix consists of the characters "**AT**" or "**at**".
- The body is made up of individual commands as specified later in this document.
- Space characters are ignored and may be used freely for formatting purposes, unless they are embedded in numeric or string constants.
- The termination character may not appear in the body.
- The terminal is capable of accepting 128 characters in the body.

### **Command line echo**

The terminal may echo characters received from the host during command state and online command state back to the host, depending on the setting of the **E** command. If enabled, characters received from the host are echoed at the same rate, parity, and format as received.

Characters not recognized as valid in the command line or of incomplete or improperly formed command line prefixes are not echoed.

### **Types of DTE commands**

There are two types of commands: action commands and parameter commands.

Action commands may be "executed" (to invoke a particular function of the terminal, which generally involves more than the simple storage of a value for later use), or "tested" (to determine whether or not the terminal implements the action command, and, if parameters are associated with the action, the ranges of parameter values that are supported).

Parameter commands may be "set" (to store a value or values for later use), "read" (to determine the current value or values stored), or "tested" (to determine whether or not the equipment implements the parameter, and the ranges of values supported).

## DTE command syntax

Two different command formats as specified by the 2.250 specification are supported these are basic and extended commands as described below.

### Basic syntax command format

The format of Basic Syntax commands, except for the D and S commands, is as follows:

**<command> [<number>]**

- Where **<command>** is either a single character, or the "&" character followed by a single character. Characters used in **<command>** shall be taken from the set of alphabetic characters.
- **<number>** may be a string of one or more characters from "0" through "9" representing a decimal integer value. Commands that expect a **<number>** are noted in the description of the command.
- If a command does not expect a **<number>** and a number is present, an **ERROR** is generated. All leading "0"s in **<number>** are ignored by the terminal.
- Additional commands may follow a command (and associated parameter, if any) on the same command line without any character required for separation. The actions of some commands cause the remainder of the command line to be ignored (e.g. **A**).

Special Note:

As an extension to the V.250 standard basic commands in the CDM800 series will also accept *test* and *query* syntax described as below.

**<command>?**

The current values (if any) stored for the parameter are sent to the terminal in an information text response.

The format of this response is described in the definition of the parameter. Generally, the values will be sent in the same form in which they would be issued by the host in a parameter setting command

**<command>=?**

If the terminal does not recognize the indicated command, it returns an **ERROR** result code and terminates processing of the command line.

If the terminal does recognize the parameter name, it shall return an information text response to the host, followed by an **OK** result code. The information text response shall indicate the **<numbers>** supported by the terminal.

## S-parameters

Commands that begin with the letter "S" constitute a special group of parameters known as "S-parameters". These differ from other commands in important respects. The number following the "S" indicates the "parameter number" being referenced. If the number is not recognized as a valid parameter number, an **ERROR** result code is issued. Immediately following this number, either a "?" or "=" character shall appear. "?" is used to read the current value of the indicated S-parameter; "=" is used to set the S-parameter to a new value.

**S<parameter\_number>?**

**S<parameter\_number>= [<value>]**

If the "=" is used, the new value to be stored in the S-parameter is specified in decimal following the ". If no value is given (i.e. the end of the command line occurs or the next command follows immediately), an **ERROR** result code issued and the stored value left unchanged.

The ranges of acceptable values are given in the description of each S-parameter.

If the "?" is used, the terminal transmits a single line of information text to the host.

This information text consists of exactly three characters, giving the value of the S-parameter in decimal, with leading zeroes included.

## **Extended syntax commands**

Both actions and parameters have names, which are used in the related commands. Names always begin with the character "+" or "^".

Following the "+" or "^", from one to sixteen (16) additional characters appear in the command name.

The command interpreter in the terminal considers lower-case characters to be the same as their upper-case equivalents.

## **Values**

When subparameters are associated with the execution of an action, or when setting a parameter, the command may include specification of values. This is indicated by the appearance of <value> in the descriptions below.



# AT Command specifications

## V.250 Configuration commands

### **&F    *Restore factory defaults***

Loads the terminal configuration with factory default values.

The factory default values for each parameter command can be found in the description for each command in this document.

Note this applies to certain V.250 parameters ONLY, to perform a complete factory reset refer to the ^FACTORY command.

