MOTOROLA

iDEN ™ *RF Interface*

Mobile Subscriber DTE/DCE
Interface for Data Services

Protocol Manual
68P81129E10-C

Notice: This is one in a series of documents as listed in the following table.

iDEN Protocol Documentation Cross-reference

Document Part Number	Document Title	Original Contrated Categories						Added Categories		
		Switch to BSC (A-Interface)	Switch To Switch Interface (Currently Open Interface)	Switch To HLR Interface (See note 2)	BSC To DAP Interface	Air Interface (Mobile To EBTS)	Circuit Switch IWF Interface (See note 2)	DTE/DCE Interface	Mobile To Short Message Service / Service Center	Hardware Specifications
68P81127E88	iDEN RF Interface Layer 1					■				
68P81127E89	iDEN RF Interface Layer 2					■				
68P81127E90	iDEN RF Interface Layer 3: General Aspects					■				
68P81127E91	iDEN RF Interface Layer: Radio Link Control					■				
68P81127E92	iDEN RF Interface Layer: BCCH Data					■				
68P81127E93	iDEN RF Interface Layer 3: General Information On Supplemental Services					■				
68P81127E95	iDEN RF Interface: Layer 3 Procedures for Dispatch Operation					■				
68P81127E96	iDEN RF Interface Layer 3: Messages					■				
68P81127E97	iDEN RF Interface: Short Messag Service					■			■	
68P81127E98	Radio Link Protocol					■	■			
68P81127E99	In-Band Protocol	■				■	■			
68P81129E01	iDEN RF Interface Layer 3: General Information On Supplemental Services					■				
68P81129E02	iDEN RF Interface: Alternate Line Service Specification					■				
68P81129E03	MSO to RF Site: Dispatch Interface Layers 1 & 2				■					
68P81129E04	MSO to RF Site: Dispatch Interface Bearer Channel for Voice, VESELP & DADA				■					
68P81129E05	MSO to RF Site: Dispatch Interface Layer 3: Messages				■					
68P81129E06	MSO to RF Site: Dispatch Interface Layer 3: Procedures				■					
68P81129E07	Reserved									
68P81129E08	Reserved									
68P81129E09	iDEN Transceiver Specifications									■
68P81129E10	Mobile Subscriber DTE/DCE Interface for Data Services							■		
68P81129E11	iDEN Naming Specification					■				
68P81129E12	A-Interface In iDEN Systems	■								
68P81129E13	iDEN Map Interface		■	■						
68P81129E14	iDEN RF Interface: Procedures for Supplemental Services - Message Contents (Replaced by 68P81129E01)					■				
68P81129E15	VSELP 4200 BPS Voice Coding Algorithm For iDEN					■				

Notes: 1. Shaded boxes match the catagories to specific document(s).

2. Represents only Motorola controlled changes.

68P81129E10 Revision History

Date	Version	Comments
10/10/94	O	First release
6/29/95	A	Changed all MIRS references to iDEN.
5/12/97	B	Complete re-write to add 4-wire implementation and support for S9, &W, dial modifiers, PCCA STD101, Annex F, Annex L, iDEN Packet Data and GSM 7.07.
4/20/99	C	Release of document for i1000plus and compatible products

Table Of Contents

1 Document Overview

1.1 Introduction

This document defines the DTE/DCE interface used for data services. At the time of publication, the supported data services are Circuit Data, Packet Data, and Facsimile.

1.1.1 Scope

The objective of this document is to provide an overview of the iDEN Data Services with a focus on the DTE/DCE interface. The document is written for an audience who is interested in the development of applications that will take advantage of the data services that iDEN has to offer. It is assumed that the audience is familiar with data networking and networking terminology, but not necessarily familiar with wireless communications.

1.1.2 Notice of Volatility

This document was written and released as an attempt to detail the iDEN DTE/DCE Interface for the i1000plus and compatible products. No changes are currently planned for this specification. Any changes that are made will most likely be to default values, or the elimination of some values as supported settings.

1.2   Acronyms And Abbreviations

- ASCII   American Standard Code for Information Interchange
- BER   Bit Error Rate
- CDPD   Cellular Digital Packet Data
- CSLIP   Compressed Serial Line Interface Protocol
- DCE   Date Communications Equipment
- DCS   Negotiated Subparameters
- DTE   Data Terminal Equipment
- ECM   Error Correction Mode
- EIA   Electronics Industry Association
- FNE   Fixed Network Equipment
- Fax   Facsimile
- GSM   Groupe Special Mobile
- iDEN   Integrated Digital Enhanced Network
- ICMP   Internet Control Message Protocol
- IETF   Internet Engineering Task Force
- IP   Internet Protocol
- LAPi   Link Air Protocol - iDEN
- MIP   Mobile Internet Protocol
- MS   Mobile Station, An iDEN Subscriber Unit
- MSC   Mobile Switching Center
- msIP   iDEN Mobile Subscriber Internet Protocol
- NIC   Network Information Center
- NEI   Network Equipment Identifier
- PIN   Personal Identification Number
- RF   Radio Frequency
- RFC   Request For Comments
- RLP   Radio Link Protocol (GSM)
- RSSI   Received Signal Strength Indication
- SPI   Security Parameter Index
- TIA   Telecommunications Industry Association
- TDMA   Time Division Multiple Access
- TSI   Remote ID
- PCCA   Portable Computer and Communications Association
- PPP   Point To Point Protocol
- PSTN   Public Switched Telephone Network
- RCP   Radio Control Protocol
- SLIP   Serial Line Interface Protocol
- TCP   Transmission Control Protocol
- UDP   User Datagram Protocol
- WDS   Wireless Data System

1.3   References

1   *iDEN RF Interface: Radio Link Protocol* (68P81127E98)

2   *In-Band Protocol* (68P81127E99)

3   *Data Transmission Systems and Equipment -- Serial Asynchronous Automatic Dialing and Control* (TIA/EIA-602)

4   Data Transmission Systems and Equipment - Extended Command Syntax (ANSI/TIA/EIA-615)

5   *Asynchronous Facsimile DCE Control Standard Draft EIA standard, August 1990* (SP2388)

6   *Interface Between Data Terminal Equipment and Data Circuit Terminating Equipment Employing Serial Binary Data Interchange* (EIA/TIA-232-E)

7   *Serial Asynchronous Automatic Dialing and Control for Character Mode DCE on Wireless Data Services* (PCCA STD-101)

8   *Serial Asynchronous Automatic Dialing and Control for Character Mode DCE on Wireless Data Services - Annex F: Miscellaneous Commands*

9   *Serial Asynchronous Automatic Dialing and Control for Character Mode DCE on Wireless Data Services - Annex L: CDPD Commands*

10   Radio Control Protocol (RCP), APCO Project 25 (TIA)

11   IP Mobility Support (RFC 2002)

12   SLIP Protocol Specification (RFC 1055)

13   PPP Protocol Specification (RFC 1661)

14   Van Jacobson Header Compression Specification (RCS 1144)

15   GSM Standard 07.07

16   Unimodem Diagnostics Command/Draft Reference Specification Revision 0.86

1.4   Open Issues/Known Problems

There are some known problems and open issues at the time of this printing. The following is a list of sections which describe them.

Section 5.1, "Data Transfer Rate," on page 13

2 Referenced Protocols And Standards

2.1 TIA/EIA-602

TIA/EIA-602 (commonly known as the Hayes AT command set) defines messages and procedures which allow a DTE to control the dialing, answering, and modem services of a DCE. The messages consist of async ASCII (readable) characters and are sent "in-band" between the DTE and DCE (i.e. over the same interface used to transfer the data).

2.2 ANSI/TIA/EIA-615

This standard specifies the syntax for commands based on the "+" prefix.

2.3 PC98

PC98 is set of design guidelines and benchmarks, published by Microsoft Corporation. They are to be used as a guideline for making design decisions, to maximize benefit, satisfaction, and ease of use.

The iDEN DCE is not currently compliant with all aspects of these recommendations.

Note that as a wireless modem, the iDEN DCE is not required to support Class 1 fax. Also note that the PC98 design specifications list Class 2.0 fax as recommended, but makes no mention of Class 2 fax. Currently, iDEN supports Class 2 fax, which is a separate standard from Class 2.0.

2.4 SP2388

The interface used for fax operation is based on the August 1990 draft of SP2388 (Class 2 fax). This is an async DTE/DCE interface which defines extensions to EIA-602 that support Group 3 fax transmission.

The fax DTE creates and interprets the T.4 compressed image data. The fax DCE provides dialing, answering, and modem functions, and also terminates the T.30 fax control protocol. Class 2 also makes provisions for the DCE to answer a normal (non-fax) data call and revert to operation as a data modem; this feature proves to be very useful in iDEN.

2.5 PCCA draft standard STD-101

The interface used for iDEN Packet Data is based on PCCA draft standard STD-101 (reference 6), annex F (reference 7), and annex L (reference 9). The wireless extension interface is intended to resolve the packet data problems in link-level framing, address assignment, routing, authentication and compatibility. The CDPD extensions are included for maximum compatibility with CDPD third-party applications.

All mandatory commands in the standard (including annex F and annex L) are supported. At the time of this writing, these PCCA standards have not been completely finalized. Therefore, future changes to these standards before their publications may impact the compliance of this standard. This Interface is based off of PCCA publications as of 1/1/98.

2.6   GSM 07.07

The GSM 07.07 is used as a supplementary command set. Complete adherence to the standard is not achieved due to architectural differences between iDEN and GSM.

The mandatory commands which are not supported are listed below. Some optional commands are supported, but many are not.

- +CRLP   Specify RLP Parameters
- +CRC   Extended RING indications
- D   Dial - Partial compliance (the ";" terminator is supported in a fashion that is incompatible with GSM 07.07)

2.7   SLIP/CSLIP/PPP

In the iDEN Packet Data Network, the Point-to-Point Protocol (PPP), Serial Line Internet Protocol (SLIP), and Compressed Serial Line Internet Protocol (CSLIP) are supported by the Mobile Station (DCE) to provide a means to frame datagrams over the serial port. As a result, there are no iDEN-specific device drivers that are needed for a mobile node to access the iDEN Packet Data Network through the Mobile Station.

The Mobile station acts as the server for the SLIP/CSLIP/PPP connection.

Throughout this document, all references to SLIP should be interpreted as applying to CSLIP as well.

2.7.1   Escaping to Command Mode from SLIP/PPP

If a SLIP/PPP connection has been established and the DTE attempts to escape to an online command mode, the SLIP/PPP connection will terminate.

3 Overview of Data Services

3.1 Circuit Switched Data

The Mobile Station (MS) and the iDEN network interact to provide the DTE with a circuit-switched data interface with the PSTN. In this manner, the DTE may use the MS as a modem which understands the AT command set described in the TIA/EIA-602 standard.

3.2 Facsimile

This section describes the DTE/DCE interface used to provide Class 2 fax transmission on an iDEN circuit-switched channel. The interface is based on EIA/TIA draft standard SP2388 (reference 5 Asynchronous Facsimile DCE Control Standard Draft EIA standard, August 1990 (SP2388)). Frequent references are made to that standard and in many cases only differences from the standard are discussed here.

In Class 2, the DTE produces and interprets the T.4 compressed image data. The T.30 fax control protocol, modem functions, dialing, and answering are handled by the DCE. The Class 2 DTE/DCE interface defines a set of DTE commands and DCE responses which allow the fax DTE to control the DCE's operation. These commands and responses are passed "in band" between the DTE and DCE.

The Class 2 services are as defined in reference 4, except:
•Error correction mode (ECM) is not supported
•Polled transmission and reception is not supported
•Block mode Phase C transfer is not supported
•Copy quality checking is not performed
•Procedure interrupts are not allowed
•Non-standard facilities (NSF) are not supported

The unsupported features are mostly optional parts of the standard and are not required by commonly available DTE implementations. These features have been disabled by restricting the values of certain parameters in ways which, for the most part, are permitted by the specification.

3.3 Voice Services

The DTE/DCE Interface allows the DTE to initiate an interconnect (voice) call from the iDEN subscriber unit. In order to accomplish this, the WDS-side-stack must be set to Circuit Data (+WS46=23) and the service class must be set to Voice (+FCLASS=8 or #CLS=8). Any subsequent dial strings will be interpreted as requests for voice interconnect service.

3.4 Packet Switched Data

iDEN Packet Data provides wireless datagram-based networking on the iDEN network. Based on the TCP/IP protocol suite, iDEN Packet Data provides a mobile transport layer connecting the mobile node to an internet.

This section describes how the DTE/DCE interface interacts with the iDEN system in order to provide wireless connectivity to an internet.

3.4.1 Mobile-IP

Unlike stationary nodes on land-based data networks, no assumptions can be made as to the physical location of a Mobile Node (MN). This presents a problem for nodes on an internet that want to be mobile and yet still communicate using IP. The difficulty is due to the fact that the IP address itself is used determine the location of the node much like the address on a letter is used. The problem, therefore, is how to overcome this static addressing mechanism of IP for mobile devices.

Mobile-IP is an Internet Engineering Task Force (IETF) recommendation that specifies how mobile nodes can change where they connect to the network and thereby provide a way for an IP device to be truly mobile. Mobile-IP permits mobile nodes to inform a 'visited' network that it is present and then arrange to have its home network forward data to it automatically.

This capability is provided through the use of specialized devices called Home Agents (HA) and Foreign Agents (FA). A Home Agent resides in the MN's home network. A Foreign Agent resides in the foreign network that the MN is visiting. When a MN travels out of its home network to a foreign network, it informs its Home Agent that it is no longer located in its home network (and tells the Foreign Agent that it is presently in the FA's network) by sending a Registration Request to its Home Agent. To do this, the MN must first direct the Request to the FA which then forwards the Request to the MN's Home Agent.

When the Home Agent receives this request, all messages destined for the MN are intercepted by the Home Agent and forwarded to the foreign network where the MN is currently located. The original messages, including the original IP header, are encapsulated in a new IP datagram that is addressed to the current MN's FA. This process is known as "tunneling" and the IP message is said to be doubly encapsulated. When the FA receives a message that is destined to the visiting MN, the new header is stripped off (or "de-tunneled") and the original message is delivered to the MN. This process is usually described in the following terms: "IP datagrams that arrived at the MN's home network and are destined to the MN are tunneled by the Home Agent to the Foreign Agent. The FA de-tunnels the message and then delivers the message in its original from to the mobile node." The depiction in Figure 1 shows how datagrams are sent from some host in the internet. The diagram also indicates the path that is taken by datagrams sent by the remote located MN to some node resident in the internet.

Figure 1.   IP Datagram Pathway for Datagrams Delivered to and Sent from a MN

3.4.2   Link Access Protocol - iDEN (LAPi)

LAPi is the over the air protocol used to send data reliably over the air interface. The protocol quickly and efficiently transmits IP packets by dividing packets into smaller blocks of data. The protocol then sends one or more blocks in each of the time slots that make up the iDEN TDMA air interface. If an error occurs in one of the blocks that are sent over the air, then only that smaller piece of the larger packet needs to be retransmitted. These kinds of optimizations account for much of the high level of performance that iDEN Packet Data provides.

3.4.3   Critical Packet Data Parameters

Some AT commands set parameters that are crucial to the integrity of the packet data connection. For example, the IP addresses of point-to-point connections are considered critical, as are the various authentication parameters. In order to insure the integrity of each connection, the DCE will apply a short set of rules to these critical values and the AT commands that set them.

3.4.3.1   Changing Critical Data

If the DTE changes critical data parameters during the establishment of a packet data connection, that connection will be aborted.

3.5   Radio Communications

This mode is not a data service in the conventional sense. Radio Communications Mode is used by the DTE when it wishes to communicate with the DCE, as opposed to communicating over the air.

This can be very useful as a testing tool for developers who are writing applications while not located within a Packet Data service area. The application may be tested using a "radio communications" setting instead of "Packet Data" for the WDS-side stack (+WS46). Since the SLIP and PPP clients used for radio communications are the same as those used for over-the-air packet data, call establishment and SLIP/PPP compatibility may be tested independent of the Packet Data network.

This communication can occur over SLIP, PPP, or TMDL. SLIP and PPP require a client running on the DTE, sending IP packets to the DCE's IP address (set by AT+WV304). TMDL is a proprietary protocol very similar to Bisync.

3.5.1   TMDL Establishment

TMDL communication may be established by sending <DLE><STX> while the DCE is in command mode. In this case, no result code will be returned to the DTE before establishment. This is included as part of the interface in order to support legacy test applications, and is not intended for future application development. In order for these legacy applications to function correctly with the DCE, autobaud must be disabled (through the +IPR command or the *#60 menu), and auto detection of character framing must be disabled, and set to 8N1 (through +ICF). It is also desirable (although not required) to disable local echo (using the E command).

