User Guide

CSI-380 Signaling Specification

DEES COMMUNICATIONS

Table of Contents

Notice

Some of the information contained in this document was acquired from widely available published information. Dees Communications Corporation makes no representation as to the accuracy or validity of the specification dealing with information that did not originate at Dees, nor does Dees guarantee that Northern Telecom will not change its signaling format or specification.

Overview

Meridian ™ Digital Centrex (MDC) provides advanced telecommunications features for sophisticated business users. MDC offers its customers advanced telecom services such as Multi-line Service, Call Hold, Call Forward, Speed Dial, and Call Transfer through software packages installed and maintained at the Central Office.

MDC services are implemented by way of a proprietary signaling method enabling M5000 Series telephone sets, the CSI-380 Centrex Serial Interface, and the DMS-100™ Central Office Switch to communicate detailed call signaling and display information. This information forms the basis of MDC feature implementation. The M5000 Series telephone set is also called a Meridian Business Set (MBS), or P-phone.

MDC features such as Hold, Release, Transfer, Speed Dial, and Conference are all activated at the Central Office as a result of a key pressed on the telephone. All M5000 Series telephone sets have a standard key arrangement that includes digits 0-9, *, #, Hold, Release, and a number of Feature Keys. The Feature Keys are used to activate MDC services and may differ from set to set. The Central Office keeps a profile of each set which includes Feature Key assignment, thus the signaling commands sent to the Central Office are always the same for each key but the feature that each key activates may be different.

The CSI-380 enables a computer application to send and receive MDC call signaling and display information on a Meridian Digital Centrex line, allowing the computer applications programmer full access to all MDC services and features that are available on M5000 Series telephone sets. The CSI-380 may only be used with an M5000 Series telephone set or on a line configured for use with an M5000 Series telephone set.

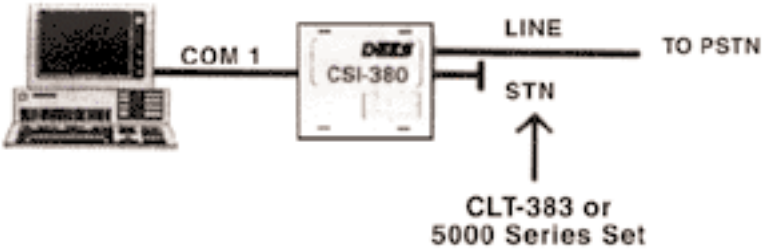
Installation

Connect the telephone line cord from the wall outlet to the LINE jack on the CSI380. If you have an MBS telephone set such as a 5209 or 5312, connect the telephone cord from the telephone to the STATION SET jack on the CSI-380. If you are using the CSI-380 without a telephone set attached, connect a Dees CLT-383 Centrex Line Termination to the STATION SET jack on the CSI-380. Connect a standard serial cable from the serial port of your computer to the RS232C port on the CSI-380. Connect the power supply to the POWER jack on the CSI-380 and plug in the power supply to the wall outlet.

Configure the serial port on your computer for 2400 bps, no parity, 8 data bits, 1 stop bit, half duplex transmission. If you want to test communications between the PC and the CSI-380, use a terminal emulation program such as Microsoft® Windows™ Terminal. Load the program and configure your serial port, then unplug and plug in the power supply for the CSI-380. On your screen you should see:

```
RESET
OK
```

This indicates that the PC and the CSI-380 are communicating with each other.



Command Echoing

The CSI-380 may be programmed to echo commands back to the PC (default) or to not echo commands back to the PC. To program the CSI-380 to not echo commands back to the PC, the following command must be sent. At the PC keyboard, type:

```
ATE0<cr>
```

where <cr> means the Enter key on your keyboard. The CSI-380 will respond with:

```
OK
```

To program the CSI-380 to echo commands back to the PC(the default setting), the following command must be sent. At the PC keyboard, type:

```
ATE1<cr>
```

The CSI-380 will respond with:

```
OK
```

CSI-380 Operation

Modes of Operation

The CSI-380 may be used in either one of two modes:
- Normal Operation (with an MBS telephone) or Standalone (without an MBS telephone). Normal Operation means that there is an MBS telephone attached to the CSI-380, and that the computer will be used to monitor and enhance the telephone.
- Standalone Operation means that there is no telephone attached to the CSI-380, and that the computer will be used to replace the telephone or to monitor Central Office commands.