**Default:**                      N/A

**Command values:**    N/A

### **Z        *Soft reset and restore saved settings***

Loads the terminal configuration to non-volatile memory

**Default:**                      N/A

**Command values:**    N/A

### **&W    *Save configuration to non-volatile memory***

Saves the terminal configuration to non-volatile memory.

The saved configuration values will be restored automatically on power up or if the Z command is issued.

**Default:**                      N/A

**Command values:**    N/A

### **E        *Command Echo***

Whilst in command mode, controls the echo of characters received by the terminal from the host.

**Default:**                      1            **Storage:**            &W Command

**Command values:**

E0      Disable echo of incoming characters in command mode.

E1      Enable echo of incoming characters in command mode.

## **Q     *Quiet mode***

Whilst in command mode, controls whether the terminal will send result codes and unsolicited responses to the host.

NB this does not suppress the terminal from sending solicited responses.

**Default:**                    **1            Storage:        &W Command**

### **Command values:**

Q0     Send result codes and unsolicited responses.

Q1     Do not send result codes and unsolicited responses.

## **V     *Result code form***

Selects whether the terminal sends long form (verbose) or short-form (numeric) responses to the host.

**Default:**                    **1            Storage:        &W Command**

### **Command values:**

V0     Send short form (numeric) codes.

V1     Send long form (verbose) result codes.

## **I     *Identification***

Reports information to the host that may be used to help identify the product.

**Default:**                    **0**

### **Command values:**

I0     Report product identity.

I1     Report software version.

## **^CROK     *Send OK response to <CR>***

Enables or disables sending of an OK response when the unit receives the <CR> character by itself.

**Default:**                    **0            Storage:        &W Command**

### **Command values:**

^CROK=0     Do not send OK in response to <CR>

^CROK=1     Send OK in response to <CR>

### ***^NOLF     Disable sending <LF> in response messages***

Enables or disables sending the <LF> character in response messages.

**Default:**                      0                      **Storage:**                      &W Command

#### **Command values:**

^NOLF=0     Send <CR><LF> in response messages

^NOLF=1     Send <LF> in response messages

### ***^NOER     Disable ERROR response to unknown commands***

Enables or disables sending an ERROR response to unknown commands. When the ERROR response is disabled the terminal will instead send an OK response to unknown commands. This may allow the terminal to be used in applications where the host issues AT commands that would otherwise be incompatible with the CDM800.

**Default:**                      0                      **Storage:**                      &W Command

#### **Command values:**

^NOER=0     Send ERROR response to unknown commands.

^NOER=1     Send OK response to unknown commands

### ***^PAST     Pass unknown V.250 commands to phone module.***

Enables or disables pass-through of V.250 commands that the CDM800 V.250 command interpreter does not recognize (IE any command not specifically listed in this document) to the internal cellular telephone module. Please see the appropriate the appendix at the end of this document for further details of supported commands.

**Default:**                      1                      **Storage:**                      &W

#### **Command values:**

^PAST=0     Return ERROR or OK to unknown commands as per the ^NOER setting.

^PAST=1     Forward **unknown** commands to the internal phone module.

^PAST=2     Forward **all** commands to phone module packet data port.

^PAST=3     N/A

^PAST=4     Enable PPP Server mode

^PAST=5     N/A

^PAST=6     Forward **all** commands to phone module primary AT command port.

## ***^EMUL    Enable special device emulation***

The ^EMUL command configures the cellular router to emulate other devices.

**Default:**                      **0**                      **Storage:**                      **&W Command**

### **Command values:**

^EMUL=0    Disable emulation router operates per this manual.  
^EMUL=1    Emulate TMR trunked radio.

## DCE-DTE Interface commands

### **&D DTR Configuration**

This parameter determines how the terminal responds when the DTR circuit changes state.