TMDL may also be established through the more traditional AT command interface using the Dial command (ATD). This method has the advantage of being co-existing with autobaud and automatic framing detection. Before this type of connection may be established, you must configure your DTE-side and WDS-side stacks appropriately. See Section 6, "Transitioning Data Services," on page 15 and Section 8.4, "Service Selection Commands," on page 48 for more information.

4 DTE/DCE Overview

Figure 2.   Illustration of the DTE/DCE And Their Interfaces

4.1 Data Terminal Equipment (DTE) Overview

4.1.1 Circuit Data

A DTE is a data terminal. In practice, the DTE is usually a PC running a communications application.

4.1.2 Facsimile

A Fax DTE is a DTE which is capable of generating and receiving T.4 image data and of controlling a Fax DCE. A Fax DTE is typically contained within a Fax Machine or a PC running a Fax application.

4.1.3 Packet Data

An iDEN Packet Data DTE is a device capable of a PPP/SLIP/CSLIP connection over an asynchronous serial interface.   A more in-depth discussion of the properties and requirements of an iDEN Packet Data DTE may be found in "Packet Switched Data" on page 6.

4.2 Data Communications Equipment (DCE) Overview

In iDEN, the functions normally associated with the DCE are distributed into several system elements.   For the sake of simplicity, throughout this document the MS will be referred to as the DCE.

4.2.1 Circuit Data

A circuit data DCE is a device (i.e. a modem) which interfaces the DTE and a communications network (e.g. the PSTN). In the iDEN Network, a Circuit Data DCE is the iDEN Mobile Station, which provides the Service Class 0[1] services.

1.Service Class 0 (class 0) refers to the DCE services which provide for the transfer of async data.

4.2.2 Facsimile

The Fax DCE interfaces a Fax DTE to the PSTN and allows it to communicate with a remote Group 3 Fax machine. In the iDEN Network, a Circuit Data DCE is the iDEN Mobile Station, which provides the Service Class 2^{1*} services.

4.2.3 Packet Data

A DCE in the iDEN Packet Data Network is the Mobile Station (a Packet Data-capable iDEN Subscriber Unit). The DCE uses a PPP/SLIP/CSLIP connection for communication with the DTE, and LAPi for the over-the-air data connection.

4.3 DTE/DCE Interface

4.3.1 Physical Interface

This document does not specify the physical connection to be used at the interface. However, it is recommended that the DCE present a standard or commonly used DCE interface to the DTE (e.g. female DB-9 or DIN8 connector).

4.3.2 Interchange Circuits

Due to physical hardware limitations within early iDEN Circuit Data capable subscriber units, a 4-pin interface is defined (in addition to EIA-232 E). This document assumes the EIA-232 E standard, and only notes the changes required for 4-pin support as exceptions to this standard.

4.3.2.1 9-pin EIA-232 E Interface

The interchange circuits between the DTE and DCE are listed in table Table 1 on page 12. The definitions of these circuits may be found in reference 6 Interface Between Data Terminal Equipment and Data Circuit Terminating Equipment Employing Serial Binary Data Interchange (EIA/TIA-232-E).

4.3.2.2 4-pin subset of EIA-232 E Interface

In the 4-pin implementation, only the GND, TD, RD, RFR, and CTS pins are supported (GND is an "active" pin, so it does not count as one of the four). As a result, the commands that depend upon information regarding other pins will have no effect upon radio operations. In particular, the &C and &D commands are affected.

An important note is that flow control is active while the DCE is in command mode. If the SU is configured for hardware flow control (the default) then communication between the DTE and DCE over a 4-pin interface will be inhibited.

1.*Service Class 2 (class 2) refers to the DCE services which provide for the transfer of facsimile data.

TABLE 1. **9-Pin & 4-Pin Interchange circuits**

V.24	RS-232-E	Name	9-PIN Direction	4-PIN Direction
102	AB	Ground	-	-
103	BA	Transmitted Data (TD)	DTE -> DCE	DTE -> DCE
104	BB	Received Data (RD)	DCE -> DTE	DCE -> DTE
133	CJ	Ready For Receiving (RFR)	DTE -> DCE	DTE -> DCE
106	CB	Clear To Send (CTS)	DCE -> DTE	DCE -> DTE
108/2	CD	Data Terminal Ready (DTR)	DTE -> DCE	Not Monitored
107	CC	Data Set Ready (DSR)	DCE -> DTE	Reflects DTR
109	CF	Data Carrier Detect (DCD)	DCE -> DTE	Reflects DTR
125	CE	Ring Indicator (RI)	DCE -> DTE	Never Active

5 DTE/DCE Communication

5.1 Data Transfer Rate

The DTE/DCE data rate (not to be confused with the DCE/FNE data rate) is set by the DTE-DCE data rate control command (see Section 8.3.7).

When the DCE uses the factory default setting (Autobaud enabled), the DCE automatically determines the DTE/DCE data transfer rate. When the data rate is determined automatically, the character framing is also determined automatically.

5.1.1 Known Autobaud Issues

The Autobaud feature (enabled through the *#60 programming menu or the +IPR=0 AT command, may require a "retry" of the first AT command following a baud rate change. A retry is needed if no response is returned from the DCE.

5.2 Character Framing

When in Command or On-line Command modes (and the Data Transfer Rate is not automatically determined by the DCE), communication is framed in accordance with the value of the +ICF parameter (see Section 8.3.4). When in data transfer mode, the character framing is transparent to the DCE and must be negotiated between the DTE and the remote connection.

When the DTE/DCE data rate is determined automatically by the DCE, the value of the +ICF parameter is ignored, and the character framing is determined automatically as well.

When the DCE uses the factory default setting (+ICF=0,0), the DCE automatically determines the character framing.

If a DCE does not support the +ICF command, then the character framing will be determined automatically.

5.3 Flow Control

The DTE/DCE flow control is determined by the +IFC and the &K commands.

Some older DCE models support the &K command, while newer models support the +IFC command. In models were both commands are supported, special attention should be paid to these commands, as the two commands affect each other's settings.

An important note is that flow control is active while in command mode. This allows us to reliably send extended AT command responses without data loss, but may cause communications problems if a developer is not aware of the behavior.

5.4   Response Timing

When an AT command line is sent from the DTE to the DCE, the DTE will usually wait for a response from the DCE before issuing the next command.

For all non-call control commands (such as ATA and ATD), the DTE may expect the first character of the response to be sent within 1 second of the command line's termination. Subsequent characters will follow with no greater than 100 milliseconds of idle time between them.

Call control commands have their own timing requirements, based upon time-out parameters set by AT commands (such at the S7 register for circuit data calls and the +WS198 command for packet data connections).

6 Transitioning Data Services

Aside from the buttons and displays found on the Mobile Station, there are two interfaces to the DCE; the serial port and the antenna. Since the iDEN Mobile Station is configured to operate within several different classes of data networks (such as LAPi, Circuit Data, Fax), these two ports must also be configured to correspond with the desired network class. For the sake of a naming convention, the stack that interacts with the serial port is the DTE-Side Stack and the stack that interacts with the antenna is the WDS-Side Stack.

6.1 Data Service Selection

The Data Service Selection commands (+FCLASS, +WS45, and +WS46) are used to select a data service. These commands may only be issued while the DCE is in command mode (not while in On-line Command Mode). If an invalid stack selection is requested, the ERROR result code will be returned (see Section 6.2).

TABLE 2

Data Service	WDS-Side Stack	DTE-Side Stack	Service Class
Circuit Switched Data	iDEN Circuit Data	Transparent Character Stream	0
Facsimile	iDEN Circuit Data	Transparent Character Stream	2
Packet Data	iDEN Packet Data	PPP	0
		SLIP	0
Radio Communications	Local Data Services	TMDL	0
		PPP	0
		SLIP	0
Telephone Interconnect	iDEN Circuit Data	Transparent Character Stream	8

6.2 Data Service Selection Interactions

The DCE recognizes an overlap in the definitions of the +FCLASS, +WS45, and +WS46 commands. To resolve these conflicts, a documented approach must be taken when using these parameters.

6.2.1 Setting the WDS-Side stack

Whenever the +WS46 parameter is changed, the value of the +FCLASS parameter is set to an appropriate service class, and the +WS45 parameter is set to the default DTE-side stack for the newly selected WDS-side stack.

6.2.2 Setting the DTE-Side Stack

Whenever the DTE requests a change to the DTE-side stack parameter, the DCE first verifies that the new setting is valid, given the current value of setting of the WDS-Side stack. If the value is not valid, the ERROR result code is returned.

6.2.3 Setting the Service Class

Whenever the DTE changes to the +FCLASS parameter, the DCE verifies that the requested service class is appropriate given the current WDS-Side stack specified by the +WS46 parameter. If a conflict is detected, the ERROR code is returned. Otherwise, the service class is selected and the +WS45 parameter is set to the default DTE-side stack for the newly selected service class.

7 Command Syntax

The format of a command line is unchanged from the standard format described in reference 7. The following descriptions are meant to define the command classifications, as they are used throughout this document. The syntax for each command is given in the individual command descriptions in Section 8.

7.1 Execute

The Execute syntax is used when a command is to be executed. The command may or may not have required parameters.

An example of a properly formatted command line containing a theoretical command +X with this syntax is:

AT+X1

7.2 Query

The Query syntax is used when a the DTE wishes to know the current value of a parameter.

An example of a properly formatted command line containing a theoretical command +X with this syntax is:

AT+X?

7.3 Set

The Set syntax is used when a parameter is to be set.   The syntax for each command is given in the individual command descriptions in Section 8.

The Query syntax is used when the DTE wishes to know the current value of a parameter.

An example of a properly formatted command line containing a theoretical command +X with this syntax is:

AT+X=1

7.4 Range

The Range syntax is used when the DTE either wishes to test the validity of a command parameter, or to test for the support of the command itself. For instance, the DTE may issue a command knowing that if the ERROR response is returned then the command is not supported by the DCE.

 The Query syntax is used when a the DTE wishes to know the current value of a parameter.

An example of a properly formatted command line containing a theoretical command +X with this syntax is:

AT+X=?

8 Supported AT Commands

Table 3: Call Control Commands

	AT Command		L	O	C	B	Refer To:
A	Answer	Section 8.1.1	N	N	N	N	EIA-602
D	Dial	Section 8.1.2	N	N	N	N	EIA-602
H	Hookswitch Control	Section 8.1.3	N	Y	N	N	EIA-602
O	Go On-Line	Section 8.1.4	N	Y	N	N	EIA-602
S0	Automatic Answer	Section 8.1.5	N	Y	N	N	EIA-602
S7	Circuit Data Connection Time-out	Section 8.1.6	N	Y	N	N	EIA-602
S30	Idle Time-Out	Section 8.1.7	N	Y	N	N	EIA-602
+WS198	Packet Data Registration Wait Time	Section 8.1.8	N	Y	N	N	Annex L
+WPDEREG	Deregister NEI from Network	Section 8.1.9	N	Y	N	N	Annex L
+WPREG	Register NEI to Network	Section 8.1.10	N	Y	N	N	Annex L

Table 4: Result Code Formatting Commands

	AT Command		L	O	C	B	Refer To:
V	Result Code Format	Section 8.2.1	N	Y	N	N	EIA-602
X	Extended Result Codes	Section 8.2.2	N	Y	N	N	EIA-602
Q	Result Code Control	Section 8.2.3	N	Y	N	N	EIA-602
+CR	Service Reporting Control	Section 8.2.4	N	Y	N	N	GSM 07.07
+ILRR	DTE-DCE Local Rate Reporting	Section 8.2.5	N	Y	N	N	ITU-T V.25.3

Table 5: DTE/DCE Communication Configuration Commands

	AT Command		L	O	C	B	Refer To:
&C	DCD Behavior	Section 8.3.1	N	Y	N	N	EIA-602
&D	DTR Behavior	Section 8.3.2	N	Y	N	N	EIA-602
E	Local Command Mode Echo	Section 8.3.3	N	Y	N	N	EIA-602
+ICF	DTE-DCE character framing	Section 8.3.4	N	Y	N	N	PCCA 101
+IFC	DTE-DCE local flow control	Section 8.3.5	N	Y	N	N	PCCA 101
&K		Section 8.3.6	N	Y	N	N	
+IPR	DTE-DCE data rate control	Section 8.3.7	N	Y	N	N	PCCA 101

Table 6: Service Selection Commands

AT Command			L	O	C	B	Refer To:
#CLS	Service class	Section 8.4.1	N	N	N	N	
+FCLASS			N	N	N	N	PCCA 101
+WS45	Select DTE-side stack	Section 8.4.2	N	N	N	N	PCCA 101
+WS46	Select WDS-side stack	Section 8.4.3	N	N	N	N	PCCA 101
+WS179	On-line Control Preference	Section 8.4.4	N	Y	N	N	Annex L
+CBST	Select Bearer Service Type	Section 8.4.5	N	N	N	N	GSM 07.07

Table 7: User Image Management Commands

AT Command			L	O	C	B	Refer To:
&F	Restore Factory-Default Configuration	Section 8.5.1	N	N	N	N	EIA-602
Z	Restore User Default Configuration	Section 8.5.2	N	N	N	N	EIA-602
&W	Save User Default Configuration	Section 8.5.3	N	Y	N	N	
&V	View Stored Parameters	Section 8.5.4	N	Y	N	N	
&Y	Select Power-Up User Profile	Section 8.5.5	N	Y	N	N	

Table 8: Product Information Commands

AT Command			L	O	C	B	Refer To:
I	Return Product Information	Section 8.6.1	Y	Y	N	N	EIA-602
+FREV	Request DCE revision	Section 8.6.2	Y	Y	N	N	Class 2 Fax
+GMR			Y	Y	N	N	PCCA 101
+CGMR			Y	Y	N	N	GSM 07.07
+FMDL	Request DCE model	Section 8.6.3	Y	Y	N	N	Class 2 Fax
+GMM			Y	Y	N	N	PCCA 101
+CGMM			Y	Y	N	N	GSM 07.07
+FMFR	Request DCE manufacturer	Section 8.6.4	Y	Y	N	N	Class 2 Fax
+GMI			Y	Y	N	N	PCCA 101
+CGMI			Y	Y	N	N	GSM 07.07
+CGSN	Request DCE Serial Number	Section 8.6.5	Y	Y	N	N	GSM 07.07
+GSN			Y	Y	N	N	GSM 07.07

Table 9: Connection/Communication Diagnostic Commands

	AT Command		L	O	C	B	Refer To:
+CEER	Extended Error Code Report	Section 8.7.1	Y	Y	N	N	GSM 07.07
#UD	Unimodem Diagnostics	Section 8.7.2	N	Y	N	N	Microsoft
+CBC	Battery Status	Section 8.7.3	N	Y	N	N	GSM 07.07
+WS53	Signal quality	Section 8.7.4	N	Y	N	N	Annex F
+WS50	Signal strength	Section 8.7.5	N	Y	N	N	Annex F
+WPSTATE	Display PD Status Information	Section 8.7.6	N	Y	N	N	Annex L
+WPCHANINFO	Display Channel Information	Section 8.7.7	N	Y	N	N	Annex L

Table 10: Standard Compatibly Commands

	AT Command		L	O	C	B	Refer To:
+WCXF	PCCA miscellaneous commands	Section 8.8.1	Y	Y	N	N	Annex F
+W	PCCA wireless/wireline extensions	Section 8.8.2	Y	Y	N	N	PCCA 101
+WCXS	iDEN specific commands	Section 8.8.3	Y	Y	N	N	
+WCXL	CDPD Commands	Section 8.8.4	Y	Y	N	N	Annex L

Table 11: Packet Data Configuration Commands

	AT Command		L	O	C	B	Refer To:
+WV304	DCE IP address	Section 8.9.1	N	Y	Y	Y	
+WS175	Packet Data Session Timer	Section 8.9.2	N	Y	N	N	Annex L
+WV312	SLIP MTU setting	Section 8.9.3	N	Y	N	N	
+WV300	DCE Mobile IP Control	Section 8.9.4	N	Y	Y	Y	
+WV301	MIP Authentication Key	Section 8.9.5	N	Y	Y	Y	
+WV302	MIP Registration Lifetime	Section 8.9.6	N	Y	Y	Y	
+WPNEI	DTE IP Address	Section 8.9.7	N	Y	Y	Y	Annex L
+WV305	MIP Home Agent address	Section 8.9.8	N	Y	Y	Y	
+WV309	MIP Security Parameter Index	Section 8.9.9	N	Y	Y	Y	
+WV310	Request Broadcast Datagrams	Section 8.9.10	N	Y	Y	Y	
+WV311	Mobile Node IP Prefix Length	Section 8.9.11	N	Y	Y	Y	
+WS182	TCP Header Compression	Section 8.9.12	N	Y	Y	N	Annex L
+WS196	OTA IP Data Compression	Section 8.9.13	N	Y	N	N	Annex L
+WV308	Network Air-link Encryption	Section 8.9.14	N	Y	Y	N	
+WV324	DNS IP Address	Section 8.9.15	N	Y	N	Y	