Initialization for Normal Operation

The CSI-380 must be initialized in order to prepare it for use on the MDC telephone line. If you are using the CSI-380 with an MBS telephone (Normal Operation), then you must send it one initialization string. At the PC keyboard, type:

```
ATS93=2<cr>
```

where <cr> means the Enter key on your keyboard. The CSI-380 will respond with:

```
OK
```

If you want to verify that the CSI-380 has been initialized, then at the PC keyboard, type:

```
ATS93?<cr>
```

The CSI-380 should respond with:

```
002
OK
```

indicating that the CSI-380 has been initialized in Normal mode.

Initialization for Standalone Operation

If you are using the CSI-380 **without an MBS telephone** (Standalone Operation), then you must send it four initialization strings. At the PC keyboard, type:

```
ATS90=1<cr>
ATS91=1<cr>
ATS93=2<cr>
ATS94=1<cr>
```

where <cr> means the Enter key on your keyboard. If you want to verify that the CSI-380 has been initialized, then at the PC keyboard, type:

```
ATS90?<cr>
```

The CSI-380 should respond with:

```
001
OK
```

indicating that the CSI-380 has been initialized in Standalone mode.
This may be repeated for all initialization strings.
Table 1 is a summary of CSI-380 Initialization Commands.

Meridian Digital Centrex Commands

When the handset of an MBS telephone is lifted off-hook, the telephone transmits a special off-hook code to the central office indicating that the receiver is off-hook. In response to this, the Central Office sends a series of commands back to the telephone, such as *Indicator 1 On* and *Handset On*. The CSI-380 is used to monitor these commands as they are exchanged between the telephone and the Central Office, or it is used to send commands to the Central Office along with or instead of a telephone.

Every command sent to the Central Office by the telephone or by the computer will produce a particular response by the Central Office, depending on the command, and every command sent by the Central Office will produce a particular response in the telephone. These may be used by the computer to monitor and control the call, activate and respond to MDC features, and receive calling party information. The computer may be used to dial numbers, activate stored speed dial numbers, use MDC features such as Call Hold, Call Forward, and Transfer, and to display on the screen or pass to a software application information about calling parties, such as their name and telephone number. Commands are sent from the computer to the Central Office in the following format:

```
AT^XXX<cr>
```

where '^' is the circumflex character and 'XXX' is the three digit MDC command code. If the command has been sent by the CSI-380 and received by the Central Office correctly, the CSI-380 will reply with:

```
OK
```

Note that all strings sent from the CSI-380 to the computer are terminated by a carriage return

MDC commands are divided into three groups: Call Signaling commands, Display commands, and Display Character codes, used to put text information on the computer screen or the display of the telephone. All commands are described in the following sections.

Note that there may be additional codes appearing on the MDC line that are not listed in this specification. These codes are intended for devices other than an MBS telephone and should be ignored.

Call Signaling Commands

Telephone to Central Office Call Signaling Commands

The commands listed in Tables 2 and 3 describe all the signaling codes that will be sent by the telephone if the appropriate key is pressed or if the phone is taken off-hook.

Central Office to Telephone Call Signaling Commands

The commands listed in Tables 4 and 5 describe all the signaling codes that will be sent by the Central Office in response to incoming calls, to keys pressed on the telephone, or to codes sent by the computer. The purpose of each code describes

the action taken by the telephone, the meaning that an applications program may derive from the code, or the action that should be taken by an applications program in a Standalone configuration.

Through the use of the Indicator Signaling commands, the Central Office controls the indicators on the telephone, and communicates to the user the state of a particular line or feature. If a Feature Key is assigned a Directory Number, the associated indicator represents the state of the telephone line for that number. Off means the line is on-hook and idle, Wink means the line is on hold, Flash means the line is ringing, and On means the line is off-hook and active. If a Feature Key is assigned to a specific feature, such as Call Forward, then the indicator states describe functions about the feature.

The three reset commands are used by the Central Office to place the telephone (or applications program) into a known state. Soft Reset sets the telephone back to idle, Save Indicator Reset does the same thing but doesn't turn off the indicators, and Hard Reset is equivalent to unplugging and plugging in the telephone.