**Default:**       **&D0**                   **Storage:**       **&W**

#### **Command values:**

- |     |                                                                                                                                                                                                                                                                                                                                          |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| &D0 | Ignore DTR.                                                                                                                                                                                                                                                                                                                              |
| &D1 | If in <a href="#">online data state</a> upon an <i>on-to-off</i> transition, the terminal enters <a href="#">online command state</a> and issues an OK result code; the call remains connected.                                                                                                                                          |
| &D2 | If in <a href="#">online data state</a> or <a href="#">online command state</a> upon an <i>on-to-off</i> transition, the terminal performs an orderly clear-down of the call and returns to <a href="#">command state</a> .<br>Automatic answer is disabled while DTR remains off.                                                       |
| &D3 | Terminal “Auto-dials” default remote station (as determined by ^DHST) on <i>off-to-on</i> transition of DTR and enters <a href="#">online data state</a> . Terminal ends call and enters <a href="#">command state</a> on <i>on-to-off</i> transition of DTR.                                                                            |
| &D4 | Terminal “Auto-dials” default remote station (as determined by ^DHST) on <i>on-to-off</i> transition of DTR and enters <a href="#">online data state</a> . Terminal ends call and enters <a href="#">command state</a> on <i>off-to-on</i> transition of DTR.                                                                            |
| &D5 | When DTR is <i>off</i> pass all commands directly to the internal cellular engine.<br>When DTR is <i>on</i> commands are processed by the CDM800 V.250 command interpreter, any commands not processed by the CDM800 V.250 command interpreter are passed to the cellular engine in accordance with the <a href="#">^PAST</a> parameter. |

## **&S    *DSR Configuration***

This parameter determines how the terminal controls the state of the DSR circuit.

**Default:**        **&S0**                      **Storage:**        **&W**

### **Command values:**

&S0	DSR always ON.
&S1	DSR ON when signal present and phone registered on network.
&S2	DSR ON when cellular packet data session established.
&S3	DSR always OFF

## **&C    *DCD Configuration***

This parameter determines how the terminal controls the state of the DCD circuit.

**Default:**        **&C1**                      **Storage:**        **&W**

### **Command values:**

&C0	DCD always ON.
&C1	DCD ON when connected to remote host.
&C2	DCD always OFF.
&C3	DCD ON when cellular PPP session established.

## **&N    *RI Configuration***

This parameter determines how the terminal controls the state of the RI circuit.

**Default:**        **&N1**                      **Storage:**        **&W**

### **Command values:**

&N0	RI always ON.
&N1	RI simulates incoming ring.
&N2	RI always OFF.

### ***+IPR Local RS-232 interface baud rate***

This parameter determines the baud rate at which data will be sent and received on the local RS-232 interface.

**Default:**        **115200**                      **Storage:**        **&W**

#### **Command values:**

**+IPR=<rate>**

Where **<rate>** is a one of the following: -

300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400

### **+ICF Local RS-232 interface character framing**

This parameter determines the character framing which used at the local RS-232 interface.

**Default:**        **3,1**                      **Storage:**        **&W**

#### **Command values:**

+ICF=<format>,[<parity>]

Where <format> is a single digit and determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame according to the following table: -

<b>&lt;format&gt;</b>	<b>Meaning</b>
<b>1</b>	8 Data 2 Stop
<b>2</b>	8 Data 1 Parity 1 Stop
<b>3</b>	8 Data 1 Stop
<b>4</b>	7 Data 2 Stop
<b>5</b>	7 Data 1 Parity 1 Stop
<b>6</b>	7 Data 1 Stop

And where <parity> is a single digit and determines how the parity bit is generated and checked, if present according to the following table: -

<b>&lt;parity&gt;</b>	<b>Meaning</b>
<b>0</b>	Odd
<b>1</b>	Even

<parity> is ignored where format is one of 1,3,4 or 6.



### **+*IFC* Local RS-232 flow control**

This parameter is used to control the operation of local flow control between the terminal and the local DTE.

**Default:**        0,0                      **Storage:**        &W

#### **Command values:**

**AT+IFC**=<DCE\_by\_DTE>,<DTE\_by\_DCE>†

Where:

- |              |                                                                                                  |
|--------------|--------------------------------------------------------------------------------------------------|
| <DCE_by_DTE> | Specifies the method to be used by the DTE to control the flow of received data from the DCE.    |
| <DTE_by_DCE> | Specifies the method to be used by the DCE to control the flow of transmitted data from the DTE. |

The valid numeric variables for the **+IFC** command are as follows:

- |   |                 |
|---|-----------------|
| 0 | No Flow Control |
| 2 | Hardware        |

By default, the modem is set up as **AT+IFC=2,2** to allow hardware flow control in both directions.

