IP Office

AT Commands

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Table of Contents

Using AT Commands

Introduction

This document explains how to configure and use the Terminal Adapter (TA) functionality of an IP Office Control Unit.

The TA functionality is achieved by connecting a Terminal (or a PC running Terminal Emulation Software) to the DTE port of the Control Unit and then issuing AT commands.

The AT command must be entered in a specific format to be recognised and executed. Each command begins with the letters **AT** (Attention), which are then followed by a sequence of letters, numbers and symbols. Each command is terminated by a carriage return (the **Return** or **Enter** key).

Command Mode.

The DTE ports has two modes; Command Mode and Data Transfer Mode. The port only accepts AT commands when it is in AT Command Mode.

This occurs when the unit is first power up, when it is in an unconnected state or after the Escape Sequence is entered in the Data Transfer mode.

If **AT** is entered when the port is in Command Mode, the response "**OK**" is given.

Escape Sequence.

When the DTE port is in the Data Transfer mode, the Escape Sequence returns it to Command Mode. The default Escape Sequence consists of a one second pause, three **+++** characters and then another one second pasue.

The pause length before and after the escape charactes is set by **ATS12**. The escape characters set by **ATS2** command.

The **ATO** command returns the DTE port back into Data Transfer Mode.

The Escape Sequence can be disabled using ATS2=128. This prevents any false escapes into Command Mode during Data Transfer Mode.

Configuration Profiles (ATZn, AT&Fn and AT&Wn).

The Control Unit allows configuration parameters to be stored in 3 different profiles (0, 1 and 2). At reboot these profiles all have default values.

To save the port's current configuration settings to one of the profiles the **AT&Wn** command should be used. To load the configurations settings from a particular profile use the **ATZn** command. To return a profile back to the default settings use the **AT&Fn** command.

- **Note:**
  All profiles return to default values after a reboot. See Setting Default AT Settings for a method of automatically issuing AT commands whenever the Control Unit reboots.

DTE Port Connection Settings

Access to the DTE port requires a serial cable supplied by Avaya. You also require an asynchronous terminal program or terminal device.

The default port settings are:

- **Bits per second:** 38400.
- **Data Bits:** 8.
- **Parity:** None.
- **Stop Bits:** 1.
- **Flow Control:** None.
- **Emulation:** TTY or VT100.

Setting Default AT Settings

DTE port settings entered using AT commands are not saved as part of the Control Unit's flash memory. Therefore they are lost whenever the Control Unit is rebooted.

In order to issue a set of AT configuration commands each time the Control unit is rebooted, a user called '**DTEDefault**' should be created using the Manager application. The settings required can then be entered as AT commands in that user's SourceNumbers table.

Monitoring DTE Port Usage

The Monitor application can be used to display activity on the DTE port. Selecting **Settings | DTE** and then **DTE Command Tx** and **DTE Command Rx** to display AT commands.

AT Commands

Summary of AT Commands

The table below lists the AT commands within this manual.

Command	Description	Possible Values	Default
ATA	Answer call.	-	-
ATBn	Set mode.	0 = PPP 1 = MLPPP 2 = V120 - Normal 3 = V110 4 = V120 - UI first	0
ATD	Dial.	-	-
ATE	Echo.	0 = Off. 1 = On.	1
ATH	Hang up call.	-	-
ATI	Display TA Information.	-	-
ATO	Resume session.	-	-
ATSn	S-register configuration.	See ATS - S-Register Configuration.	-
ATVn	Set Response Mode.	0 = Digital 1 = Verbose.	1
ATZn	Load profile.	0, 1 or 2.	0
AT&A	Set AutoCall destination.	-	-
AT&Bn	Set Bearer Capability.	0 = Digital. 1 = Speech. 2 = 56k/V.110.	0
AT&Cn	DCD behaviour.	0 = Always on. 1 = Follows call. 2 = Pulse disconnect.	1
AT&Dn	DTR action.	0 = Ignore. 1 = AutoDial destination. 2 = Drop call. 3 = Drop and reset.	2
AT&Fn	Set Profile to Default Values.	0, 1, 2 or (none). (none) = current settings.	
AT&Hn	Flow control.	0 = None. 3 = RTS/CTS. 4 = XON/XOFF.	3
AT&Rn	Baud Rate.	DTE speed (bps). 0 = AutoBaud.	0
AT&Sn	DSR behaviour.	0 = Always on. 1 = Follows call.	0
AT&Vn	V.110 Rate.	0 = 38400 bps. 1 = 19200 bps. 2 = 9600 bps. 3 = 4800 bps.	2
AT&Wn	Save current configuration.	0, 1 or 2.	0
AT*An	Multi-link bandwidth mode.	0 = Permanent. 1 = On demand.	1
AT*Bn	Multi-link BACP mode.	0 = Off. 1 = On.	0

ATA - Answer Call

The Auto Answer function is controlled via the **ATA** and the **ATS0** commands.

The **ATA** command allows the incoming call to be answered manually.