The **Alert On** and **Alert Off** commands are used to indicate that the line is ringing. Alert On means the line is ringing, and Alert Off means the line has stopped ringing because the call has been answered or because the caller hung up.

The **Buzzer On** and **Buzzer Off** commands are used to indicate a line is ringing when the phone is currently off-hook, or can be used in conjunction with some features. These commands cause the buzzer in the phone to turn on and off. The Voice On and Voice Off commands control the line monitor in the phone. They are used for on-hook dialing and other features.

The **Handset On** and **Handset Off** commands are used to enable the phone's handset electronics. These commands are typically part of the Central Office response to On-hook and Off-hook commands sent by the phone or computer.

The **Handsfree On** and **Handsfree Off** commands are used to control hands-free phones in conjunction with some MDC features. They will not be sent if the line is not configured for use with a hands-free telephone.

Echo Mode is used by the Central Office as part of automatic line diagnostic routines. While a device is in Echo Mode, any command received from the Central Office is not acted on but is sent back (echoed) to the Central Office. The exceptions to this are the receipt of a Reset command or the Close Echo Mode command, any of which will cause Echo Mode to be closed. If your installation is configured for Normal Operation (CSI-380 with a telephone) then any applications software must not respond to Open Echo Mode or Close Echo Mode commands. If your installation is configured for Standalone Operation (no attached telephone) then the CSI-380 may be set to respond automatically to Open Echo Mode and Close Echo Mode commands, or the applications software may be responsible for implementing the Echo Mode requirements. In most standalone situations, it is best that the CSI-380 be set to handle Echo Mode. This is accomplished by setting the contents of S-register 91 to a 1. In addition, the computer must not attempt communications with the CSI-380 while either it or the phone are in Echo Mode. To assist in this, the CTS line on the CSI-380 will go false during Echo Mode.

Display Commands and Characters

The display used on a M5000 Series telephone set consists of 2 lines with 24 characters each. There are a number of commands associated with the way character information is written to the display and to indicate how dialed digits are put on the display. The display buffer holds all character information to be put on the display. Enabling the display causes characters in the buffer to be shown on the display. If the display is enabled, any buffer commands will be immediately reflected in the display. If the MDC line is not configured for use with a display phone, display commands may not be sent.

Display Signaling Commands

Characters are written to the buffer in either Normal Display Mode or Digit Display Mode. In Normal Display Mode, the Central Office sends character information to the telephone or computer to be put on the display. Characters are displayed at the current cursor location, the cursor location is incremented after each character is entered, and the cursor wraps from Line 2 Column 24 to Line 1 Column 1. In Digit Display Mode all dial pad key presses cause the digit to appear in the display buffer at the current cursor location, the cursor location is incremented after each digit, and the display shifts left one position when a digit is entered at Line 2 Column 24.

Tables 6 and 7 describe all Display Signaling commands.

Transmit Display Status

The Transmit Display Status (TDS) command is used by the Central Office as part of automatic line diagnostic routines and to determine if a phone is capable of displaying character information.

- If you are configured for Normal Operation (CSI-380 with a telephone) and the telephone has a working display, any applications software must not respond to the TDS command.
- If you are configured for Standalone Operation (no attached telephone), the applications software must respond to the TDS command with the appropriate Display Status command or it can be handled by the CSI as a result of setting S91=1.

Display Character Codes

Characters that may be displayed are a subset of the ASCII character set. Table 8 is a list of the valid ASCII characters and the corresponding MDC codes that may be sent by the Central Office.

Network Command Reference

The hex codes listed in the following tables are the actual codes which are transmitted between the phone, CSI-380 and the Central Office. The CSI-380 reports these codes to the computer as a sequence of ASCII characters representing the code. For example, if the off-hook code 01C is sent by the telephone, the CSI-380 reports this as the three characters 0, 1 and C.