## V.250 Session management commands

### **D    *Dial (Establish Connection)***

Establish a connection.

The type of connection established is dependant upon the format of the dial string supplied as described below.

The CDM supports 2 different types of packet data connections as follows:-

#### *Packet Data Call*

The packet data connection (PPP Session) is terminated at the connected device, in this case the CDM acts as a MODEM.

#### *Packet Data Session*

The packet data connection (PPP Session) is terminated at the CDM, in this case the CDM acts as a ROUTER.

The CDM also supports *Circuit Switched Data* calls, in this case the CDM acts as a traditional circuit switched MODEM.

**Default:**                      N/A    **Storage:**              N/A

#### **Command values:**

##### **ATD\*99#**

Sets up a *Packet Data Call* based on context #1 as set using the +CGDCONT command.

The CDM supports only 1 packet data call at a time, this command will return 'BUSY' if another packet data call is in progress.

##### **ATD\*99\*\*\*<n>#**

Sets up a packet data call based on context #<n> as set using the +CGDCONT command where <n> is the <cid> of the +CGDCONT context.

The CDM supports only 1 packet data call at a time, this command will return 'BUSY' if another packet data call is in progress.

**ATD<n>**

Establishes a *Packet Data Session* based on profile <n> as set using the ^PRFL command or browser based configuration 'profile number' on the 'Data Connection' page.

If the selected profile is configured for PAD client mode a PAD session is established to the host defined in the profile.

**ATD<phone number>**

Originates a *Circuit Switched Data* call to <phone number>

**ATD<host>[:<port>[:<protocol>]]**

Originates a PAD session to the <host> and <port> <protocol> provided.

The <host> parameter may be an IP address or hostname.

The <port> parameter is optional if not supplied the port number from the currently selected profile is used.

The <protocol> is optional and may be one of "TCP" or "UDP", if not supplied the protocol from the currently selected profile is used.

## ***H Hang Up***

This command instructs the terminal to disconnect from the remote device terminating any session in progress.

**Default:** N/A    **Storage:** N/A

**Command values:** N/A

## ***O Return to On line state***

This command instructs the terminal to return to [online data state](#) and issue a **CONNECT** or **CONNECT <text>** result code.

**Default:** N/A    **Storage:** N/A

**Command values:** N/A

## ***+++ Enter On line command state***

If the terminal detects the ‘+++’ escape sequence in [online data state](#) the terminal will enter online command state.

**Default:** N/A    **Storage:** N/A

**Command values:** N/A

# Cellular Packet Session management commands

## **^PRFL      Profile Configuration**

The ^PRFL command allows one to configure up to four different dialing profiles with different parameters.

NB: Some of these profiles may be factory configured and not reconfigurable by the end user per telecommunications carrier requirements.

### **Default:**

1,atd\*99#,,,0,0,0,0.0.0.0,0,telstra.internet  
2,atd\*99#,,,0,0,0,0.0.0.0,0,telstra.datapack  
3,atd\*99#,,,0,0,0,0.0.0.0,0,telstra.pcpack  
4,atd\*99#,,,0,0,0,0.0.0.0,0,

**Storage:          Automatic**

### **Command values:**

**^PRFL=<parameters listed below>**

Defines a profile as per settings below.

**^PRFL?**

Queries all current profile settings.

<b>Argument Number/Type</b>	<b>Parameters</b>
1.) Profile Number:	[1..4]
2.) Phone Number To Dial:	<b>atd*99#</b> -For Packet Data Calls
3.) Username:	Username For This Connection
4.) Password:	Password For This Connection
5.) PAD Mode:	0=Disable PAD 1=TCP Connection 2=UDP Connection
6.) PAD Functionality:	0=Cellular router will act as client 1=Cellular router will act as server
7.) Local serial protocol:	0=No encoding, data is sent without any encapsulation 1=Encode with Addressed Serial Protocol (See appendix A for details)
9.) PAD Host:	Where: vvv.www.xxx.yyy - The IP address to connect to when acting as a client vvv.www.xxx.yyy - The trusted incoming IP address to listen to when acting as server, set to 0.0.0.0 to accept connections from any remote address
10.) Port Connection:	zzzzz - Port to connect to in client mode. zzzzz - Port to listen to in server mode.