Table 12: DTE/DCE Lock/Unlock Commands

	AT Command		L	O	C	B	Refer To:
+WCLK	Lock/unlock DCE	Section 8.10.1	Y	N	N	N	Annex F
+WCPN	Set PIN to lock/unlock DCE	Section 8.10.2	N	N	N	N	Annexes

Table 13: Class 2 Fax Commands

	AT Command		L	O	C	B	Refer To:
+FAA	Adaptive Answer	Section 8.11.1	N	Y	N	N	Class 2 Fax
+FAXERR	Fax error code	Section 8.11.2	N	Y	N	N	Class 2 Fax
+FBUF	Buffer size	Section 8.11.3	N	Y	N	N	Class 2 Fax
+FCR	Capability To Receive	Section 8.11.4	N	Y	N	N	Class 2 Fax
+FDCC	DCE capabilities	Section 8.11.5	N	Y	N	N	Class 2 Fax
+FDR	Receive Phase C data	Section 8.11.6	N	Y	N	N	Class 2 Fax
+FDT	Transmit Phase C data	Section 8.11.7	N	Y	N	N	Class 2 Fax
+FDIS	Current session parameters	Section 8.11.8	N	Y	N	N	Class 2 Fax
+FDCS	Current session results	Section 8.11.9	N	Y	N	N	Class 2 Fax
+FET	Transmit Page Punctuation	Section 8.11.10	N	Y	N	N	Class 2 Fax
+FK	Session termination	Section 8.11.11	N	Y	N	N	Class 2 Fax
+FPTS	Page transfer status	Section 8.11.12	N	Y	N	N	Class 2 Fax
+FLID	Local ID String, TSI/DSI	Section 8.11.13	N	Y	N	N	Class 2 Fax
+FCIG	Local Polling ID String	Section 8.11.18	N	Y	N	N	Class 2 Fax
+FBOR	Data Bit Order	Section 8.11.16	N	Y	N	N	Class 2 Fax
+FBADLIN	Bad Line Threshold	Section 8.11.14	N	Y	N	N	Class 2 Fax
+FBADMUL	Error Threshold Multiplier	Section 8.11.15	N	Y	N	N	Class 2 Fax
+FBUG	Session Message Reporting	Section 8.11.17	N	Y	N	N	Class 2 Fax
+FCQ	Copy Quality Checking	Section 8.11.19	N	Y	N	N	Class 2 Fax
+FCTCRTY	ECM Retry Count	Section 8.11.20	N	Y	N	N	Class 2 Fax
+FDFFC	Compression Format Conversion	Section 8.11.21	N	Y	N	N	Class 2 Fax
+FECM	Error Correction Mode Control	Section 8.11.22	N	Y	N	N	Class 2 Fax
+FLNFC	Page Length Format Conversion	Section 8.11.23	N	Y	N	N	Class 2 Fax
+FLPL	Indicate Document to Poll	Section 8.11.24	N	Y	N	N	Class 2 Fax
+FMINSP	Minimum Phase C Speed	Section 8.11.25	N	Y	N	N	Class 2 Fax
+FPHCTO	DTE Phase C Response Time-out	Section 8.11.26	N	Y	N	N	Class 2 Fax
+FRBC	Phase C Receive Data Block Size	Section 8.11.27	N	Y	N	N	Class 2 Fax
+FREL	Phase C Received EOL Alignment	Section 8.11.28	N	Y	N	N	Class 2 Fax
+FSPL	Request to Poll	Section 8.11.29	N	Y	N	N	Class 2 Fax

Table 13: Class 2 Fax Commands

AT Command			L	O	C	B	Refer To:
+FTBC	Phase C Transmit Data Block Size	Section 8.11.30	N	Y	N	N	Class 2 Fax
+FVRFC	Vertical Resolution Conversion	Section 8.11.31	N	Y	N	N	Class 2 Fax
+FWDFC	Page Width Format Conversion	Section 8.11.32	N	Y	N	N	Class 2 Fax

Table 14: Compatibility Commands

AT Command			L	O	C	B	Refer To:
P	Select Pulse Dialing	Section 8.12.1	N	Y	N	N	EIA-602
T	Select Tone Dialing	Section 8.12.2	N	Y	N	N	EIA-602
L	Monitor Speaker Volume	Section 8.12.3	N	Y	N	N	EIA-602
M	Monitor Speaker Mode	Section 8.12.4	N	Y	N	N	EIA-602
+WCHG	Battery Charging Status	Section 8.12.5	N	Y	N	N	Annex F
+WS52	Battery level	Section 8.12.6	N	Y	N	N	Annex F
+CSQ	Signal Status	Section 8.12.7	N	Y	N	N	GSM 07.07
+WS56	Registration status	Section 8.12.8	N	Y	N	N	Annex F
+WS58	Low Power State	Section 8.12.9	N	Y	N	N	Annex F
S2	Escape Code Character	Section 8.12.10	N	Y	N	N	EIA-602
S3	Command Line Terminator	Section 8.12.11	N	Y	N	N	EIA-602
S4	Response Format	Section 8.12.12	N	Y	N	N	EIA-602
S5	Command Line Edit	Section 8.12.13	N	Y	N	N	EIA-602
S6	Pause Before Blind Dial	Section 8.12.14	N	Y	N	N	EIA-602
S8	Comma Dial Modifier Time	Section 8.12.15	N	Y	N	N	EIA-602
S9	Carrier Detect Response Time	Section 8.12.16	N	Y	N	N	EIA-602
S10	Automatic Disconnect Delay	Section 8.12.17	N	Y	N	N	EIA-602
S12	Escape Code Timer	Section 8.12.18	N	Y	N	N	EIA-602
+WPSERVICE	Display Service	Section 8.12.19	N	Y	N	N	Annex L
+WPNEILIST	List all Network Entity Identifiers	Section 8.12.20	N	Y	N	N	Annex L
+WPEID	Display Electronic Identification	Section 8.12.21	N	Y	N	N	Annex L
+WPRSSI	Display RSSI/Channel State	Section 8.12.22	N	Y	N	N	Annex L
+WPREGSTATE	Display Registration State	Section 8.12.23	N	Y	N	N	Annex L
+WS173	Registration Control	Section 8.12.24	N	Y	N	N	Annex L
+WS181	Service Preference	Section 8.12.25	N	Y	N	N	Annex L
+WS197	NEI Index	Section 8.12.26	N	Y	N	N	Annex L
+CMEE	Report Equipment Error	Section 8.12.27	N	Y	N	N	GSM 07.07
+GCAP	Request DCE Capabilities	Section 8.12.28	N	Y	N	N	GSM 07.07

Table 15: DCE Capability Commands

AT Command			L	O	C	B	Refer To:
+WV320	TPD/UPD Blocking	Section 8.13.1	N	Y	N	N	
+WV322	Bootstrap Data Lock	Section 8.13.2	N	Y	N	N	
+WV323	UPD Auto-Start	Section 8.13.3	N	Y	N	N	

Table 16: UP Link Configuration Commands

AT Command			L	O	C	B	Refer To:
+WV313	UPLink Net1 Configuration	Section 8.14.1	N	Y	N	N	
+WV314	UPLink Net2 Configuration	Section 8.14.2	N	Y	N	N	
+WV315	UPLink Net3 Configuration	Section 8.14.3	N	Y	N	N	

8.1   Call Control Commands

8.1.1   Answer

If an incoming (decoded) data service is pending, this command instructs the DCE to immediately connect to the call and start the answer sequence, as appropriate for the selected service.

Operator	Syntax
Execute	A

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
CONNECT	X			
ERROR	X	X	X	X
NO CARRIER	X			
OK	X			

8.1.2 Dial

This command instructs the DCE to originate a connection using the currently selected data service.

Operator	Syntax
Execute	D[<Dial String>][;]

Range Response	Value Response	Default values

- Packet Data

If the **Select DTE-side stack** command has activated a SLIP or PPP connection and the **Select WDS-side stack** command has selected iDEN Packet Data, then the contents of the Dial String are ignored.

- Circuit Data

All non-numeric characters in the Dial String that are not recognized dial-modifiers are ignored. This allows the DTE to request phone numbers containing unsupported dial modifiers, hyphens, parenthesis, and other punctuation.

Dial Modifiers:

T	Allowed, but ignored by the DCE.
P	Allowed, but ignored by the DCE.
!	The equivalent of pressing the hook control switch for 1/2 second on many of today's telephone systems.
W	Wait for time specified in S7 for dial tone before continuing execution of dial string.
@	Wait for time specified in S7 for one or more rings followed by 5 seconds of silence before continuing execution of dial string.
,	Pause for time specified in S8 before continuing execution of dial string.
;	After dialing return to command mode.
S=x	Dials a pre-programmed dial string. This dial modifier may follow the T or P Dial modifiers, but may not follow any other Dial Modifier or dialing digit. They are defined as follows: S=0 Read user image 0 and dial (empty dial string) S=1 Read user image 1 and dial (empty dial string) S=2 Read user image 2 and dial (empty dial string)

NOTE: In order to support some fancy dialing options, the iDEN DCE will effectively ignore empty dial strings that terminate in a semicolon. Examples of such dial strings are: ATD; and ATDT;. If they are the lone commands on a command line, then a simple "OK" result code will be returned. If they are followed by additional commands, then those commands will be executed. For example, the command line ATD;E0 is equivalent to ATE0, and ATD;Z2D is equivalent to ATZ2D.

Possible Responses

Message Name	Execute	Query	Set	Range
CONNECT	X			
ERROR	X	X	X	X
NO CARRIER	X			
BUSY	X			
NO ANSWER	X			
NO DIALTONE	X			
OK	X			

8.1.3   Hookswitch Control

This command instructs the DCE to terminate an ongoing call or service.

Operator	Syntax
Execute	H[0]

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR	X	X	X	X
OK	X			

8.1.4   Go On-Line

This command causes the DCE to enter the On-Line state from the On-Line command state.

Operator	Syntax
Execute	O[0]

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
CONNECT	X			
ERROR	X	X	X	X
NO CARRIER	X			
OK	X			

8.1.5   Automatic Answer

The value in S0 determines whether DCE will automatically answer an incoming (land-to-mobile) call. If Automatic Answer is enabled, then the DCE will answer without any action by the DTE. If Automatic Answer is disabled, the DCE will not answer the call (however, it will send the RING response code to the DTE, and then DTE may then issue an ATA command to answer the call).

NOTE: The operation of this command may be further affected by the DTR Behavior (Section 8.3.2) command.

Operator	Syntax
Set	S0=<Automatic Answer>
Query	S0?

Defined Automatic Answer Values

0   Disable Automatic Answer.
1-255   Enable Automatic Answer, answer on the "nth" ring.

Range Response	Value Response	Default values
(0-255)	<Automatic Answer>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.1.6   Circuit Data Connection Time-out

This parameter specifies how may seconds the IWF will wait for a connection with the remote DCE before terminating the attempt.

Operator	Syntax
Set	S7=<Connection Timer>
Query	S7?

Defined Connection Completion Timer Values

1-255   Connection Completion Time-out (Seconds)

Range Response	Value Response	Default values
(1-255)	<Connection Completion Timer>	120

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.1.7   Idle Time-Out

In this command S30 specifies an idle line time-out for on-line data mode. If no data is sent by the DTE on the transmit data line for the specified period of time, the DCE disconnects the call, returns the OK result code, and returns to command mode.

Operator	Syntax
Set	S30=<Idle Time-Out>
Query	S30?

Defined Idle Time-Out Values

0	No Time-Out
1-255	Idle Time-Out (Seconds)

Range Response	Value Response	Default values
(0-255)	<Idle Time-Out>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.1.8   Packet Data Registration Wait Time

This command allows the DTE to specify a maximum amount of time to wait for Packet Data Registration.

Although the current supported range is very flexible, the DTE should allow at least 10 seconds for registration.

Operator	Syntax
Query	+WS198?
Range	+WS198=?
Set	+WS198=<Connection Completion Timer>

Defined Connection Completion Timer Values
1-255   Connection Completion Time-out (Seconds)

Range Response	Value Response	Default values
(1-255)	<Connection Completion Timer>	30

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.1.9   Deregister NEI from Network

This command de-registers the NEI from the Network. In IDEN, this means that the DCE will De-Register Packet Data from the system. Given the absence of an online command mode for packet data, this command is useful for terminating untethered packet data sessions only.

Operator	Syntax
Execute	+WPDEREG
Range	+WPDEREG=?

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR		X	X	
OK	X			X

8.1.10   Register NEI to Network

This command tells the DCE to register the NEI with the network. In iDEN, this means that the DCE will register packet data with the settings in the current user profile. The session will be untethered, so PPP and SLIP will remain inactive.

Operator	Syntax
Execute	+WPREG
Range	+WPREG=?

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR		X	X	
OK	X			X

8.2   Result Code Formatting Commands

8.2.1   Result Code Format

This command sets the user's preference of result code format.

Using this command, the DTE may select Terse or Verbose result codes.

The effects of these settings on each individual result code are discussed Section 9.

Operator	Syntax
Execute	V\<Result Code Format\>

Defined Result Code Format Values

0   Use terse result codes.

1   Use verbose result codes.

Range Response	Value Response	Default values
		1

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.2.2   Extended Result Codes

This parameter controls the format of the result codes sent by the DCE.

The effects of these settings on each individual result code are discussed in the individual response descriptions in Section 9.

Operator	Syntax
Execute	X<Extended Result Code>

Defined Extended Result Code Values

0-1   The DCE does not return the BUSY or NO DIALTONE result codes.

2   The DCE may return the NO DIALTONE result code if appropriate but does not return the BUSY result code.

3   The DCE may return the BUSY result code if appropriate but does not return the NO DIALTONE result code.

4   The DCE may return either BUSY or NO DIALTONE result codes if appropriate.

The format of the CONNECT result code is not affected by this parameter.

Range Response	Value Response	Default values
		4

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.2.3   Result Code Control

This command controls whether or not result codes are sent to the DTE. If Quiet Mode is disabled, then the result codes may be further modified by the **Result Code Format** and **Extended Result Codes** commands.

The effects of these settings on each individual result code are discussed in the individual response descriptions in Section Section 9.

Operator	Syntax
Execute	Q<Result Code Control>

Defined Result Code Control Values

0   Disable Quiet Mode (result codes are sent to the DTE).

1   Enable Quiet Mode (result codes are not sent to the DTE).

Range Response	Value Response	Default values
		0

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.2.4   Service Reporting Control

This command determines whether or not the intermediate result code +CR: <serv> is returned from the DCE to the DTE. If enabled, the intermediate result code is transmitted at the point during negotiation at which the DTE has determined which speed and quality of serviced will be used, before any error control or data compression reports are transmitted, and before any final result code (such as CONNECT) is transmitted. For a complete description of possible <serv> values, see reference 15.

The use of this command is not recommended unless you are certain that the dialer that will be used with the DCE is expecting this result code. Although the command is required under PC98 recommendations, compatibility problems exist with the many popular dialer programs.

Operator	Syntax
Query	+CR?
Set	+CR=<SRC Mode>
Range	+CR=?

Defined SRC_mode Values
0   Disables Reporting
1   Enables Reporting

Range Response	Value Response	Default values
+CR: (0,1)	+CR: <SRC_mode>	0

Possible Responses

Message Name	Execute	Query	Set	Range
OK			X	
ERROR	X		X	
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		

8.2.5   DTE-DCE Local Rate Reporting

This command controls whether or not the extended-format "+ILRR:<rate>" information text is transmitted from the DCE to the DTE. The <rate> reported shall represent the current (negotiated or renegotiated) DTE-DCE rate. If enabled, the intermediate result codes are transmitted after any modulation, error control, or data compression reports are transmitted, and before any final result code (e.g. CONNECT) is transmitted.

The use of this command is not recommended unless you are certain that the dialer that will be used with the DCE is expecting this result code. Although the command is required under PC98 recommendations, compatibility problems exist with the many popular dialer programs.

Operator	Syntax
Query	+ILRR?
Set	+ILRR=<LLR Mode>
Range	+ILRR=?