CSI-380 Initialization Commands

Keyboard Command	*Purpose*	*CSI-380 Response*
ATE0	Do not echo PC commands	OK
ATE1	Echo PC commands (Default)	OK
ATS90=0	No acknowledge (Default)	OK
ATS90=1	Acknowledge for phone	OK
ATS91=0	Do not support echo mode and TDS (Default)	OK
ATS91=1	Support echo mode and TDS	OK
ATS93=2	Initialize CSI-380	OK
ATS94=0	Normal Operation (Default)	OK
ATS94=1	Standalone Operation	OK
ATS94?	Request S-Register contents. Works with any ATS command.	(contents) OK

Table 1

Feature Key Codes Sent By the Telephone or Computer

Command	*Code*	*If sent by telephone*	*If typed at keyboard*
Feature Key 1	000	F1 key pressed at phone	F1 feature key code sent by computer
Feature Key 2	001	F2 key pressed at phone	F2 feature key code sent by computer
Feature Key 3	002	F3 key pressed at phone	F3 feature key code sent by computer
Feature Key 4	003	F4 key pressed at phone	F4 feature key code sent by computer
Feature Key 5	004	F5 key pressed at phone	F5 feature key code sent by computer
Feature Key 6	005	F6 key pressed at phone	F6 feature key code sent by computer
Feature Key 7	006	F7 key pressed at phone	F7 feature key code sent by computer
Feature Key 8	007	F8 key pressed at phone	F8 feature key code sent by computer
Feature Key 9	013	F9 key pressed at phone	F9 feature key code sent by computer
Feature Key 10	017	F10 key pressed at phone	F10 feature key code sent by computer

Table 2

Hookswitch and Dial Pad Codes Sent By Telephone or Computer

Command	*Hex Code*	*If sent by telephone*	*If typed at keyboard*
Off-hook	01C	Telephone has been taken off-hook	Computer has seized line
On-hook	01D	Telephone has been placed on-hook	Computer has released line
Dial Pad Key 1	008	Digit 1 dialed by phone	Digit 1 dialed by computer
Dial Pad Key 2	009	Digit 2 dialed by phone	Digit 2 dialed by computer
Dial Pad Key 3	00A	Digit 3 dialed by phone	Digit 3 dialed by computer
Dial Pad Key 4	00C	Digit 4 dialed by phone	Digit 4 dialed by computer
Dial Pad Key 5	00D	Digit 5 dialed by phone	Digit 5 dialed by computer
Dial Pad Key 6	00E	Digit 6 dialed by phone	Digit 6 dialed by computer
Dial Pad Key 7	010	Digit 7 dialed by phone	Digit 7 dialed by computer
Dial Pad Key 8	011	Digit 8 dialed by phone	Digit 8 dialed by computer
Dial Pad Key 9	012	Digit 9 dialed by phone	Digit 9 dialed by computer
Dial Pad Key 0	015	Digit 0 dialed by phone	Digit 0 dialed by computer
Dial Pad Key *	014	Digit * dialed by phone	Digit * dialed by computer
Dial Pad Key #	016	Digit # dialed by phone	Digit # dialed by computer
HOLD key	00B	HOLD key pressed at phone	HOLD key code sent by computer
RELEASE key	00F	RELEASE key pressed at phone	RELEASE key code sent by computer

Table 3

Indicator Signaling Codes Sent By the Central Office

Indicator No.	*Code*	*Purpose*
1	800	Indicator 1 Off
	820	Indicator 1 Wink
	840	Indicator 1 Flash
	860	Indicator 1 On
2	801	Indicator 2 Off
	821	Indicator 2 Wink
	841	Indicator 2 Flash
	861	Indicator 2 On
3	802	Indicator 3 Off
	822	Indicator 3 Wink
	842	Indicator 3 Flash
	862	Indicator 3 On
4	803	Indicator 4 Off
	823	Indicator 4 Wink
	843	Indicator 4 Flash
	863	Indicator 4 On
5	804	Indicator 5 Off
	824	Indicator 5 Wink
	844	Indicator 5 Flash
	864	Indicator 5 On
6	805	Indicator 6 Off
	825	Indicator 6 Wink
	845	Indicator 6 Flash
	865	Indicator 6 On
7	806	Indicator 7 Off
	826	Indicator 7 Wink
	846	Indicator 7 Flash
	866	Indicator 7 On
8	807	Indicator 8 Off
	827	Indicator 8 Wink
	847	Indicator 8 Flash
	867	Indicator 8 On
9	813	Indicator 9 Off
	833	Indicator 9 Wink
	853	Indicator 9 Flash
	873	Indicator 9 On
10	81E	Indicator 10 Off
	83E	Indicator 10 Wink
	85E	Indicator 10 Flash
	87E	Indicator 10 On