11) APN:

Access Point Name of network to connect to.

### ***^GASC    Enable cellular packet session auto connect***

Enables or disables automatic connection and log-in to the cellular packet network.

**Default:**                      **0**            **Storage:**            **&W Command**

#### **Command values:**

^GASC=0    Do not connect to cellular packet network.  
^GASC=1    Connect to cellular packet network using profile 1  
^GASC=2    Connect to cellular packet network using profile 2  
^GASC=3    Connect to cellular packet network using profile 3  
^GASC=4    Connect to cellular packet network using profile 4

### ***^GRST    End Cellular Packet Session***

This command will kill the current cellular packet session and bring the modem to Command State. NOTE: This command will tear down the cellular packet session in an orderly manner and may take several seconds to complete.

**Default:**                      **N/A**            **Storage:**            **N/A**

#### **Command values:**

^GRST                      Kills the current cellular packet session.

NOTE: If ^GASC=1, the modem will detect that the session dropped and will immediately reconnect. To fully disconnect, set ^GASC=0 and then issue the ^GRST command.

## PAD Configuration commands

### ***^IDNT      PAD identification string***

This command is used to configure an identification string to be sent at the beginning of each PAD session.

This string will be sent followed by a terminating <LF> either as the first UDP datagram or the first bytes of a TCP stream.

If this parameter is not set (empty) no identification data is sent, nor is the terminating <LF>

**Default:**      <empty>

**Storage:**      &W

#### **Command values:**

**^IDNT=<ID>**      Where <ID> is a string with maximum length of 32 bytes.

### ***^ICTO      Inter-character timer***

This command is used to configure the Inter-Character timeout used by the PAD service when assembling packets for transmission.

The PAD will send a packet of data every time the buffer is full (512 Bytes) or if the serial data line is idle for longer than the time specified by this command.

**Default:**      50

**Storage:**      &W

#### **Command values:**

**^PADM=<timeout>**      Where <timeout> is a number between 0 and 65535 milliseconds.

## LAN Configuration commands

The commands below are used to configure the Ethernet LAN interface. There is no error checking beyond octet validation (Four octets of 0-255) for any of the Ethernet address assignments. E.g. If you set the netmask to an invalid address, the modem will accept it but may be unable to transfer via the LAN interface.

### ***^ETHI      Set the LAN Ethernet IP address***

This command will set the LAN interface IP address.

**Default:**      192.168.1.50      **Storage:**      &W

#### **Command values:**

^ETHI=<IP Address>      Sets the Ethernet IP.  
^ETHI?      Queries the current Ethernet IP.

### ***^ETHN      Set the local Ethernet Mask***

This command will set the LAN interface IP netmask.

**Default:**      255.255.255.0      **Storage:**      &W

#### **Command values:**

^ETHN=<netmask>      Sets the Ethernet mask.  
^ETHN?      Queries the current Ethernet mask.

### ***^ETHR      Print the Route Table***

This command will print a copy of the modem's routing table.

**Default:**      N/A      **Storage:**      N/A

#### **Command values:**

^ETHR?      Prints the modem's routing table



### ***^MACA    Set the LAN Ethernet MAC address***

This command will set the LAN interface Ethernet MAC address.

To reset the MAC address back to the factory configured address use the command “AT^MACA=” and then reboot the router.

**Default:**        factory unique        **Storage:**        &W

#### **Command values:**

^MACA=<MAC Address>    Sets the Ethernet MAC address.

^MACA?                      Queries the current Ethernet MAC address.

### ***^IFCG    Print the Interface Configuration***

This command will print the cellular router’s IP interface configuration details.

**Default:**        N/A                      **Storage:**        N/A

#### **Command values:**

^IFCG?                      Prints the router’s IP interface configuration details.

### ***^PPPOE    Enable PPPoE Mode***

Enables or disables PPPoE mode.

**Default:**                      0                      **Storage:**        &W Command

#### **Command values:**

^PPPOE=0    Disable PPPoE mode.

^PPPOE=1    Enable PPPoE mode.

### ***^MASQ    Enable DNS masquerade.***

Enables or disables DNS masquerading.