Defined DCR_mode Values
0   Disables Reporting
1   Enables Reporting

Range Response	Value Response	Default values
+ILRR: (0,1)	+ILRR: <LRR_mode>	0

Possible Responses

Message Name	Execute	Query	Set	Range
OK			X	
ERROR	X		X	
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		

8.3   DTE/DCE Communication Configuration Commands

8.3.1   DCD Behavior

This parameter determines how the DCD line (circuit 109) relates to the detection of received line signal from the distant end. Changing the parameter will take effect immediately in both the command and on-line command states.

NOTE: In a 4-pin implementation (see Section 4.3.2), this command has no effect upon radio operations.

Operator	Syntax
Execute	&C<DCD Behavior>

Defined DCD Behavior Values

0   DCD always ON.
1   The DCE turns DCD ON to indicate presence of a connection, DCD OFF to indicate loss of connection.

Range Response	Value Response	Default values
		1

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.3.2 DTR Behavior

This parameter determines how the DCE responds when the DTR line (circuit 108 ⁄ 2) is changed from the ON to the OFF condition during on-line data state.

NOTE: In a 4-pin implementation (see Section 4.3.2), this command has no effect upon radio operations.

Operator	Syntax
Execute	&D<DTR Behavior>

Defined DTR Behavior Values

0   DCE ignores DTR.

1   If DTR is turned OFF while in on-line data mode, the DCE returns to command mode and issues the OK result code. The call remains connected. If the currently active service does not support an online command mode, then the call will be terminated.

2   If DTR is turned OFF while in on-line data mode, the DCE disconnects the call and returns the OK result code. If DTR is OFF while in command mode, the DCE will not answer an incoming call, regardless of the setting of Automatic Answer (Section 8.1.5).

Range Response	Value Response	Default values
		2

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.3.3 Local Command Mode Echo

The setting of this parameter determines whether or not the DCE echoes characters received from the DTE during command state and on-line command state.

Operator	Syntax
Execute	E<Echo>

Defined Echo Values

0   Disable command mode character echo.
1   Enable command mode character echo.

Range Response	Value Response	Default values
		1

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.3.4   DTE-DCE character framing

The extended compound parameter is used to determine the local serial port asynchronous data framing.

The auto-bauding control setting of the DTE-DCE data rate control (Section 8.3.7) command will implicitly cause the DCE to auto-detect parity.

Note that if all **8** bits are used for data transmission, then the second parameter is not used.

Operator	Syntax
Query	+ICF?
Set	+ICF=[<Framing>[,<Parity>]]
Range	+ICF=?

If the first parameter is not specified, then the default value of "0" will be assumed.

Defined Framing Values

0	Auto detect
3	8 data bits, 1 stop bit
5	7 data bits, 1 parity, 1 stop bit

Defined Parity Values

0	Odd
1	Even
2	Mark
3	Space

Range Response	Value Response	Default values
+ICF: (0,3,5), (0-3)	+ICF: <Framing>[, <Parity>]	0, 0

Possible Responses

Message Name	Execute	Query	Set	Range
OK			X	
ERROR	X		X	
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		

8.3.5 DTE-DCE local flow control

The extended compound parameter is used to control the local flow control between the DTE and DCE. The two numeric subparameters are DCE_by_DTE (which controls the data from DCE) and DTE_by_DCE (which controls the data from the DTE).

The settings of these parameters may be implicitly changed by the use of the DTE-DCE local flow control (Section 8.3.6) command.

Operator	Syntax
Query	+IFC?
Set	+IFC=<DCE By DTE>,<DTE by DCE>
Range	+IFC=?

Defined Values DCE_by_DTE
0   No flow control set by DTE.
1   XON/XOFF; Do not pass XON/XOFF characters to the remote DCE.
2   RFR active/inactive flow control.
3   XON/XOFF; Pass DC1/DC3 characters to the remote DCE in addition to acting upon local flow control.[1]

Defined Values DTE_by_DCE
0   No flow control set by DTE.
1   XON/XOFF flow control.
2   CTS/RFS active/inactive flow control.

Range Response	Value Response	Default values
+IFC: (0-3), (0-2)	+IFC: <DCE_by_DTE>, <DTE_by_DCE>	2, 2

Possible Responses

Message Name	Execute	Query	Set	Range
OK			X	
ERROR	X		X	
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		

1. In iDEN, sending flow control to the remote DCE is handled automatically by the DCE's radio services. Thus, a value of '3' is functionally equivalent to a value of '1'.

8.3.6   DTE-DCE local flow control

This parameter selects the type of flow control used between the DTE and DCE while in data transfer mode.

This command is supported for backwards compatibility purposes. This command sets the method of flow control for both directions of the DTE-DCE interface, while the DTE-DCE local flow control (Section 8.3.5) command allows for separate setting for each direction. The setting of this command may implicitly alter the settings of the DTE-DCE local flow control (Section 8.3.5) command.

Operator	Syntax
Execute	&K<Flow Control>

Defined Flow Control Values

0	No flow control. The DCE ignores RFR and holds CTS ON.
3	RFR/CTS (hardware) flow control. The DCE turns CTS OFF to stop the flow of transmit data. The DTE turns RFR OFF to stop the flow of receive data.
4	XON/XOFF (software) flow control. The DCE {DTE} sends an XOFF character towards the DTE {DCE} to stop the flow of transmit {receive} data. The DCE {DTE} sends an XON character towards the DTE {DCE} to start the flow of transmit {receive} data. In this mode the DCE ignores RFR and holds CTS ON.

Range Response	Value Response	Default values
		3

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.3.7   DTE-DCE data rate control

This parameter specifies the data rate between the DTE and the DCE. It may be used to select an auto-bauding rate or a fixed data rate. The parameter, if absent, will default to '0'.

The auto-bauding control setting of this command(+**IPR=0**) will implicitly force the DTE-DCE character framing (Section 8.3.4) command to enable the auto-detection for parity.

Operator	Syntax
Query	+IPR?
Set	+IPR=[<Data Rate>]
Range	+IPR=?

Defined Data Rate Values

0	Manufacturer-specific auto- detection on baud rate, data framing.
300	Supported DTE-DCE transmission speed in bits per second.
1200	Supported DTE-DCE transmission speed in bits per second.
2400	Supported DTE-DCE transmission speed in bits per second.
4800	Supported DTE-DCE transmission speed in bits per second.
9600	Supported DTE-DCE transmission speed in bits per second.
19200	Supported DTE-DCE transmission speed in bits per second.
38400	Supported DTE-DCE transmission speed in bits per second.
57600	Supported DTE-DCE transmission speed in bits per second.
115200	Supported DTE-DCE transmission speed in bits per second.

Range Response	Value Response	Default values
+IPR: (0,300,1200,2400,4800,9600,19200, 38400, 57600, 115200)	+IPR: <Data Rate>	Varies by model

Possible Responses

Message Name	Execute	Query	Set	Range
OK			X	
ERROR	X		X	
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		

8.4   Service Selection Commands

8.4.1   Service class

This command is used to set the service class for any future connections.

The +FCLASS and #CLS command values are shared (setting either parameter affects the setting of the other).

Operator	Syntax
Query	+FCLASS?
Range	+FCLASS=?
Set	+FCLASS=<Service Class>
Query	#CLS?
Range	#CLS=?
Set	#CLS=<Service Class>

Note that the Range Response lacks the parenthesis common to other commands. Since the +FCLASS was defined prior to TIA-615, the parenthesis are left out to insure backwards compatibility.

Defined Service Class Values

0	Activate Class 0 services (Circuit Data)
2	Activate Class 2 services (Facsimile)
8	Activate Voice Services[1]

Range Response	Value Response	Default values
0, 2,8	<Service Class>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

1. See Section 3.3, "Voice Services," on page 6

8.4.2   Select DTE-side stack

This command's parameter allows the DTE to negotiate the DTE-side stack to be used by the DCE in on-line data state.

Operator	Syntax
Query	+WS45?
Range	+WS45=?
Set	+WS45=<DTE Stack Selection>

Defined DTE Stack Selection Values

0	Transparent character stream
1	Reliable Transparent character stream (TMDL)
3	SLIP/CSLIP
4	PPP

Range Response	Value Response	Default values
(0, 1, 3, 4)	<DTE Stack Selection>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.4.3   Select WDS-side stack

This command's parameter allows the DTE to negotiate the WDS-side stack to be used by the DCE for network activities.

Operator	Syntax
Query	+WS46?
Range	+WS46=?
Set	+WS46=<WDS Stack Selection>

Defined WDS Stack Selection Values

23	iDEN Circuit-Switched data/Fax
24	iDEN Packet Data
252	Local Data Services

Range Response	Value Response	Default values
(23,24,252)	<WDS Stack Selection>	23

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.4.4   On-line Control Preference

This command's parameter allows the DTE to request that the DTE side stack be invoked before the FNE side stack, or the FNE side stack before the DTE side stack (See Section 8.4.2 and Section 8.4.3).

Operator	Syntax
Query	+WS179?
Range	+WS179=?
Set	+WS179=<Invocation Order>

Defined Invocation Order Values

0   Do not wait for registration of WDS stack before requesting DTE stack.
1   Wait for registration of WDS stack before requesting DTE stack.

An important note about option 0 is that, in this operation, the DCE will ignore a subsequent failure of WDS-stack registration.

Range Response	Value Response	Default values
(0, 1)	<Invocation Order>	1

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.4.5 Select Bearer Service Type

This command selects the bearer service, the data rate, and the connection element to be used for mobile-originated data calls.

Operator	Syntax
Query	+CBST?
Range	+CBST=?
Set	+CBST=<Speed>,<Name>,<Connection Element>

Defined Speed Values

0	Autobaud (automatic selection of speed)
1-16	Equivalent to Autobaud in iDEN
129	Bell 103 Protocol Support
130	Direct IP
131-133	Reserved
134	Autobaud (Same as 0 for compatibility purposes)
135	Bell 212A Protocol Support
136-159	Reserved

Defined Name Values

0	Asynchronous Modem
1	Synchronous Modem

Defined Connection Element (CE) Values

1	Non-transparent

Range Response	Value Response	Default values
+CBST: (0-16, 129-159), (0,1), (1)	+CBST: <Speed>, <Name>, <CE>	0, 0, 1

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.5 User Image Management Commands

8.5.1 Restore Factory-Default Configuration

This command causes the DCE to reset all parameters and S-registers to their factory-defined default values. The parameter value, if present, must be 0.

Operator	Syntax
Execute	&F[0]

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.5.2   Restore User Default Configuration

This command causes the DCE to reset all parameters and S-registers to their user-defined default values.

Operator	Syntax
Execute	Z[<User Default Image>]

Defined Default Image Values

0   Image0 (Suggested use: Circuit Data)
1   Image1 (Suggested use: User Defined Settings)
2   Image2 (Suggested use: Packet Data)

Note: Image2 has been reserved by the service provider for the Unwired Planet internet browser. If the SU is capable of Unwired Planet, then your service-provider provided configuration information should be saved into this profile.

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.5.3   Save User Default Configuration

This command causes the DCE to save all parameters and S-registers to the codeplug in the image specified by the parameter value.

Some parameter values are actually stored in a "global" image, so that saving these values in one user-image implicitly applies these changes to _all_ user images. These specific parameters can be determined by referencing the command table in the beginning of Section 8 "Supported AT Commands" and looking for values that are "Global" in scope.

Operator	Syntax
Execute	&W[<User Default Image>]

Defined Default Image Values

0	Image0 (Suggested use: Circuit Data)
1	Image1 (Suggested use: User Defined Settings)
2	Image2 (Suggested use: Packet Data)

Note: Image2 has been reserved by the service provider for the Unwired Planet internet browser. If the SU is capable of Unwired Planet, then your service-provider provided configuration information should be saved into this profile.

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.5.4   View Stored Parameters

This command allows the DTE to view the parameter and S-register settings for the active configuration profile and the respective values stored in the currently active user image. Many of the commonly used AT command settings will be presented in the output.

Operator	Syntax
Execute	&V

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>	X			
ERROR		X	X	X

8.5.5   Select Power-Up User Profile

Sets the user default image to be read upon power-up.

Operator	Syntax
Execute	&Y[<User Default Image>]

Defined Default Image Values

0	Image0 (Suggested use: Circuit Data)
1	Image1 (Suggested use: User Defined Settings)
2	Image2 (Suggested use: Packet Data)

Note: Image2 has been reserved by the service provider for the Unwired Planet internet browser. If the SU is capable of Unwired Planet, then your service-provider provided configuration information should be saved into this profile.

Range Response	Value Response	Default values
		0

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR		X	X	X

8.6   Product Information Commands

8.6.1   Return Product Information

Causes the DCE to output a string giving product information. The contents of the string are implementation-specific. The string is terminated with the characters specified in S-registers 3 and 4.   The exact content of the returned strings have not been finalized, and most likely will not be finalized until formal software release.

Operator	Syntax
Execute	I<Product Information>

Defined Product Information Values

0	OK response code
1	iDEN DTE/DCE Specification (this document) Version
2	Software Model
3	Product Model
4	Product Manufacturer[1]

Index	Sample Output
0	OK
1	Interface Spec: 68P81129E10-C
2	MS-PPSM
3	MS-PPSM
4	Motorola, iDEN

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>	X			
ERROR	X	X	X	X

---

1. This value may be used to identify the manufacturer and will be constant for all iDEN wireless modems that conform to this standard.

8.6.2   Request DCE revision

The DTE uses this command to request a string of one or more lines of text from the DCE. The DTE may use this information to identify the revision number, version number, or other pertinent information regarding the DCE.

Operator	Syntax
Query	+FREV?
Range	+FREV=?
Query	+GMR?
Range	+GMR=?
Query	+CGMR?
Range	+CGMR=?

Sample Output
D05.01.12s
R28.00.00
B16.00.01tty

Range Response	Value Response	Default values
("DCE Revision Information")	See sample output	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.6.3   Request DCE model

The DTE uses this function to request a string of one or more lines of text from the DCE. The DTE may use this information to identify the DCE.

Operator	Syntax
Query	+FMDL?
Range	+FMDL=?
Query	+CGMM?
Range	+CGMM=?
Query	+GMM?
Range	+GMM=?

Sample Output
TM-ADV_RAV
TM-GOLDEN_EAGLE

Range Response	Value Response	Default values
("DCE Model Identification")	See sample output	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.6.4   Request DCE manufacturer

The DTE uses this function to request a string of one or more lines of text from the DCE. The DTE may use this information to identify the manufacturer of the DCE.

Operator	Syntax
Query	+FMFR?
Range	+FMFR=?
Query	+GMI?
Range	+GMI=?
Query	+GCMI?
Range	+GCMI=?

Range Response	Value Response	Default values
("DCE Manufacturer Information")	Motorola, iDEN	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.6.5   Request DCE Serial Number

This command causes the DCE to return its serial number to the DTE.

Operator	Syntax
Query	+CGSN?
Range	+CGSN=?
Query	+GSN?
Range	+GSN=?

Sample Output
Specific to individual DCE (typically 10 alpha-numeric characters)

Range Response	Value Response	Default values
("DCE Serial Number")	See Sample Output	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.7 Connection/Communication Diagnostic Commands

8.7.1 Extended Result Codes

This command requests the DCE to return the most recent Extended Error Code. The information returned will be a single number. The interpretation of this number can be found in Section 10.

Operator	Syntax
Execute	+CEER
Range	+CEER=?

Defined Error Code Values
0-65535 See section 11.

Range Response	Value Response	Default values
(0-65535)	<error_code>	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>	X			
ERROR		X	X	

8.7.2   Unimodem Diagnostics

This command queries a series of diagnostic information regarding the previous circuit data call, as specified in reference 16 Unimodem Diagnostics Command/Draft Reference Specification Revision 0.86.

Unlike most other commands described in this specification, this command is very complex and is therefore not detailed in this document. An application developer wishing to make use of this command should reference the Unimodem specification.

Operator	Syntax
Execute	#UD

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				
<VALUE RESPONSE>	X			
ERROR		X	X	X

8.7.3   Battery Status

This command returns the battery connection status and battery charge level of the DCE's battery.

Operator	Syntax
Execute	+CBC
Range	+CBC=?

Valid Battery Status Values

0   DCE powered by a battery
1   Battery present but not providing power
2   Battery not connected to DCE
3   Power Fault -Calls Inhibited

Defined Battery Level Values

0-100   Normalized Values

Range Response	Value Response	Default values
+CBC: (0-3), (0-100)	+CBC: <Battery Status>, <Battery Level>	

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>	X			
<RANGE RESPONSE>				X
ERROR		X	X	

8.7.4   Signal quality

This parameter is provided so that the DTE can monitor the network carrier's signal quality. The signal quality is reported on a scale of 0-100 with 100 being the highest quality.

Operator	Syntax
Range	+WS53=?
Query	+WS53?