Table 4

Call Signaling Codes Sent By the Central Office

Command	*Code*	*Purpose*
Soft Reset	808	Reset telephone to Idle condition.
Save Indicator Reset	848	Reset telephone to Idle but do not turn indicators off.
Hard Reset	868	Reset telephone to Idle. Equivalent to power-up reset.
Alert On	86F	Start ringing the telephone
Alert Off	80F	Stop ringing the telephone
Buzzer On	86E	Turn on the telephone's buzzer
Buzzer Off	80E	Turn off the telephone's buzzer
Handset On	86D	Turn on the telephone's handset
Handset Off	80D	Turn off the telephone's handset
Voice On	86C	Turn on the telephone's line monitor
Voice Off	80C	Turn off the telephone's line monitor
Handsfree On	86B	Turn on the telephone's speaker and microphone
Handsfree Off	80B	Turn off the telephone's speaker and microphone
Open Echo Mode	869	Echo all commands back to Central Office except Reset and Close Echo Mode commands.
Close Echo Mode	809	Stop echoing commands from Central Office

Table 5

Display Status Codes Sent By the Telephone or Computer

Command	**Code**	**Purpose**
Display Status Normal	030	The phone or computer has not been reset since the last time Transmit Display Status was sent by the Central Office.
Display Status Reset	034	The phone or computer has been reset since the last time Transmit Display Status was sent by the Central Office.

Table 6

Display Signaling Codes Sent By the Central Office

Command	*Code*	*Purpose*
Clear Buffer	8A9	Clears the buffer of all character information.
Clear Display	8AD	Clears the buffer and the display of all character information.
Clear Buffer Line 1	889	Clears the top line of the buffer.
Clear Buffer Line 2	899	Clears the bottom line of the buffer.
Enable Digit Display Type 1	89B	Causes dialed digits to appear in the buffer at the current cursor location. At the first digit entry, clears the buffer and display, and sets the cursor to Line 2: Column 1. When Line 2 is filled, all digits are shifted left one position.
Enable Digit Display Type 2	8AB	Causes dialed digits to appear in the buffer at the current cursor location. At the first digit entry, clears Line 2 of the buffer and display, and sets the cursor to Line 2: Column 1. When Line 2 is filled, Line 1 is cleared and all digits are shifted left one position.
Clear Buffer in 12 Sec.	8B9	Cause the phone to clear its buffer after 12 seconds.
Disable Display Cursor	88C	Turns off the visible cursor.
Disable Display Echoing	88B	Sets phone to Normal Display Mode.
Disable Display	88D	Turns off the display. Characters in the buffer are not shown on the display.
Power Down Display	898	Turns off the display. Characters in the buffer are not shown on the display.
Enable Display	89D	Turns on the display. Any characters in the buffer are shown on the display.
Enable Display Cursor	89C	Turns on the visible cursor.
Display Reset	888	Buffer and display are cleared. Cursor is disabled and set to Line 1: Column 1. Normal Display Mode is used. Display is powered down.
Resume Digit Display	8BB	Resume digit display of the type most recently disabled.
Cursor to Line 1 Col 1	8A5	The cursor position is set to Line 1: Column 1.
Cursor to Line 2 Col 1	8B5	The cursor position is set to Line 2: Column 1.
Transmit Display Status	8B7	Transmit the current display status.