**Default:**                      0                      **Storage:**        &W Command

#### **Command values:**

^MASQ=0    Disable DNS masquerading.

^MASQ=1    Enable DNS masquerading.

## ***^DHCP      Configure DHCP server***

This command performs configures the cellular router's DHCP server.

**Default:**      **192.168.1.120,192.168.1.199,86400,192.168.1.50,0.0.0.0**  
**Storage:**      **&W**

### **Command values:**

**^DHCP=** <First IP address>,<Last IP address>,<Lease Time>,<DNS1>,<DNS2>

#### *Where:*

< First IP address >	First IP address in IP address pool
< Last IP address >	Last IP address in IP address pool
< Lease Time >	DHCP Lease time in seconds
<DNS1>	Primary DNS server IP address
<DNS2>	Primary DNS server IP address

If none of the above parameters are supplied the DHCP is disabled.

**^DHCP?** Queries DHCP configuration

#### *Where:*

< First IP address >	First IP address in IP address pool
< Last IP address >	Last IP address in IP address pool
< Lease Time >	DHCP Lease time in seconds
<DNS1>	Primary DNS server IP address
<DNS2>	Secondary DNS server IP address

## ***^MAPP      Configure NAT translation***

This command can be used to configure the cellular routers NAT table.

**Default:**        N/A                                **Storage:**        &W

### **Command values:**

**^MAPP=** <source IP address>,<incoming port number>,<destination IP address>,<destination port number>

*Where:*

<source IP address>	IP address of remote client
<incoming port number>	incoming port number
<destination IP address>	IP address
<destination port number>	destination port number

The cellular router's NAT function can be used to forward incoming TCP connections or UDP datagrams to an alternative IP address and port number.

The <source IP address> parameter may be set to 0.0.0.0 to accept connections from ANY host otherwise this translation will only apply to connections from the specified host.

The <incoming port number> parameter specifies the port number that the cellular router listens or accepts datagrams on.

The <destination IP address> parameter specifies the IP address to redirect connections/datagrams to.

The < destination port number > parameter specifies the port number to redirect connections/datagrams to.

**^MAPP?** Queries NAT configuration

## Miscellaneous, system, test and diagnostic commands

### ***^RESET    Reset the cellular router***

This command initiates a soft reset (reboot) of the cellular router, any active PAD and cellular packet data sessions are abruptly terminated.

**Default:**        N/A                      **Storage:**        NA

**Command values:**

N/A

### ***^FACTORY        Reset the cellular router configuration***

This command resets the cellular routers configuration to factory defaults, this resets ALL configuration data.

**Default:**        N/A                      **Storage:**        Automatic

**Command values:**

N/A

### ***^COPT        Configuration options.***

This command can be used to show or set a number of terminal specific options. The command expects / returns an integer value between 0 and 255 which represents a bitmap of various options.

**Default:**        0                                      **Storage:**        Automatic

**Command values:**

**^COPT=<bitmap>**

Where the bits in <bitmap> are defined as follows: -

- |   |                     |                                           |
|---|---------------------|-------------------------------------------|
| 1 | Banner off          | Do not show power on welcome message.     |
| 2 | Connect message off | Do not show connection progress messages. |

**<sup>^</sup>PRT**      *Periodic reset timer*

This command is used to configure the periodic reset timer.

The periodic reset timer can be used to perform a complete system reboot at the end of the specified time.

This is reboot is designed to function as closely as possible to removing and re-applying power to the terminal (without actually doing so).

This reboot will occur at the specified interval regardless of any other condition.

NB if the device is in a “call” and the periodic reset timer expires the call will be unexpectedly terminated.

The terminal does NOT perform an orderly clear down of the call from the application point of view; it does however attempt an orderly shutdown of the cellular module.

The periodic reset timer always starts from the time the terminal is powered up or reset, even if  $\wedge\text{PRT} = 0$ . This means that if the terminal has been running for some time and the user sets  $\wedge\text{PRT}$  to a value less than the period of time since the unit was last reset the unit will immediately reset.

A value of 0 disables the periodic reset timer.

**Default:** 0

**Storage:** &W

### Command values:

**^PRT=<timeout>** Where <timeout> is a number between 0 and 65535 minutes.

NOTE – This command can be used to perform a modem reset, i.e by sending **AT^PRT=1** means that within one second the modem will reboot.