These values are reported on a scale of 0-100. Since many of these values are based upon non-decimal values that are not normalized on a 0-100 scale, the reported number will not be expressed in units that are recognized by the iDEN system.

Defined Normalized Scale Values
0-100   Normalized Values

Range Response	Value Response	Default values
(0-100)	<Normalized Scale>	

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
<RANGE RESPONSE>				X
ERROR	X		X	

8.7.5   Signal strength

This parameter is provided so that the DTE can monitor the network carrier's signal strength. The signal strength is reported on a scale of 0-100 with 100 being the strongest signal.

Operator	Syntax
Range	+WS50=?
Query	+WS50?

These values are reported on a scale of 0-100. Since many of these values are based upon non-decimal values that are not normalized on a 0-100 scale, the reported number will not be expressed in units that are recognized by the iDEN system.

Defined Normalized Scale Values
0-100   Normalized Values

Range Response	Value Response	Default values
(0-100)	<Normalized Scale>	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.7.6   Display PD Status Information

This command returns a multi-line list of CDPD information.

Operator	Syntax
Execute	+WPSTATE
Range	+WPSTATE=?

Sample State Information Values

PACKET	SERVICE TYPE
123.111.210.50	VALID NEI
REGISTERED	REGISTRATION STATUS
REGISTERED	MIP REGISTRATION STATUS

As iDEN only supports Packet-Switched Packet Data, the SERVICE TYPE field will always equal PACKET. The VALID NEI field reports the NEI (DTE IP Address) that packet data registration was attempted with. The REGISTRATION STATUS message reports the state of packet data registration; the valid settings are REGISTERED and NO. The MIP REGISTRATION STATUS reports the state of mobile IP registration; the valid settings are REGISTERED, REGISTERING, and NOT REGISTERED.

Range Response	Value Response	Default values
	See Description	

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR		X	X	
OK	X			X

8.7.7   Display Channel Information

This command displays the CDPD WDS Channel Information.

Operator	Syntax
Execute	+WPCHANINFO
Range	+WPCHANINFO=?

CDPD Channel Information contains a multi-line list of parameters that define the CDPD WDS channel.

Sample Channel Information Values

003	Area
-0086	RSSI
00517	Channel
ACQUIRED	State
003	Tx Level

Range Response	Value Response	Default values
	See Description	

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR		X	X	
OK				X
<VALUE RESPONSE>	X			

8.8   Standard Compatibly Commands

8.8.1   PCCA miscellaneous commands

When the DTE invokes +**WCXF** action, the DCE will output the names of implemented miscellaneous commands. A DCE which operates in verbose mode and supports only the +**WS50** and +**WS51** commands would respond to +**WCXF** with:

"+WS50","+WS51"<CR/LF>OK<CR/LF>

Operator	Syntax
Execute	+WCXF
Range	+WCXF=?

Range Response	Value Response	Default values
("PCCA Annex F Commands")	Varies by radio model	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>	X			
ERROR		X	X	

8.8.2   PCCA wireless/wireline extensions

The returned value is a listing of the implemented extensions to the PCCA standard. iDEN supports the "WCXF" and the "WCXS" extension classes to the PCCA-101 standard.

For compliance indication, the DCE returns an OK with the supported subset standards or an ERROR result code.

Operator	Syntax
Execute	+W
Range	+W=?

Range Response	Value Response	Default values
("PCCA Annex Support")	Varies by radio model	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>	X			
ERROR		X	X	

8.8.3   iDEN specific commands

When the DTE queries the supported iDEN special mobile commands, the DCE will respond with the required mobile IP specific implementations. A DCE supporting only the +**WV200** and +**WV300** parameters would respond to +**WCXS** with:

"+WV200","+WV300"<CR/LF>OK<CR/LF>

Operator	Syntax
Execute	+WCXS
Range	+WCXS=?

Range Response	Value Response	Default values
("iDEN Commands")	Varies by radio model	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>	X			
ERROR		X	X	

8.8.4   CDPD Commands

The PCCA CDPD specification is detailed in Annex L of the PCCA STD101 specification.

When the DTE invokes +**WCXL** action, the DCE will output the names of implemented Annex L Commands.

Operator	Syntax
Execute	+WCXL
Range	+WCXL=?

Range Response	Value Response	Default values
("PCCA Annex L Commands")	Varies by radio model	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>	X			
ERROR		X	X	

8.9   Packet Data Configuration Commands

8.9.1   DCE IP address

This command sets the DCE's IP Address. This address is used only between the DTE and the DCE. The DCE can not be addressed from the internet. The DCE has an IP address so that messages can be exchanged between the DTE and DCE for the purposes of controlling the DCE and receiving status information from the DCE.

The DCE's IP address is really a 'dummy' IP address that only exists between the DTE and the DCE. As a result, this address may be a non-NIC approved address.

Operator	Syntax
Query	+WV304?
Range	+WV304=?
Set	+WV304=<IP address>

IP Addresses are sent as ascii strings in the format of "xx.xx.xx.xx". The quotes are part of the parameter and are not optional.

Each IP address may be followed by the "s" or "S" characters, signifying a point-to-point connection[1]. This suffix is optional, and has no affect upon radio operation.

Range Response	Value Response	Default values
("ddd.ddd.ddd.ddd")	<IP Address>	"10.23.6.1"

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

---

1. As described in reference 9. This optional suffix provides compatibility with an application using CDPD NEIs of type "S".

8.9.2   Packet Data Session Timer

This timer is used to control how long the DCE will stay on a Packet Channel while there is no traffic actively being transferred.

Operator	Syntax
Query	+WS175?
Range	+WS175=?
Set	+WS175=<Session Timer>

Defined Session Timer Values

0	Disable Sleep Timer (Remain on PCH forever)
5-255	Seconds idle before sleeping

Range Response	Value Response	Default values
(0, 5-255)	<Session Timer>	10

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.3   SLIP MTU setting

This is used to specify the Maximum Transmitted Unit used by SLIP connections (PPP connections negotiate this value).

Operator	Syntax
Query	+WV312?
Range	+WV312=?
Set	+WV312=<SLIP MTU>

Defined SLIP MTU Values
68-1500 MTU in Bytes

Range Response	Value Response	Default values
(68-1500)	<SLIP MTU>	1006

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.4   DCE Mobile IP Control

This parameter activates/deactivates the Mobile Node client in the DCE. The mobile host can operate in two modes to access iDEN packet data network.

For more information regarding Mobile IP, see Section 3.4.1.

At the time of this writing, there are no DTE-based stacks that are compatible with the iDEN Packet Data Network. This command is provided in order to support future stack implementations.

Operator	Syntax
Query	+WV300?
Range	+WV300=?
Set	+WV300=<DCE Mobile IP Control>

Defined DCE Mobile IP Control Values
0   Deactivate mobile node in the DCE.
1   Activate mobile node in the DCE.

Range Response	Value Response	Default values
(0, 1)	<DCE Mobile IP Control>	1

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.5 MIP Authentication Key

The MIP Authentication Key is used by the iDEN network to verify the authenticity of the DCE with the Home Agent. The DCE and the Home Agent must have identical values for this "shared secret key" in order for the DCE to satisfy the authentication process.

NOTE: This parameter is only applicable when the Mobile Node Client in the DCE is Activated.

Operator	Syntax
Range	+WV301=?
Set	+WV301=<MIP Authentication Key>

The Authentication Key parameter is a text string of up to 32 characters. Unlike most text-string parameters, the Authentication Key is a text-representation of a hexadecimal number. Therefore, only the characters 0-9, and A-F are acceptable parameter characters (the lower-case a-f characters are also accepted).

Note that although this parameter represents a numeric value, the parameter is actually a text string, so the parameter must be encapsulated within quotation marks.

Range Response	Value Response	Default values
("16 Byte Hexidecimal String")	<MIP Authentication Key>	Null String

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
ERROR	X	X	X	
OK			X	

8.9.6   MIP Registration Lifetime

This command determines the maximum amount of time that a remote node can be registered with its Home Agent before having to renew its registration. This parameter sets a user-preference for a value which is negotiated with the network. During the negotiation process, the user preference may be overruled by the network without notification.

NOTE: This parameter is only applicable when the Mobile Node Client in the DCE is Activated.

Operator	Syntax
Query	+WV302?
Range	+WV302=?
Set	+WV302=<Mobile IP Expiration Timer>

Defined Mobile IP Expiration Timer Values
1800-65534   Seconds before expiration.
65535   Timer never expires.

Range Response	Value Response	Default values
(1800-65535)	<Mobile IP Expiration Timer>	7200

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.7   DTE IP Address

This command sets the mobile node's permanent IP Address (also known as the Network Entity Identifier, or NEI).

Operator	Syntax
Query	+WPNEI?
Range	+WPNEI=?
Set	+WPNEI=<IP Specification>

Defined Address Type Values
S   Station (unicast) Address

Defined Internet Port Number Values
0   No Port Number Specified

Defined Address Family Values
0   No version specified
142   IP version 4

Defined Group Membership Identifier Values
0   Not supported.

Range Response	Value Response	Default values
"ddd.ddd.ddd.ddd, (S)",(0), (0,142),(0)	"<IP Address>, <Address Type>", <Internet Port Number>, <Address Family>,<GMID>	"0.0.0.0",0,0,0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.8   MIP Home Agent address

This command sets and queries the IP address of the Mobile Node's Home Agent. The Home Agent is a device on the home network that is forwarding datagrams to the DTE while the DTE is in the iDEN network.

NOTE: This parameter is only applicable when the Mobile Node Client in the DCE is Activated.

Operator	Syntax
Query	+WV305?
Range	+WV305=?
Set	+WV305=<IP Address>

Range Response	Value Response	Default values
("ddd.ddd.ddd.ddd")	<IP Address>	"0.0.0.0"

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.9 MIP Security Parameter Index

The value of the SPI parameter must match one of the value(s) which the Home Agent expects the mobile node to use. This value will be provided by the Home Agent administrator.

NOTE: This parameter is only applicable when the Mobile Node Client in the DCE is Activated.

Operator	Syntax
Query	+WV309?
Range	+WV309=?
Set	+WV309=<SPI>

The factory default value (0x00) may not be set by the DTE (This value will only be in the radio if it has either never been changed, or if the factory default parameter values are restored).

Defined SPI Values

0x00	SPI not configured
0x0100-0xFFFFFFFF	Valid Range

Range Response	Value Response	Default values
(0, 256 - 4294967295)	<SPI>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.10   Request Broadcast Datagrams

This command allows the DTE to request that the home agent tunnel any broadcast datagrams that it receives on the home network to the DTE.

Operator	Syntax
Query	+WV310?
Range	+WV310=?
Set	+WV310=<Broadcast Datagrams>

Defined Broadcast Datagrams Values
0   False
1   True

Range Response	Value Response	Default values
(0-1)	<Broadcast Datagrams>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.11 Mobile Node IP Prefix Length

The Prefix-Length is the number of contiguous bits in an IP address that make up the network-prefix (or network-number plus subnet-number) of that IP address.

This command sets the Prefix-Length of the Mobile Node's IP address, as specified by DTE IP Address on page 80.

Operator	Syntax
Query	+WV311?
Range	+WV311=?
Set	+WV311=<Prefix Length>

Defined Prefix Length Values

2-24   Supported Values

Range Response	Value Response	Default values
(2-24)	<Prefix Length>	24

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.9.12   TCP Header Compression

This command enables or disables TCP header compression options.

Operator	Syntax
Query	+WS182?
Range	+WS182=?
Set	+WS182=<Header Compression>

Defined IP Header Compression Values

0	Over-The-Air and Local Header Compression Enabled
1	Over-The-Air Header Compression Enabled
2	Local Header Compression Enabled
3	Header Compression Disabled

Range Response	Value Response	Default values
(0-3)	<OTA Compression>	2

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.9.13   OTA IP Data Compression

This command enables and disables over-the-air data compression for a packet data connection (+WS46=24).

Operator	Syntax
Query	+WS196?
Range	+WS196=?
Set	+WS196=<Compression>

The data Compression options are listed below.

Defined Compression Values

0   Compression Disabled
1   Compression Enabled

Range Response	Value Response	Default values
(0-1)	<Compression>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.9.14   Network Air-link Encryption

The DTE uses this command to select whether or not to encrypt the air-link interface and also how the air-link is encrypted. Encryption is negotiated during packet data registration.

Operator	Syntax
Query	+WV308?
Range	+WV308=?
Set	+WV308=<Encryption>,<Firm Offer >,< Key Size>

Defined Encryption Values
0   Disabled
1   Vancouver Encryption

Defined Firm Offer Values
0   Encryption Selection is a negotiable preference.
1   Encryption Selection is a not negotiable.

Defined Key Size Values
33-64   Encryption Key Size[1]

NOTE: If the DTE selects "Encryption Selection is a negotiable preference" and no forms of encryption are available, the data call will proceed without any encryption active and without notification. If the DTE selects "Encryption Selection is a not negotiable" and the network can not support the requested encryption algorithm, then the SLIP/PPP connection will be terminated.

Range Response	Value Response	Default values
(0,1),(0,1),(33-64)	<Encryption >,< Firm Offer >,< Key Size>	0,0,40

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

1. Some radio models may support maximum key sizes of 40.

8.9.15 DNS IP Address

The DTE uses this command to configure the DNS IP addresses used during a packet data connection. These addresses may be negotiated during PPP negotiation.

Operator	Syntax
Query	+WV324?
Range	+WV324=?
Set	+WV324=<Primary IP>,<Secondary IP>

IP Addresses are sent as ascii strings in the format of "xx.xx.xx.xx". The quotes are part of the parameter and are not optional.

Both parameters are optional. Any missing parameters will default to their current values.

Range Response	Value Response	Default values
"ddd.ddd.ddd.ddd", "ddd.ddd.ddd.ddd"	<Primary IP>,<Secondary IP>	"0.0.0.0", "0.0.0.0"

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.10 DTE/DCE Lock/Unlock Commands

8.10.1 Lock/unlock DCE

When the DCE is locked, most communication over the serial port to the radio is suspended until the DCE is unlocked. The only commands that a locked DCE will accept can be determined by referencing the command table in Section 8 "Supported AT Commands" and finding records with a "Y" in the LOCK column. These commands will function normally in a locked DCE. All other commands will return ERROR.

Entering PIN of "*" places the DCE into a validation mode for incoming PIN stream from the DTE. For more information concerning the PIN, see the Set PIN to lock/ unlock DCE (Section 8.10.2) command.

If the PIN has been removed (by setting its value to the empty string), the DTE must still specify the PIN, represented by the empty string ("").

A power cycle will not unlock the serial port.

Operator	Syntax
Range	+WCLK=?
Set	+WCLK=<Lock Status>,<PIN>

Defined Lock Status Values
0 - DCE Enable
1 - DCE Disabled

A PIN is stored as a series of ASCII bytes, terminated with a NULL (0x00) character, and with a maximum length of 8 characters (9 including NULL). If more than 8 characters are set as a PIN, only the first 8 are stored (No ERROR will be returned).

Range Response	Value Response	Default values
(0, 1), ("ASCII String")	<Lock Status>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		

Message Name	Execute	Query	Set	Range
ERROR	X		X	
OK			X	

8.10.2   Set PIN to lock/unlock DCE

Sets the PIN used to lock or unlock the DCE. Note that the desired PIN, as well as the current PIN, must be specified. Note that the factory-default PIN is the "empty string", or a value of "".

> An "Interactive" mode may be entered by specifying the asterisk as newPIN and not specifying a value for oldPIN, such in the following command line:
>
> at+wcpn="*"
>
> In this case, the DTE will respond with the +WNEWPIN: and +WPIN: response codes, prompting the values for newPIN and oldPIN (respectively).

The basic DCE operation parameters **E** and **V** are temporarily overridden to **E0V1** for no echo, verbose results. The original values for these parameters are restored upon the command's resolution.

Operator	Syntax
Range	+WCPN=?
Set	+WCPN=<newPIN>,<oldPIN>

> A PIN is stored as a series of ASCII bytes, terminated with a NULL (0x00) character, and with a maximum length of **8** characters (9 including NULL). If more than **8** characters are set as a PIN, only the first **8** are stored (no ERROR will be returned).
>
> The DCE's PIN is not case sensitive, and can only contain alphanumeric characters.

Range Response	Value Response	Default values
("8 Character ASCII String"), ("8 Character ASCII String)		PIN default is a NULL string

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
ERROR	X	X	X	
OK			X	

8.11   Class 2 Fax Commands

8.11.1   Adaptive Answer

This parameter indicated if the DCE will adoptively answer incoming circuit data class as class 2 or class 0. If adaptive answer is disabled, then the DCE will reject calls that are not of the same service class as the current +FCLASS setting.