Table 7

Character Codes Sent By the Central Office

Char	*Meaning*	*ASCII*	*MDC Hex*
A	Uppercase A	41	E1
B	Uppercase B	42	E2
C	Uppercase C	43	E3
D	Uppercase D	44	E4
E	Uppercase E	45	E5
F	Uppercase F	46	E6
G	Uppercase G	47	E7
H	Uppercase H	48	E8
I	Uppercase I	49	E9
J	Uppercase J	4A	EA
K	Uppercase K	4B	EB
L	Uppercase L	4C	EC
M	Uppercase M	4D	ED
N	Uppercase N	4E	EE
O	Uppercase O	4F	EF
P	Uppercase P	50	F0
Q	Uppercase Q	51	F1
R	Uppercase R	52	F2
S	Uppercase S	53	F3
T	Uppercase T	54	F4
U	Uppercase U	55	F5
V	Uppercase V	56	F6
W	Uppercase W	57	F7
X	Uppercase X	58	F8
Y	Uppercase y	59	F9
Z	Uppercase Z	5A	FA
[	Left Bracket	5B	FB
****	Reverse Slant	5C	FC
]	Right Bracket	5D	FD
^	Circumflex	5E	FE
_	Underscore	5F	FF
SP	Space	20	C0
!	Exclamation Mark	21	C1
"	Quotation Mark	22	C2
#	Octothorpe	23	C3
$	Dollar Sign	24	C4
%	Percent Sign	25	C5
&	Ampersand	26	C6
'	Apostrophe	27	C7
(	Opening Parenthesis	28	C8
)	Closing Parenthesis	29	C9
*****	Asterisk	2A	CA
+	Plus Sign	2B	CB
,	Comma	2C	CC
-	Hyphen (Minus Sign)	2D	CD
.	Period	2E	CE
/	Slant (Slash)	2F	CF
0	Zero	30	D0
1	One	31	D1
2	Two	32	D2
3	Three	33	D3
4	Four	34	D4
5	Five	35	D5
6	Six	36	D6
7	Seven	37	D7
8	Eight	38	D8
9	Nine	39	D9
:	Colon	3A	DA
;	Semicolon	3B	DB
<	Less Than	3C	DC
=	Equals	3D	DD
>	Greater Than	3E	DE
?	Question Mark	3F	DF
@	Commercial At	40	E0

Table 8

Computer Command Reference

General

Command Line Structure

Command lines have the following structure:

```
HEADER - BODY - TERMINATOR
```

Command Header (AT)

All commands must be preceded by the letters AT. Upper or lower case is acceptable, but mixed case will not work.

Command Body

The command body is made up of one or more commands, each command having a command symbol and a parameter. Some commands may be invoked with others on the same command line. Some commands must be the only one on the command line. See the command list following.

Spaces

For readability spaces may be added to the command line between commands or anywhere in the D command. They are ignored.

Command Terminator (default is carriage return <RTN>)

Each command line must end with a command terminator. The terminator can be modified, but it defaults to ASCII `13d`, which is a carriage return or the ENTER key on a PC keyboard.

Maximum Length

The maximum length of the command line is 35 characters including header, body, spaces, and terminator.

EIA-602 Commands

AT

This is the command header. Issuing this by itself (no command body) will cause the CSI-380 to return the OK result code.

A/

The A/ command repeats the previously issued command. It may be repeated as many times as desired. No command terminator is necessary.

E

The E (echo) command turns on echoing of commands back to the computer. Enabled by E1, disabled by E0. Factory default is E1. Backed up in non-volatile memory.

Q

The Q (quiet) command turns off result codes. Enabled (no codes reported) by Q1, disabled by Q0. Factory default is Q0. Backed up in non-volatile memory.

V

The V (verbose) command sets result codes to text rather than digits. Enabled by V1, disabled by V0. Factory default is V1. Backed up in non-volatile memory.

SX=Y

The Sx=y command sets the contents of register x to value y. All S-Registers are backed up in non-volatile memory. The value must be specified in decimal.

SX?

The Sx? command returns the value of the specified register x in decimal format.

D

The D command is used to dial digits. If the line is on-hook, receipt of the D command will cause the CSI-380 to seize the line on the key specified by S81(AT_K) and wait for dial-tone. When dial-tone is detected, the specified digits are dialed. If the line is off-hook, receipt of the D command will cause the CSI-380 to dial the specified digits. The D may be followed by any combination of digits and other characters. All digits are dialed, a comma causes a pause, all other characters are ignored. If AT_K=0 has been issued, ATD will return the ERROR result code. This command must be the sole command on the command line, except for the T or P command if immediately after the D character.

```
E.g.:  ATD1 (800) 654-5604
       ATD1800654-5604
       ATD 9, 18006545604
```

H

The H (hookswitch) command controls line seizure. H0 goes on-hook, H1 goes off-hook. H1 goes off-hook on the line specified by S81(AT_K). H is the same as H0. Must be the sole command on the command line.

&F

Restores all non-volatile memory settings to the factory defaults.

P
No action.

T
No action.

Rochelle CTI Commands

_C0
Returns 372 capabilities in Rochelle CTI format.

_C1
Returns product code in Rochelle CTI format.

_C2
Returns firmware release date in Rochelle CTI format.