**^GLUP**     *Perform a Domain name lookup*

This command performs a domain name lookup for a given domain name such as `www.call-direct.com.au`

**Default:** N/A

**Storage:** NA

## Command values:

^GLUP=<url> Perform a domain name lookup.

## ***^PING      Ping an IP address***

This command performs a ping for a given IP address or domain name.

**Default:**      N/A                      **Storage:**      NA

### **Command values:**

^PING= <domain name or IP address>      Ping the domain name or IP address

## ***^LTPH      Periodically Ping an IP address***

This command performs a periodic ping for a given IP address or domain name.

**Default:**      0.0.0.0,0.0.0.0,0,0,0                      **Storage:**      &W

### **Command values:**

^LTPH =      <Address 1>,  
                 <Address 2>,  
                 <timer>,<acceleration timer>,<failure count>

### *Where:*

<Address 1>	Primary address to ping
<Address 2>	Backup address to ping
<timer>	The periodic time to ping in secs (e.g. every 60 seconds)
<acceleration timer>	The periodic time in secs to revert to if a ping fails
<failure count>	The number of pings that can fail to trigger a reboot.

^LTPH? Queries ltph configuration

### *Where:*

<Address 1>	Primary address to ping
<Address 2>	Backup address to ping
<timer>	The periodic time to ping in secs (e.g. every 60 seconds)
<acceleration timer>	The periodic time in secs to revert to if a ping fails
<failure count>	The number of pings that can fail to trigger a reboot.
<reset count>	The number of times the modem has been reset.

## **+CSQ      *Obtains the Signal Strength***

This command queries the signal strength for the cellular interface.

**Default:**      N/A                      **Storage:**      N/A

**Command values:**

+CSQ Queries the signal strength

## Appendix A

### Addressed Serial Protocol Specification

Call Direct Cellular Solutions have implemented the following protocol to Allow a master station to communicate with a number of remote stations via GPRS.

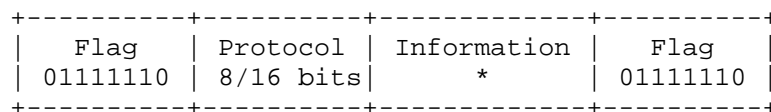
In particular the master station must be able to identify individual remote stations sending data to the master and in turn be able to direct transmissions to a specific remote station.

In order to provide this addressability the following protocol is defined.

All data will be sent encapsulated in HDLC like frames with the IP address of the remote station (in standard network byte order) as the first 4 information bytes of each frame, application data starts at the 5th byte of the information field of each frame.

#### Frame Format

A summary of the HDLC-like frame structure is shown below. This figure does not include bits inserted for synchronization (such as start and stop bits for asynchronous links), nor any bits or octets inserted for transparency. The fields are transmitted from left to right.



NB The standard HDLC Address, Control and FCS fields are not used or present.

#### Flag Field

The Flag Sequence indicates the beginning or end of a frame, and is used for frame synchronization. The bit stream is examined for the binary sequence 01111110 (hexadecimal 0x7e).

#### Transparency

An octet stuffing procedure is used. The Control Escape octet is defined as binary 01111101 (hexadecimal 0x7d), most significant bit first.

Each Flag Sequence and Control Escape octet, is replaced by a two octet sequence consisting of the Control Escape octet followed by the original octet exclusive-or'd with hexadecimal 0x20.

Escaped data is transmitted on the link as follows:

0x7e is encoded as 0x7d, 0x5e. (Flag Sequence)  
0x7d is encoded as 0x7d, 0x5d. (Control Escape)

#### Protocol Field

The Protocol field is consistent with the ISO 3309 (HDLC) extension mechanism for Address fields. All Protocols are assigned such that the least significant bit of the most significant octet equals "0",



and the least significant bit of the least significant octet equals "1".

Presently the only defined protocol type is 0x99 (Addressed Serial Data).

i.e. All frames start with 0x7E, 0x99

#### Information Field

The information field is structured as follows.

+-----+-----+	
Remote Address	Application Data
32 bits	*
+-----+-----+	

Where the remote address contains the IP address of the remote device in network byte order.