Operator	Syntax
Query	+FAA?
Range	+FAA=?
Set	+FAA=<Adaptive Answer>

Defined Adaptive Answer Values

0   Constrains the DCE to answer as set by the Service class command.

1   The DCE answers automatically and determines whether to answer as a facsimile DCE or as a data modem. The Service class command is implicitly called if needed.

Range Response	Value Response	Default values
(0, 1)	<Adaptive Answer>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.2   Fax error code

The value of this parameter will be set to the most appropriate hang-up code as defined in reference 4.

Operator	Syntax
Query	+FAXERR?
Range	+FAXERR=?

Defined Fax Hang-up Code Values

0-255   As defined in reference 5.

Range Response	Value Response	Default values
(0-65535)	+FAXERR:<Fax Hangup Code>	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.11.3   Buffer size

The DTE may use this parameter to determine the characteristics of the DCE's data buffer. The reported values may be used by the DTE to transfer data without provoking XOFF.

Operator	Syntax
Query	+FBUF?
Range	+FBUF=?

This message contains the characteristics of the DCE's data buffer.

Valid ranges are not given, as the values are entirely DCE-dependent.

Range Response	Value Response	Default values
("Total, XOFF, XON, Current")	<Total>,<XOFF>, <XON>, <Current>	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.11.4 Capability To Receive

Indicates whether or not the DCE will receive message data. It also indicates whether or not the DCE will poll a remote device.

The value of this parameter is sampled in CCITT T.30 Phase A and Phase D.

Operator	Syntax
Query	+FCR?
Range	+FCR=?
Set	+FCR=<Capability to Recieve>

Defined Capability to Receive Values

0   The DCE will not receive message data nor will it poll a remote device.

1   The DCE will receive message data and it may poll a remote device.

Range Response	Value Response	Default values
(0, 1)	<Capability To Receive>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.5 DCE capabilities

This parameter allows the DTE to sense and constrain the capabilities of the facsimile DCE, from the choices defined in CCITT T.30.

Operator	Syntax
Query	+FDCC?
Range	+FDCC=?
Set	+FDCC=<VR>, ,<WD>,<LN>,<DF>,<EC>, <BF>,<ST>,

Defined VR (Vertical Resolution) Values
0   Normal, 98 lines/inch
1   Fine, 196 lines/inch
Defined BR (Bit Rate) Values
1   4800 bps (V.27ter)
3   9600 bps (V.29 or V.17)
Defined WD (Page Width) Values
0   1728 pixels in 215 mm
1   2048 pixels in 255 mm
2   2432 pixels in 303 mm
Defined LN (Page Length) Values
0   A4, 297 mm
1   B4, 364 mm
2   Unlimited Length
Defined DF (Data Compression Format) Values
0   Modified Huffman
1   Modified Read
Defined EC (Error Correction) values
0   Disable ECM
Defined BF (Binary File Transfer) Values
0   Disable BFT
Defined ST (Scan Time/Line) Values
0   0ms (VR=Normal), 0ms (VR=Fine)
1   5ms (VR=Normal),   5ms (VR=Fine)
2   10ms (VR=Normal),   5ms (VR=Fine)
3   10ms (VR=Normal),   10ms (VR=Fine)
4   20ms (VR=Normal),   10ms (VR=Fine)
5   20ms (VR=Normal),   20ms (VR=Fine)
6   40ms (VR=Normal),   20ms (VR=Fine)
7   40ms (VR=Normal),   40ms (VR=Fine)

Range Response	Value Response	Default values
(0,1), (1,3), (0-2), (0-2), (0,1), (0), (0), (0-7)	<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	0, 3, 0, 2, 0, 0, 0, 0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.6   Receive Phase C data

The Receive Phase C data command may be issued in Phase B after an answer command, or in Phase B after a previous document.

Notes:

• Polled reception is not supported.

The +FSPL parameter cannot be set to 1.

The DCE will never send the +FPOLL response to the DTE.

• Block mode is not supported.

The +FRBC parameter cannot be set non-zero.

• ECM operation is not supported.

The +FECM parameter cannot be set non-zero.

• Procedure interrupts are not supported.

The DTE is not allowed to set the +FPTS parameter to 4 or 5.

The DCE will never send a +FET: response with a <ppm> code of 4 or 5.

The DCE will always send the +FPTS: response with <ppr> code 1 (page good).

Operator	Syntax
Execute	+FDR

Possible Responses

Message Name	Execute	Query	Set	Range
FAX_NEGOTIATION	X			
OK				X
ERROR		X	X	

8.11.7 Transmit Phase C data

The +FDT command prefixes the Phase C data transmission. When the DCE is ready to accept Phase C data, it will report the negotiation responses and the CONNECT result code to the DTE.

In Phase B, the +FDT command releases the DCE to proceed with negotiation, and releases the DCS message to the remote station.

In Phase C, the +FDT command resumes transmission after the end of a prior transmit data stream or block.

The Phase C data must be of the format specified by the negotiated T.30 DCS frame (reported by the +FDCS: response).

NOTE: The subparameters [DF, VR, WD, LN] are not supported or recognized.

NOTE: Polled transmission, Block Mode, and ECM Operation are not supported.

Operator	Syntax
Execute	+FDT

Possible Responses

Message Name	Execute	Query	Set	Range
FAX_NEGOTIATION	X			
OK				X
ERROR		X	X	

8.11.8 Current session parameters

This parameter allows the DTE to sense and constrain the capabilities used for the current session.

This parameter stores the negotiated session parameters, which are constructed from the information sent by the IWF in the Fax Parameters message and the contents of the +FDIS parameter.

Operator	Syntax
Query	+FDIS?
Range	+FDIS=?
Set	+FDIS=\<VR>,\ ,\<WD>,\<LN>,\<DF>,\<EC>, \<BF>,\<ST>,

Defined VR (Vertical Resolution) Values
0   Normal, 98 lines/inch
1   Fine, 196 lines/inch
Defined BR (Bit Rate) Values
1   4800 bps (V.27ter)
3   9600 bps (V.29 or V.17)
Defined WD (Page Width) Values
0   1728 pixels in 215 mm
1   2048 pixels in 255 mm
2   2432 pixels in 303 mm
Defined LN (Page Length) Values
0   A4, 297 mm
1   B4, 364 mm
2   Unlimited Length
Defined DF (Data Compression Format) Values
0   Modified Huffman
1   Modified Read
Defined EC (Error Correction) values
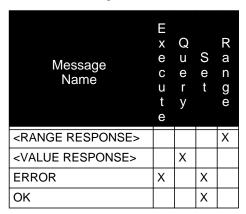0   Disable ECM
Defined BF (Binary File Transfer) Values
0   Disable BFT
Defined ST (Scan Time/Line) Values
0   0ms (VR=Normal), 0ms (VR=Fine)
1   5ms (VR=Normal),   5ms (VR=Fine)
2   10ms (VR=Normal),   5ms (VR=Fine)
3   10ms (VR=Normal),   10ms (VR=Fine)
4   20ms (VR=Normal),   10ms (VR=Fine)
5   20ms (VR=Normal),   20ms (VR=Fine)
6   40ms (VR=Normal),   20ms (VR=Fine)
7   40ms (VR=Normal),   40ms (VR=Fine)

Range Response	Value Response	Default values
(0,1), (1,3), (0-2), (0-2), (0,1), (0), (0), (0-7)	<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	0, 3, 0, 2, 0, 0, 0, 0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.9   Current session results

This command is used to query the current session settings, as requested by Current session parameters on page 100 after negotiation with the IWF.

Operator	Syntax
Query	+FDCS?
Range	+FDCS=?

Defined VR (Vertical Resolution) Values
0   Normal, 98 lines/inch
1   Fine, 196 lines/inch
Defined BR (Bit Rate) Values
1   4800 bps (V.27ter)
3   9600 bps (V.29 or V.17)
Defined WD (Page Width) Values
0   1728 pixels in 215 mm
1   2048 pixels in 255 mm
2   2432 pixels in 303 mm
Defined LN (Page Length) Values
0   A4, 297 mm
1   B4, 364 mm
2   Unlimited Length
Defined DF (Data Compression Format) Values
0   Modified Huffman
1   Modified Read
Defined EC (Error Correction) values
0   Disable ECM
Defined BF (Binary File Transfer) Values
0   Disable BFT
Defined ST (Scan Time/Line) Values
0   0ms (VR=Normal), 0ms (VR=Fine)
1   5ms (VR=Normal),   5ms (VR=Fine)
2   10ms (VR=Normal),   5ms (VR=Fine)
3   10ms (VR=Normal),   10ms (VR=Fine)
4   20ms (VR=Normal),   10ms (VR=Fine)
5   20ms (VR=Normal),   20ms (VR=Fine)
6   40ms (VR=Normal),   20ms (VR=Fine)
7   40ms (VR=Normal),   40ms (VR=Fine)

Range Response	Value Response	Default values
(0,1), (1,3), (0-2), (0-2), (0,1), (0), (0), (0-7)	<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	0, 3, 0, 2, 0, 0, 0, 0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.11.10 Transmit Page Punctuation

The +FET command indicates that the current page or partial page is complete; no more data will be appended to it. The value indicates if any additional pages are to be sent and, if so, whether there is a change in any of the documents parameters.

This command must be sent within the time out specified by +FPHCTO after sending Phase C data, else the DCE must end the page and document transmission. If the Phase C time-out is reached, the DCE shall send an EOP Post Page Message and terminate the session.

NOTE: Procedure interrupts and multi-document transmission are not supported

Operator	Syntax
Set	+FET=<Page Punctuation>
Range	+FET=?

Defined Page Punctuation Values
0   MPS - another page next, same document.
2   EOP - no more pages or documents.

Range Response	Value Response	Default values
(0, 2)	<Page Punctuation>	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
ERROR	X	X	X	
FAX_PP_RESPONSE			X	

8.11.11   Session termination

This command kills the session in an orderly manner. The DCE sends a DCN message at the next opportunity and then disconnects.

Operator	Syntax
Execute	+FK
Range	+FK=?

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
FAX_HANGUP	X			
OK				X
ERROR		X	X	

8.11.12 Page transfer status

Since the DCE does not perform copy quality checking, it always sets this parameter to 1 (page good). The DTE is permitted to set the parameter to other values, but since procedure interrupts are not supported, the DCE always behaves as if the value were 1.

Operator	Syntax
Query	+FPTS?
Range	+FPTS=?
Set	+FPTS=<Page Transfer Status>

Defined Page Transfer Status Values

1   Page Good

2-5   Interpreted by iDEN network as "Page Good".

Range Response	Value Response	Default values
(1-5)	<Page Transfer Status>	1

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.13   Local ID String, TSI/DSI

This command allows the DTE to query and set a Local ID String. The ID String may be up to 20 characters long.

If FLID is not a NULL string, the DCE will generate a TSI or CSI frame.

Operator	Syntax
Query	+FLID?
Range	+FLID=?
Set	+FLID=<Alpha-Numeric String>

Range Response	Value Response	Default values
("20 Character ASCII String")	<Alpha-Numeric String>	Null String

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.14 Bad Line Threshold

This command is used to select the maximum allowed number of consecutive lines with pixel count errors. The value of the parameter is the number of allowed lines.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FBADLIN?
Range	+FBADLIN=?
Set	+FBADLIN=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.15   Error Threshold Multiplier

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FBADMUL?
Range	+FBADMUL=?
Set	+FBADMUL=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.16 Data Bit Order

This parameter controls the mapping between PSTN facsimile data and the DTE-DCE link. In the iDEN network, the data bits may be "direct" or "reversed", specifying whether the first bit of each byte transferred over the DTE-DCE link should be the first (or last) bit transferred over the PSTN data carrier.

Operator	Syntax
Query	+FBOR?
Range	+FBOR=?
Set	+FBOR=<Bit Order>

Defined Bit Order Values

0   Direct bit order for Phase C data and for Phase B/D data.
1   Reversed bit order for phase C data and direct bit order for Phase B/D data.

Range Response	Value Response	Default values
(0-1)	<Bit Order>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.17   Session Message Reporting

Enables/Disables HDLC frame reporting. In iDEN, HDLC framing is not supported.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FBUG?
Range	+FBUG=?
Set	+FBUG=<Unsupported Value>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

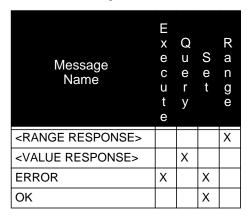| Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.18   Local Polling ID String

This command allows the DTE to query and set a Local Polling ID String. The ID String may be up to 20 characters long.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FCIG?
Range	+FCIG=?
Set	+FCIG=<Alpha-Numeric String>

Range Response	Value Response	Default values
("20 Character ASCII String")	<Alpha-Numeric String>	Null String

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.19   Copy Quality Checking

Enables/Disables copy quality checking by a receiving facsimile DCE. In iDEN, Copy Quality Checking is not supported.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FCQ?
Range	+FCQ=?
Set	+FCQ=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.20   ECM Retry Count

In Error Correcting Mode, this command configures the DCE to continue to transmit partial pages after the standard retry count of 4 attempts.

NOTE: The iDEN network does not support this feature. This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FCTCRTY?
Range	+FCTCRTY=?
Set	+FCTCRTY=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.21   Compression Format Conversion

This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FDFFC?
Range	+FDFFC=?
Set	+FDFFC=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.22   Error Correction Mode Control

This command controls support for T.30 Error Correcting Mode.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FECM?
Range	+FECM=?
Set	+FECM=<Unsupported Value>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.23   Page Length Format Conversion

This command disables/enables mismatch checking between the page length negotiated for the session and the Phase C data desired by the DTE. In iDEN, mismatch checking is not supported.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FLNFC?
Range	+FLNFC=?
Set	+FLNFC=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.24   Indicate Document to Poll

This command indicates if the DTE has a document to Poll.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FLPL?
Range	+FLPL=?
Set	+FLPL=<Unsupported Value>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.25   Minimum Phase C Speed

This parameter sets the lowest negotiable speed for the session.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FMINSP?
Range	+FMINSP=?
Set	+FMINSP=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.26   DTE Phase C Response Time-out

This command's parameter determines how long the DCE will wait for a command after reaching the end of data when transmitting in Phase C. After the time-out the DTE will send the T.30 EOP Response to the remote device.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FPHCTO?
Range	+FPHCTO=?
Set	+FPHCTO=<Timeout>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.27   Phase C Receive Data Block Size

This command selects between stream and block mode for Phase C data transfer from the DCE to the DTE.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FRBC?
Range	+FRBC=?
Set	+FRBC=<Unsupported Value>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.28   Phase C Received EOL Alignment

This command indicates whether or not EOL patterns are bit aligned as received.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FREL?
Range	+FREL=?
Set	+FREL=<Unsupported Value>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.29   Request to Poll

This command indicates whether or not a DTE wishes to Poll.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FSPL?
Range	+FSPL=?
Set	+FSPL=<Unsupported Value>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.30   Phase C Transmit Data Block Size

This command allows the DTE to select between stream mode and block mode for Phase C data transfer from the DTE to the DCE.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FTBC?
Range	+FTBC=?
Set	+FTBC=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.31   Vertical Resolution Conversion

This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FVRFC?
Range	+FVRFC=?
Set	+FVRFC=<Unsupported Value>

Defined unsupported Value Values

0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.11.32   Page Width Format Conversion

This command disables/enables mismatch checking between the page width negotiated for the session and the Phase C data desired by the DTE. In iDEN, mismatch checking is not supported.

NOTE: This command is supplied for compatibility purposes only.

Operator	Syntax
Query	+FWDFC?
Range	+FWDFC=?
Set	+FWDFC=<Unsupported Value>

Defined unsupported Value Values
0   Unsupported

Range Response	Value Response	Default values
(0)	<Unsupported Value>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.12 Compatibility Commands

8.12.1 Select Pulse Dialing

This command is supplied for compatibility. It has no processing effect.

Operator	Syntax
Execute	P

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR		X	X	X

8.12.2 Select Tone Dialing

This command is supplied for compatibility. It has no processing effect.

Operator	Syntax
Execute	T

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR		X	X	X

8.12.3   Monitor Speaker Volume

This command is supplied for compatibility. It has no processing effect.

Operator	Syntax
Execute	L<Speaker Volume>

Defined Speaker Volume Values
0-3   Valid Speaker Volume Settings

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.12.4   Monitor Speaker Mode

This command is supplied for compatibility. It has no processing effect.

Operator	Syntax
Execute	M<Speaker Mode>

Defined Speaker Values
0-3   Valid Speaker Mode Settings

Range Response	Value Response	Default values

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	X

8.12.5 Battery Charging Status

Note: This is command may return incorrect information if the DCE model does not possess the hardware support needed to accurately determine the information, or if the battery charger is not "smart".