_C3
Returns maximum number of lines supported in Rochelle CTI format.

_C4
Returns Rochelle CTI message types supported.

_R0=n
Output Register mode command. When n = 0, *372* provides notification of network events on a polled basis via the _Sn command. When n = 1, *372* provides notification of network events on an interrupt basis. Factory default is n = 0. Backed up in non-volatile memory.

_Sn
Provide status for line n. If n = 0 , provides status for all lines.

CCI-372 Specific Commands

_P=
Set PDN line definitions. Must be the sole command on the command line. Setting can be read via S83.

_M=
Set MADN line definitions. Must be the sole command on the command line. Settings can be read indirectly via S82and S83.

_K=
Set dialing key definition. Must be the sole command on the command line. Setting can be read via S81.

^XXX
Send xxx MDC code to the network. Must be the sole command on the command line.

S-Registers

Register	*Description*	*Default*
3	Command Terminator	13d
4	Line Feed character	10d
5	Backspace character	8d
6	Wait for dialtone in seconds before NO DIALTONE result code is issued.	2d
8	Pause time for comma character in ATD command	2d
81	The line key to dial out on. Read Only.	1d
82	The line appearance definitions. Binary 1 means line key defined. Right-most bit is Key 1. Read Only.	0000 0001b
83	The line type definitions. Binary 0 means MADN for that line key. Binary 1 means PDN for that key. Right-most bit is Key 1. Read Only.	0000 0000b
90	MDC addresses to send acknowledgements to. Right-most bit is address 0.	0000 0000b
91	MDC addresses to respond to echo mode and TDS commands. Right-most bit is address 0.	0000 0000b
92	Delay between transmitted MDC messages. Delay is: *1 / (0.0005 x Delay_value + 0.018) messages/sec*	255d
93	Format of raw MDC message reporting. (CSI-380 only; 0 in 372) 0 - No messages reported 1 - All messages reported with control bits 2 - Valid messages reported with no control bits. Open Echo, Close Echo, Transmit Display Status not reported. Messages received on supported open echo channel not reported.	0d
94	Enable Standalone mode. Set to 0 for p-phone attached. Set to 1 for CLT-383 (Dees Centrex line terminator) attached.	0d
95	The time from the last MDC character received to when the indicator goes to **flashing** or to **on**, when the display characters come before the indicator command: *EARLY_ICLID_TIME* = (*value* x 0.02) seconds	50d
96	The time from when the indicator goes to **flashing** or to **on** to when the first MDC character is received, when the indicator command comes before the display characters: *LATE_ICLID_TIME* = (*value* x 0.02) seconds	125d
97	The maximum time between display characters before the 372 considers the display sequence complete: *INTER_ICLID_TIME* = (*value* x 0.02) seconds	25d

Table 9

Command Result Codes

Responses to commands are one of three result codes:

```
0 - OK
2 - ERROR
6 - NO DIALTONE
```

The V command may be used to choose digit or text result codes.
The Q command may be used to disable the sending of result codes.

Unsolicited Event Messages

Unsolicited event messages are a part of the Rochelle CTI command set. Two message types exist:

CND Event Message

This message reports the calling number and name if available, and the line number the call came in on. The line number may be 1 to 8 and must be deferred by the **_P=** command. The message format is:

```
+1,<number>,<name>,<line>
```

Line Status Event Message

This message reports line status changes. The line number may be 1 to 8 and must be defined by the **_P=** command. The message format is:

```
+2,<new status>,<line>
```

where <new status> will be one of the following:

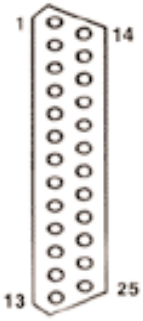
```
0 - line is idle
1 - line is ringing, ringing period
2 - line is ringing, silent period
3 - line is off-hook on incoming call
4 - line is off-hook on outgoing call
```

Connector Pinouts

RS-232C Connector

PC COM port serial interface

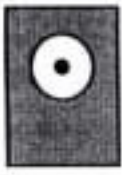
DB25 Socket



1	Shield Ground	
2	Transmit Data	*To CSI-380*
3	Receive Data	*From CSI-380*
4	Request to Send	*To CSI-380*
5	Clear to Send	*From CSI-380*
6	Data Set Ready	*Tied to 8, 20*
7	Signal Ground	
8	Carrier Detect	*Tied to 6, 20*
20	Data Terminal Ready	*Tied to 6, 8*

Power Connector

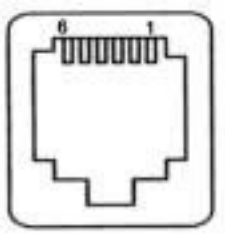
Barrel Connector: 2.5 mm Pin; 5.5 mm OD; Center-negative



Inner Conductor	-24 Vdc
Outer Conductor	Ground

Line Connector

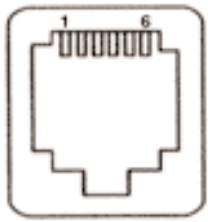
Modular Jack: 6 position; 6 conductor; RJ25



1	Set Connector Pin 1
2	Set Connector Pin 2
3	Tip
4	Ring
5	Set Connector Pin 5
6	Set Connector Pin 6

Set Connector

Modular Jack: 6 position; 6 conductor; RJ25



1	Line Connector Pin 1
2	Line Connector Pin 2
3	Ring
4	Tip
5	Line Connector Pin 5
6	Line Connector Pin 6

Warranty and Service

Dees Communications Corporation warrants equipment manufactured by it to be free from defective material and workmanship for a period of one year. At its option, Dees shall replace or repair such equipment, which under normal use and service, discloses such defects. This warranty shall not apply to fuses. Equipment under warranty shall be returned to Dees' designated facility, transportation prepaid by the purchaser, for inspection by Dees, whose opinion as to defects shall be conclusive.

The warranty period shall commence on the date of shipment which shall be deemed to be the date of final calibration marked on the equipment.

This warranty period shall be void as to any products which have been repaired, worked upon or altered by persons not authorized by Dees, or which have been subject to misuse, negligence, accident or abnormal conditions of operations, i.e., lightning, earthquake, tornado. In all such cases, such repairs shall be billed at a nominal cost, and an estimated charge will be provided before work is begun. This warranty shall not apply to any of our products which have been connected, installed, used or adjusted otherwise in accordance with the instructions furnished by us. Such units shall be returned to the customer.

If you experience problems while installing this product, or if this product stops functioning, please call Dees Technical Support. If the problem cannot be resolved on the phone, return the product(s) to Dees.

A material return authorization number must be secured prior to return shipment by calling Dees.

You can reach Technical Support by calling the following number:

1-800-654-5604

Repair returns should be accompanied by a complete description regarding the nature of the defect. All return shipments must be properly packed in protective containers with identification of the sender and return authorization number on the carton.

A repair charge will be assessed on units returned for repair after expiration of the warrant period. A service and handling charge will be assessed on units returned to Dees and found not to be defective.

Repaired units are warranted for 90days or the remaining period of the original warranty, whichever is greater.

In all instances, Dees retains the option of updating returned products to current technological standards in component or circuitry, conditioned on no change of features, functions or compatibility with approved units.

Regulatory Notes

FCC Requirements

1. The Federal Communications Commission (FCC) has established Rules which permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment should not be used on party lines or coin lines.

2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. The telephone company may make changes in its technical operations and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes. You will be advised of your right to file a complaint with the FCC.

4. If the telephone company requests information on what equipment is connected to their lines, inform them of:

a. The telephone number this unit is connected to
b. The ringer equivalence number
c. The USOC jack required
d. The FCC registration number

Items 'b' and 'd' are indicated on the label.

Service Requirements

In the event of equipment malfunction, all repairs should be performed by our Company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our Company or to one of our authorized agents. Service can be obtained by contacting Dees Communications:

```
1-800-654-5604
Support@dees.com
```

Warning

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'emet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Reglement sur le brouillage radioélectrique édicté par le ministere des Communications du Canada.

Equipment Attachment Limitations

Notice
The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution
Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Note
a. Never install telephone wiring during a lightning storm.
b. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
c. Never touch uninsulated telephone wires or terminals unless telephone line has been disconnected at the network interface.
d. Use caution when installing or modifying telephone line.

Dees Communications Corporation
Tel: 1-800-654-5604
Fax: 1-888-474-7197
www.dees.com

Printed in Canada 95.139.02D 02.16