Operator	Syntax
Execute	+WCHG
Range	+WCHG=?

The DCE responds with "Battery charging" whenever the battery is being charged, Otherwise, "Battery Not charging" will be returned.

Valid Battery Charge Status Values
0 - Battery not charging
1 - Battery charging

Range Response	Value Response	Default values
(0, 1)	<Battery Charge Status>	

Possible Responses

Message Name	Execute	Query	Set	Range
OK	X			
ERROR	X	X	X	
<RANGE RESPONSE>				X

8.12.6 Battery level

This command queries the current battery level of the DCE. The report is given on a scale of 0-100.

Operator	Syntax
Query	+WS52?
Range	+WS52=?

These values are reported on a scale of 0-100. Since many of these values are based upon non-decimal values that are not normalized on a 0-100 scale, the reported number will not be expressed in units that are recognized by the iDEN system.

Defined Normalized Scale Values
0-100   Normalized Values

Range Response	Value Response	Default values
(0-100)	<Normalized Scale>	

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
<RANGE RESPONSE>				X
ERROR	X		X	

8.12.7   Signal Status

This command returns the Received Signal Strength Indication (RSSI) and the Channel Bit Error Rate (BER) of the DCE's over-the-air connection.

Operator	Syntax
Range	+CSQ=?
Execute	+CSQ

Defined RSSI Values

0	-113 dBm or less
1	-111 dBm
10	-109... -89 dBm
17	-87... -67 dBm
24	-65... -53 dBm
31	-51 dBm or greater
99	Not known or not detectable.

Defined BER Values

99	Not known or not detectable.

Range Response	Value Response	Default values
(0-31, 99), (99)	<RSSI>, <BER>	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>	X			
ERROR		X	X	

8.12.8   Registration status

This command returns the current registration status for the selected WDS Network.

The return values are valid for Packet Data WDS stacks, and will return UNKNOWN for other networks.

Operator	Syntax
Range	+WS56=?
Query	+WS56?

Query Response
<Registration Status>

Defined Registration Status Values

0	not registered
1	registered
255	unknown

Range Response	Value Response	Default values
(0,1, 255)	<Registration Status>	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.12.9   Low Power State

In iDEN, entering a Low Power State activates paging subchannel operation. Although less power is consumed by the radio, there may be short delays in operation.

The value of this parameter states a User Preference. The radio may not be able to enter the Low Power State (if Dispatch Services are enabled, for example).

Note: The implementation of this command differs from the standard. Unlike the standard, there is no time-out timer which controls the low power state.

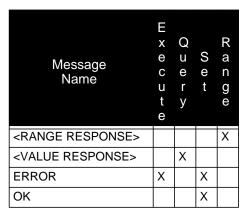| Operator	Syntax
Set	+WS58=<Low Power State>
Range	+WS58=?
Query	+WS58?

A radio in the "Low Power State" will have a short latency when receiving data packets. This Low Power State is the default mode of operation for radios without Dispatch capability. "Full Power State" is required for radios with Dispatch services, regardless of the user's preference.

Defined Low Power State Values
0   Enter Low Power State
1-255   Enter Full Power State

Range Response	Value Response	Default values
(0-255)	<Low Power State>	0 (See Text)

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	
OK			X	

8.12.10 Escape Code Character

The value in S2 specifies the ASCII character which is used to escape from data mode to command mode.

Operator	Syntax
Set	S2=<ASCII Byte>
Query	S2?

Defined Escape Code Values
0-127   Valid ASCII Range

Range Response	Value Response	Default values
(0-127)	<escape code>	43

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.11   Command Line Terminator

This command sets the character which will be recognized by the DCE to indicate the termination of an AT-command line. This character will also be used to terminate result code strings sent from the DCE to the DTE.

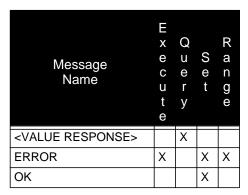| Operator	Syntax
Set	S3=<ASCII Byte>
Query	S3?

Defined Line Terminator Values
0-127   Valid ASCII Range

Range Response	Value Response	Default values
(0-127)	<Line Terminator>	13

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.12   Response Format

This command sets the character which will be sent by the DTE after the **Command Line Terminator** character in a response string.
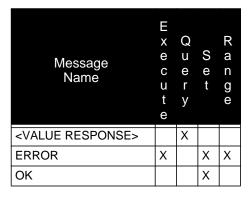
Operator	Syntax
Set	S4=<ASCII Byte>
Query	S4?

Defined Reponse Format Values
0-127   Valid ASCII Range

Range Response	Value Response	Default values
(0-127)	<Reponse Format>	10

Possible Responses

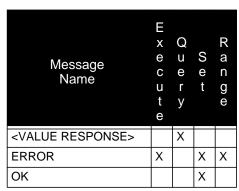| Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.13   Command Line Edit

This command defines a character which the DCE will interpret as a "backspace" key if found within an AT-command line.

Operator	Syntax
Set	S5=<ASCII Byte>
Query	S5?

Defined Edit Values
0-127   Valid ASCII Range

Range Response	Value Response	Default values
(0-127)	<Edit>	8

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.14   Pause Before Blind Dial

This command is supplied for compatibility. It has no processing effect.

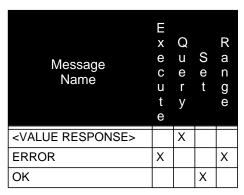| Operator	Syntax
Set	S6=<Blind Dial Timer>
Query	S6?

Defined Blind Daily Timer Values

2-10   Seconds to pause before blind Dialing

Range Response	Value Response	Default values
(2-10)	<Blind Dial Timer>	10

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X			X
OK			X	

8.12.15   Comma Dial Modifier Time

This command is supplied for compatibility. It has no processing effect.

Operator	Syntax
Set	S8=<Comma Dial Timer>
Query	S8?

Defined Comma Dial Timer Values
0-255   Comma dial modifier timer (Seconds)

Range Response	Value Response	Default values
(0-255)	<Comma Dial Timer>	2

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.16   Carrier Detect Response Time

The value of this timer used to determine how long a carrier must be present on the line before being recognized as a valid carrier.
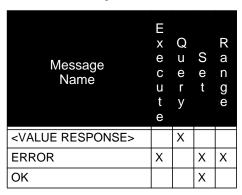
Operator	Syntax
Set	S9=<Carrier Detect Response Timer>
Query	S9?

Defined Carrier Detect Response Values
0-255   Carrier detect timer (1/10 Seconds)

Range Response	Value Response	Default values
(0-255)	<Carrier Detect Response Timer>	6

Possible Responses

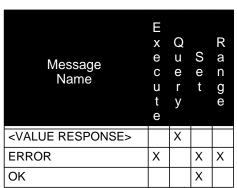| Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.17   Automatic Disconnect Delay

The value in S10 determines the time between the loss of carrier and the disconnection of the call.

Operator	Syntax
Set	S10=<Auto Disconnect Delay>
Query	S10?

Defined Auto Disconnect Delay Values

1-254   Disconnect Delay (1/10th Seconds)

Range Response	Value Response	Default values
(1-254)	<Auto Disconnect Delay>	14

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.18   Escape Code Timer

This timer sets an interval which must separate a valid escape sequence from transferred data. Additionally, the entire escape sequence must be entered within this time interval.

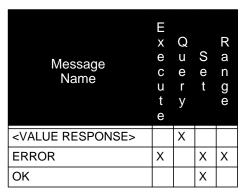The timer is equal to the value of the register times 1/50 seconds.

Operator	Syntax
Set	S12=<Escape Timer>
Query	S12?

Defined Escape Timer Values
20-255 Escape Timer   (1/50th Seconds)

Range Response	Value Response	Default values
(20-255)	<Escape Timer>	50

Possible Responses

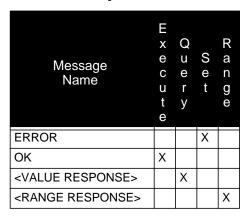| Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.19   Display Service

This command displays the current CDPD service mode of the DCE.

Note: In CDPD, two service modes are supported, Circuit Switched and Packet Switched Packet Data. iDEN only supports Packet Switched Packat Data.

Operator	Syntax
Execute	+WPSERVICE
Query	+WPSERVICE?
Range	+WPSERVICE=?

Range Response	Value Response	Default values
("PACKET")	"PACKET"	

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR			X	
OK	X			
<VALUE RESPONSE>		X		
<RANGE RESPONSE>				X

8.12.20   List all Network Entity Identifiers

This command displays a list of all IP addresses and their indexes in the DCE.

Since only a single Mobile Node IP Address is supported, the list will always consist of a single entry. This command is meant to give a complete list of the multiple IP address programed into the DCE and their registration status. Since iDEN only allows a single IP address to be registered at any moment, this command is supported mainly for compatibility purposes. As an alternative, see Section 8.7.6 "Display PD Status Information".

Operator	Syntax
Execute	+WPNEILIST
Range	+WPNEILIST=?

Range Response	Value Response	Default values
	see description	

Sample NEILIST Values

<dte_ip_address>,S <Reg_Status> *

dte_ip_address is the DTE ip address and <Reg_Status> is either NO or REG.

Possible Responses

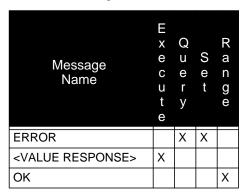| Message Name	Execute	Query	Set	Range
ERROR		X	X	
OK	X			X

8.12.21   Display Electronic Identification

This command displays the CDPD electronic ID of the DCE presented as six decimal numbers separated by periods.

In iDEN, this electronic ID has no significant translation, so an arbitrary value will be returned (0.0.0.0.0.0).

Operator	Syntax
Execute	+WPEID
Range	+WPEID=?

Range Response	Value Response	Default values
	0.0.0.0.0.0	

Possible Responses

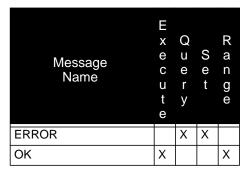| Message Name	Execute	Query	Set	Range
ERROR		X	X	
<VALUE RESPONSE>	X			
OK				X

8.12.22   Display RSSI/Channel State

This command queries the DCE for current RSSI, Channel State, Channel, and registration status.

Operator	Syntax
Execute	+WPRSSI
Range	+WPRSSI=?

Range Response	Value Response	Default values
	\<RSSI \>,\< State\>, \<Channel \>,\< Status\>	

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR		X	X	
OK	X			X

8.12.23   Display Registration State

This command displays the current registration status for the Mobile Node's IP address.

Operator	Syntax
Execute	+WPREGSTATE
Range	+WPREGSTATE=?

Range Response	Value Response	Default values
	<Registration_status>	

Defined Registration Status Values

REGISTERED   DCE is Packet Data Registered.

NO   DCE is not Packet Data Registered.

Possible Responses

Message Name	Execute	Query	Set	Range
ERROR	X	X	X	
OK	X			X

8.12.24   Registration Control

This command controls the DCE's registrations with the iDEN network. It is used for debugging purposes only. It allows the DTE to configure the DCE to hold off all over-the-air communication with the iDEN network until after the establishment of a DTE-side stack such as TMDL, SLIP, or PPP.

In order to effectively use this command, the WDS stack must be set to "Local Data Services", or "Packet Data". If the WDS stack is set to Packet Data, then +WS179 should be set to allow the invocation of SLIP∕PPP prior to the completion of Packet Data registration.

Operator	Syntax
Query	+WS173?
Range	+WS173=?
Set	+WS173=<Auto Register>

Defined Auto Register Values

0	Normal radio operation.
255	Wait until the ATD command is issued before initiating any over-the-air traffic.

Range Response	Value Response	Default values
(0,255)	<Auto Register>	0

Possible Responses

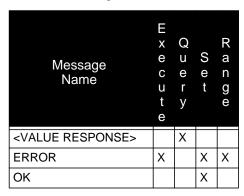| Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.25 Service Preference

This command defines the service preference for the DCE in respect to Circuit-Switched vs. Packet Switched Packet Data. The command is supplied for compatibility purposes.

Operator	Syntax
Query	+WS181?
Range	+WS181=?
Set	+WS181=<Service Preference>

Defined Service Preference Values

0   Always use packet switched CDPD.

Range Response	Value Response	Default values
(0)	<Service Preference>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.26 NEI Index

This command selects the NEI (IP Address) acted on by the +WPNEI, +WPREG, and +WPDEREG commands. Note that iDEN subscriber units are currently only allowed a single IP address, and therefore this command allows the management of a list consisting of a single entry.
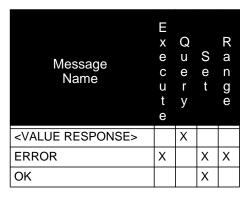
Operator	Syntax
Query	+WS197?
Range	+WS197=?
Set	+WS197=<NEI Index>

Defined NEI Index Values

1   NEI Index = 1 (only supported index)

Range Response	Value Response	Default values
(1)	<NEI Index>	1

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X
OK			X	

8.12.27   Report Equipment Error

This Command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the DCE. Although functional, this command is provided for compatibility purposes only.
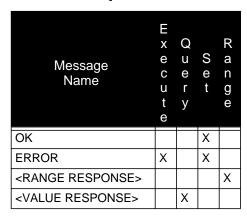
Review Section 9.1.1.1.1 for a description of the effects of enabling this parameter.

Operator	Syntax
Query	+CMEE?
Set	+CMEE=<Mobile Equipment Error>
Range	+CMEE=?

Defined Mobile Equipment Error Values
0   Use the standard syntax of the ERROR result code in all cases.
1   Enable +CMEE ERROR: <err> when appropriate.
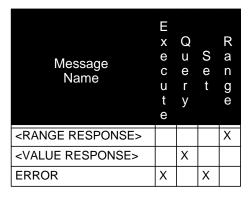
Range Response	Value Response
(0,1)	<Mobile Equipment Error>

Possible Responses

Message Name	Execute	Query	Set	Range
OK			X	
ERROR	X		X	
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		

8.12.28   Request DCE Capabilities

This command requests the overall capabilities of the DCE.

Operator	Syntax
Query	+GCAP?
Range	+GCAP=?

Range Response	Value Response	Default values
("Overall DTE Capabilities")	"+CGSM"	

Possible Responses

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
<VALUE RESPONSE>		X		
ERROR	X		X	

8.13   DCE Capability Commands

8.13.1   TPD/UPD Blocking

This command allows the DTE to query whether or not the SU is capable of simultaneous tethered and untethered packet data connections. If the SU is not capable of simultaneous connections, than any ongoing untethered PD service will be terminated and completely disabled before any thethered service is begun. The untethered service may then be re-initiated after the tethered service is terminated.

If the SU is capable of simultaneous connections, the DCE will verify that all critical packet data parameter settings are identical to those used by the ongoing untethered connection before it will allow simultaneous connections. If any of the critical parameters do not match, then the ongoing untethered connection will be terminated in the same fashion as if the SU were not capable of simultaneous connections.

The list of critical packet data parameters is:

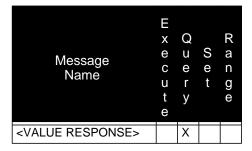"+WPNEI",”+WV319",”+WV300",”+WV301"+WPNEI",”+WV319",”+WV300",”+WV301""+WV302",”+WV304",
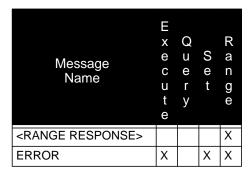
"+WV305", "+WV308", "+WV309", "+WV310", "+WV311",

Operator	Syntax
Query	+WV320?
Range	+WV320=?

Defined Blocking Values

0   SU is capable of simultaneous Tethered/Untethered connections

1   SU is not capable of simultaneous Tethered/Untethered connections

Range Response	Value Response	Default values
(0,1)	<Blocking>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		

Message Name	Execute	Query	Set	Range
<RANGE RESPONSE>				X
ERROR	X		X	X

8.13.2 Bootstrap Data Lock

This command allows the DTE to query whether or not the bootstrappable AT command parameters will be locked in the UNWIRED PLANET user profile (user image 2).

If the DTE tries to "SET" bootstrappable data when this data is locked, ERROR will be returned to the DTE. Additionally, in order to protect overall integrity, the user image that contains the bootstrapped data (usually Image2) can only be written to when the same user image is the active profile (in other words, you can not copy Image1 into Image2).

The list of Bootstrappable data is:

"+WPNEI","+WV319","+WV300","+WV301"+WPNEI","+WV319","+WV300","+WV301""+WV302","+WV304",

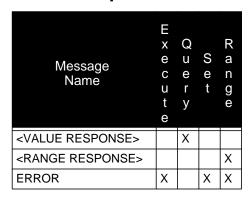"+WV305", "+WV309", "+WV310", "+WV311",

Operator	Syntax
Query	+WV322?
Range	+WV322=?

Defined Blocking Values

0   Bootstrap data (in user image 2) has not been locked.
1   Bootstrap data (in user image 2) has been locked

Range Response	Value Response	Default values
(0,1)	<Lock>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
<RANGE RESPONSE>				X
ERROR	X		X	X

8.13.3   UPD Auto-Start

This command allows the DTE to query whether or not the radio will attempt to Untethered Packet Data register (and Unwired Planet Register) upon power-up.
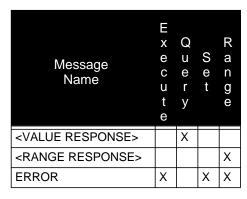
Operator	Syntax
Query	+WV323?
Range	+WV323=?

Defined Blocking Values

0   Unwired Planet will not be initiated at power up.

1   Unwired Planet will be initiated at power up.

Range Response	Value Response	Default values
(0,1)	<Blocking>	0

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
<RANGE RESPONSE>				X
ERROR	X		X	X

8.14   UP Link Configuration Commands

8.14.1   UPLink Net1 Configuration

This command allows the DTE to configure the Unwired Planet Microbrowser's "UPLink" addresses. The DCE supports 3 UPLinks, each with a primary and secondary IP address and port number. This command is specific to the first UPLink.
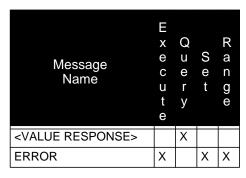
All of the parameters to this command are optional, which will allow the DTE to set a single parameter without affecting the other current settings (missing parameters will default to their current values).
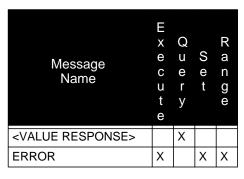
WARNING - Unlike most of the AT commands in this specification, the parameters for this command are not stored in a "user image". Therefore, when these parameters are changed, there are instantly stored into non-volatile memory and are independent of the ATZ, AT&F, and AT&W commands.

Operator	Syntax
Set	+WV313=[[<ip11>][,[<port1>][,[<ip2>],[<port2>]]]]
Query	+WV313?
Range	+WV313=?

IP Addresses are sent as ascii strings in the format of "xx.xx.xx.xx". The quotes are part of the parameter and are not optional.

Range Response	Value Response	Default values
("ddd.ddd.ddd.ddd",(0-65365), "ddd.ddd.ddd.ddd",(0-65365))	<ip1>,<port1>,<ip2>,<port2>	"0.0.0.0",1905, "0.0.0.0",1905

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X

8.14.2   UPLink Net2 Configuration

This command allows the DTE to configure the Unwired Planet Microbrowser's "UPLink" addresses. The DCE supports 3 UPLinks, each with a primary and secondary IP address and port number. This command is specific to the first UPLink.

All of the parameters to this command are optional, which will allow the DTE to set a single parameter without affecting the other current settings (missing parameters will default to their current values).
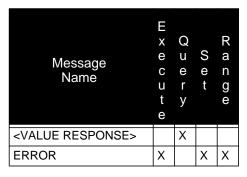
WARNING - Unlike most of the AT commands in this specification, the parameters for this command are not stored in a "user image". Therefore, when these parameters are changed, there are instantly stored into non-volatile memory and are independent of the ATZ, AT&F, and AT&W commands.

Operator	Syntax
Set	+WV314=[[<ip11>][,[<port1>][,[<ip2>],[<port2>]]]]
Query	+WV314?
Range	+WV314=?

IP Addresses are sent as ascii strings in the format of "xx.xx.xx.xx". The quotes are part of the parameter and are not optional.

Range Response	Value Response	Default values
("ddd.ddd.ddd.ddd",(0-65365), "ddd.ddd.ddd.ddd",(0-65365))	<ip1>,<port1>,<ip2>,<port2>	"0.0.0.0",1905, "0.0.0.0",1905

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X

8.14.3   UPLink Net3 Configuration

This command allows the DTE to configure the Unwired Planet Microbrowser's "UPLink" addresses. The DCE supports 3 UPLinks, each with a primary and secondary IP address and port number. This command is specific to the first UPLink.

All of the parameters to this command are optional, which will allow the DTE to set a single parameter without affecting the other current settings (missing parameters will default to their current values).

WARNING - Unlike most of the AT commands in this specification, the parameters for this command are not stored in a "user image". Therefore, when these parameters are changed, there are instantly stored into non-volatile memory and are independent of the ATZ, AT&F, and AT&W commands.

Operator	Syntax
Set	+WV315=[[<ip11>][,[<port1>][,[<ip2>],[<port2>]]]]
Query	+WV315?
Range	+WV315=?

IP Addresses are sent as ascii strings in the format of "xx.xx.xx.xx". The quotes are part of the parameter and are not optional.

Range Response	Value Response	Default values
("ddd.ddd.ddd.ddd",(0-65365), "ddd.ddd.ddd.ddd",(0-65365))	<ip1>,<port1>,<ip2>,<port2>	"0.0.0.0",1905, "0.0.0.0",1905

Possible Responses

Message Name	Execute	Query	Set	Range
<VALUE RESPONSE>		X		
ERROR	X		X	X

9 Command Responses

Table 17: Command Responses

Classification	Message Name	Numeric Message	Text Message	Message Description
Result Codes	OK	0	OK	Acknowledges execution of the command.
	CONNECT	1	CONNECT	A connection has been established.
	RING	2	RING	Incoming call signal from the network.
	NO CARRIER	3	NO CARRIER	The connection has been terminated, or the attempt to establish a connection has failed.
	ERROR	4	ERROR	DCE encountered a problem processing the command line.
	NO DIALTONE	6	NO DIALTONE	Service unavailable or not provisioned by network.
	BUSY	7	BUSY	DCE or Network resources not available for connection.
	NO ANSWER	8	NO ANSWER	Connection time-out during establishment.
Information Responses	<VALUE RESPONSE>	None	Section 9.1.2.1.1	Parameter Value Response.
	<RANGE RESPONSE>	None	Section 9.1.2.1.2	Range Request Response.
Call Control Responses	FAX_PP_RESPONSE	None	Section 9.1.3.1.1	Page Punctuation Response
	FAX_NEGOTIATION	None	Section 9.1.3.1.2	Begin Phase C Transmission
	FAX_HANGUP	None	Section 9.1.3.1.3	Termination of a FAX call
	FAX_END_RCV	None	Section 9.1.3.1.4	End of Incoming transmission.
	SERVICE_REPORT	None	Section 9.1.3.1.5	Service Report Code

9.1 Response Classifications

Two types of messages are sent from the DCE to the DTE in response to commands. These types are Result Codes and Information Responses.

9.1.1 Result Codes

One result code is sent to the DTE for each command line sent to the DCE. It is sent after all commands in the command line have been executed. The DTE may use the reception of a Result Code as an indicator that the DTE has finished the execution of the command line and use the contents of the Result Code to determine the current state of the DCE and of the data connection.

9.1.1.1 Result Code Syntax

Each result code has an associated Text Message and Numeric Message, which may be referenced in Table 17, "Command Responses," on page 163. These values are used to determine the response syntax, as described in Section 9.2.

9.1.1.1.1 ERROR

The ERROR result code is further effected by theReport Equipment Error (Section 8.12.27) command. If Mobile Equipment Error Reporting is enabled, then an alternate syntax for the ERROR result code is used in circumstances where the command failed due to the functionality of the DCE. In cases where the ERROR is due to syntax or invalid parameters, the ERROR result code is not affected.

If the ERROR result code is modified due to the +CMEE command, then the DCE returns the string "+CME ERROR: <err>" to the DTE instead of "ERROR" or "4".

Possible values of <err> are:

    100   Unknown

9.1.2 Information Responses

Information Responses are sent to the DTE whenever appropriate. Therefore, more than one Information Response may be sent to the DTE for each command line sent to the DCE.

9.1.2.1 Information Response Syntax

Unlike Result Codes, Information Responses do not have associated Numeric Messages. This is because the message body of an Information Response is not effected by the Result Code Format (Section 8.2.1) in the same fashion as Result Codes. Also unlike Result Codes, the contents of an Information Response is not constant (it varies by command and parameter value).

9.1.2.1.1 VALUE_RESPONSE

This message is the response to a request for the current parameter values. The message body consists of a string specifying the current value or values. Values that are strings of ASCII characters are encapsulated within double quotation marks (numeric values are not). Multiple parameter values are separated by a comma and a single ASCII <space> character.

9.1.2.1.2 RANGE_RESPONSE

This message is the response to a request for valid parameter ranges. The message body consists of a string explaining the legal parameter values, encapsulated with double quotation marks. The contents of this string are described in the description of the command parameters in Section 8. The particular subsection relevant to each command is specified in the descriptions of each command in Section 8.

9.1.3   Facsimile Call Control Responses

Facsimile call control responses are sent from the DTE to the DCE to report the status of parameters negotiated by the DCE with the network. Such responses are followed by a Result Code.

9.1.3.1   Facsimile Call Control Response Syntax

Unlike Result Codes, Information Responses do not have associated Numeric Messages. This is because the message body of an Information Response is not effected by the **Result Code Format** in the same fashion as Result Codes.

9.1.3.1.1   FAX_PP_RESPONSE

This message is the response to a request to transmit facsimile page punctuation. The syntax of the message is:

> +FPTS:<Page Punctuation>

For the definition of <Page Punctuation>, see Section 8.11.10.

This response is followed by a the OK result code.

9.1.3.1.2   FAX_NEGOTIATION

This message is the response to a request from the DTE to being Phase C data transmission.

The +FTSI and +FDCS lines will only be present if they contain newly determined information:

> +FCFR
>
> +FTSI<Remote ID>
>
> +FDCS: <Negotiated subparameters>

This response is followed by the CONNECT result code.

9.1.3.1.3   FAX_HANGUP

This result code is send at the end of the facsimile termination process. The message is formatted as follows:

> +FHNG: <Fax Hang-up Code>

For the definition of <Fax Hang-up Code>, see 8.11.11 - .

9.1.3.1.4   FAX_END_RCV

This "unsolicited" response code is generated by a receiving DCE after the end of Phase C reception, on receipt of the post-page message from the transmitting station. The syntax of the message is:

> +FET:<Page Punctuation>

For the definition of <Page Punctuation>, see Section 8.11.10.

SERVICE_REPORT

This result code is sent to the DTE preceding the CONNECT result code. It is Enabled and Disabled with the **Service Reporting Control** command (+CR). The message is formatted as follows:

+CR: REL ASYNC

9.2   Response Syntax

The exact syntax of command responses is determined by the interaction of several commands and parameters. In particular, these commands are **Result Code Format**, **Extended Result Codes**, and **Result Code Control** (described in Section 8.2.1, Section 8.2.2, and Section 8.2.3 respectively).

9.2.1   Verbose and Terse Format Settings

The **Result Code Format** command toggles response format between "Terse" and "Verbose" modes. The response string is formatted as detailed in the table below:

	Terse Mode (V0)	Verbose Mode (V1)
Information Responses	\<hdr>\<Text Message>\<cr>\<lf>	\<cr>\<lf>\<hdr>\<Text Message>\<cr>\<lf>
Result Codes	\<Numeric Message>\<cr>	\<cr>\<lf>\<Text Message>\<cr>\<lf>

Note the following definitions:

\<Text Message>	Found in the table in Section 9.
\<Numeric Message>	Found in the table in Section 9.
\<cr>	Specified by **Command Line Terminator** (Section 8.12.11)
\<lf>	Specified by **Response Format** (Section 8.12.12)
\<hdr>	Extra header info used for some commands (Section 9.3)

Regardless of the setting of the **Result Code Format** command, the response may still be suppressed by appropriate values of the **Result Code Control** command.

9.2.2   Extended Result Code Settings

The **Extended Result Codes** command may be used to toggle the use of the NO DIALTONE and BUSY result codes. One, both, or neither of the result codes may be active. If a result code is inactive when conditions deem it appropriate to send it to the DTE, a result code of NO CARRIER will be substituted.

9.2.3   Result Code Suppression

The **Result Code Control** command determines whether or not Result Codes are sent to the DTE. Note that information responses are sent regardless of the setting of this parameter. Also note that the setting of this parameter overrides any result code configuration via the **Result Code Format** and **Extended Result Codes** commands.

9.3   Information Header Strings

The iDEN subscriber unit was designed to adhere to multiple command standards. Some of these standards use a slightly different syntax for reporting Information

Responses. To account for these changes, the <hdr> field was added to the Response Syntax (see Section 9.2).

The table below contains the header strings used for each command response. If a command is not found on this table, then it can be assumed that the header is a Null String.

Command	<VALUE RESPONSE> Header	<RANGE RESPONSE> Header
+ICF	+ICF:	+ICF:
+IFC	+IFC:	+IFC:
+IPR	+IPR:	+IPR:
+CBC	+CBC:	+CBC:
+CR	+CR:	+CR:
+FAXERR	+FAXERR=	
+CEER	+CEER:	

10 Extended Error Result Codes

Each response message is accompanied by an Extended Error Result Code. This extra code often times contains extra helpful information regarding the conditions which resulted in a particular response message.

The extended result code may be requested from the DCE by use of the Extended Result Codes command (see Section 8.7.1).

An Extended Result Code is reported as a single number. This number really consists of two smaller numbers, which can be derived as follows:

EERC = <Extended Error Result Code>

Source = (EERC ⁄ 255) Truncated to an integer value

Cause = EERC - (Source x 256)

The following table conatins many of the extended error result codes which the DCE may return. The list is not complete, but will provide guidance for the resolution of many common problems.

Extended Error Result Code Definitions

Source	Cause	Description
0x01	0x01	No Further Information Available.
0x01	0x03	Command issued during improper state (Command/On-line).
0x01	0x04	Connection Aborted by DTE.
0x01	0x05	Command Operator not legal for this command (Syntax Error).
0x01	0x06	Connection Aborted due to connection timer timeout.
0x01	0x07	Parameters were of an invalid format or out of range.
0x01	0x0A	Service Class not valid for current WDS-side stack
0x01	0x0B	DTE-side stack not valid for current WDS-side stack
0x01	0x0C	Invalid DTE-IP address specified (+WPNEI)
0x01	0x0D	Invalid Home Agent Address specified(+WV305)
0x01	0x0E	Invalid MIP Security Parameter Index specified. (+WV309)
0x01	0X0F	DCE IP address matched HA IP Address(+WV304,+WV305)
0x01	0x10	The DTE tried to lock or unlock the DCE using an incorrect PIN
0x01	0x11	Power-Up Test Mobile Mode failed entry conditions
0x01	0x12	Power-Up Test Mobile Mode Entered
0x01	0x13	WDS stack not compatible with command
0x01	0x14	The DCE terminated a connection due to DTR status
0x01	0x15	Terminated a connection due to a conflict with a new session.
0x01	0x16	Problem writing to the codeplug
0x01	0x17	The PIN entered was of an invalid format
0x01	0x18	The DCE terminated a session at the DTE's request (ATH)
0x02	0x07	Requested level of encryption not allowed.
0x02	0x21	Service not provisioned.
0x02	0x64	Packet Data Registration Error. Contact your Service Provider.
0x04	0x01	SLIP/PPP Failed to respond
0x04	0x02	SLIP/PPP Failed to configure connection
0x04	0x03	SLIP/PPP Link Termination
0x05	0x00	No Information Available
0x05	0x0A	Unspecified Transmit Phase A Error
0x05	0x14	Unspecified Transmit Phase B Error
0x05	0x28	Unspecified Transmit Phase C Error
0x05	0x32	Unspecified Transmit Phase D Error
0x05	0x46	Unspecified Receive Phase B Error
0x05	0x50	Unspecified Receive Phase C Error
0x05	0x5A	Unspecified Receive Phase D Error

Source	Cause	Description
0x06	0x02	No Route to specified transit network
0x06	0x03	No Route to destination
0x06	0x11	Called Unit Busy
0x06	0x1B	Destination out of order
0x06	0x1C	Invalid Number Format-Incomplete
0x06	0x22	No Circuit/Channel Available
0x06	0x26	Network out of order
0x06	0x29	Temporary Failure
0x06	0x2A	Switching Equipment Congestion
0x06	0x2C	Requested Circuit/Channel not available
0x06	0x2F	Resource Unavailable
0x06	0x3A	Bearer Capability not presently available
0x06	0x39	Bearer Capibility not authorized
0x06	0x3F	Service or option not available
0x06	0x41	Bearer Service not Implemented
0x06	0x42	Channel Type not Implemented
0x06	0x4F	Service or option not implemented
0x06	0x58	Incompatible Destination
0x06	0x66	Network Timer Timeout