The **ATS0** command sets the number of rings detected before the unit will answer the incoming call. The value of **ATS0** should be set to any value between 1 and 127. Setting **ATS0** to 0 disables Auto Answer.

ATBn - Set Mode

The **ATBn** command is used to set the way in which the data received and transmitted on the ISDN link is structured.

- **ATB0 - Point to Point Protocol (PPP)** ***(Default)***
  Sets the link protocol to PPP. This is used when the remote end of the link only allows one connection per user.
- **ATB1 - Multi Link Point to Point Protocol (MLPPP)**
  Sets the link protocol to MLPPP. This is used when the remote end of the link allows multiple simultaneous connections from the same source.
- **ATB2 - V.120 (Numbered Datagrams)**
  Sets the link protocol to V.120 (Numbered datagrams). V.120 is a standard rate adaptation mechanism used by TA's to convert asynchronous data, received from the PC, to synchronous data on the ISDN connection.
- **ATB3 - V.110**
  Sets the link protocol to V.110. V.110 is also a rate adaptation mechanism. Its main use is for data connections over the GSM Network.
- **ATB20 - V.120 (Un-numbered datagrams)**
  Sets the link protocol to V.120 (un-numbered datagrams). This option should be used if it is not possible to establish a V.120 connection using ATB2.

ATD - Dial

The **ATD** command causes the Control Unit to dial a number. Spaces, hyphens, parenthesis or other punctuation can be interspersed with the number to be dialled to make the command easier to read. For example the following **ATD** commands are all valid :-

```
ATD 01923 123456
ATD 01923-123456
ATD (01923)123456
```

- **Note**:
  To place calls to destinations which use sub-addressing, @ is used. For example ATD 01923 123456@01 where "01" is the destination sub-address.

ATE - DTE Character Echo

This command instructs the DTE port whether to echo characters received whilst in the command mode.

- **ATE0 - Disable character echo**
- **ATE1 - Enable character echo** ***(Default)***

ATH - Hang Up

The **ATH** command is used to disconnect a call in progress. To disconnect a call, escape to the command mode and type in **ATH**. The Control Unit will terminate the connection and hang up the call.

ATI - Information

This command is used (mainly by Plug and Play utilities) to obtain product information.

- **ATI0** - displays the product number.
- **ATI1** - outputs the string "Network Alchemy Ltd."
- **ATI2** - displays the product description.
- **ATI3** - displays the version string.
- **ATI9** - displays the product's plug and play ID.

ATO - Resume Session

Once the Control Unit establishes a call it enters Data Transfer Mode in which it is ready to send and receive data.

Normally the unit remains in this mode until either the call is terminated or the terminal sends the escape sequence. If the latter occurs then the DTE port is placed in Command Mode. The unit can be returned back to Data Transfer mode using the **ATO** command.

ATS - S-Register Configuration

S-registers contain values that determine how the TA operates.

- To display the value in S-register "x" use the command **ATSx**.
- To alter the value of S-register "x" use the command **ATSx=n**.

The table below lists the S-registers supported.

Register	Description	Possible Values	Default Value
S0	Auto-Answer.	Range: 0 - 255 (0 = Disabled)	0
S1	Ring counter (Read only).	-	-
S2	Escape character.	Range: 0 - 127 (0 = Disabled)	43 (+)
S3	Carriage Return character.	Range: 0 - 127	13
S4	Line Feed character.	Range: 0 - 127	10
S5	Back Space character.	Range: 0 - 127	8
S7	Dial timeout.	Range: 1 - 255 secs. Measured in secs.	30 (30 sec)
S10	DCD pulse length.	Range: 1 - 255 Measured in 1/10 sec.	14 (1.4 sec).
S12	Guard time.	Range: 0 - 255 Measured in 1/50 sec.	50 (1.0 sec).

ATVn - Set Response Mode

Some PCs require the DTE port's Response Mode to be set to digital, but verbose mode is easier for the user to interpret and understand.

In verbose mode typical port responds are "OK" and "Error". In digital mode the same responses become "01" and "04".

- **ATV0 - Digital Mode**
- **ATV1 - Verbose Mode *(Default)***

ATZ - Load Profile

ATZn command is used to load the port's settings with those stored in profile **n** (see AT&Wn - Save Current Configuration).

For example **ATZ2** loads port with the settings stored in profile 2.

AT&A - Set AutoCall Destination

This command is used in conjunction with the **AT&D1** command (see AT&Dn - DTR Action) to auto-dial a number when required.

The **AT&A** command is used to store the destination number. The destination number is entered using the following formats:-

```
AT&A01923123456
AT&A=01923123456
```

The current stored number can be viewed by entering an **AT&A?** command.

AT&Bn - Bearer Capability

This command sets the units Bearer Capability. The Control Unit sends the Bearer Capability Mode to the ISDN Switch when the unit initiates an outgoing call. The Mode setting should mirror that set at the remote end of the link.

The options are:

- **AT&B0 - Digital Mode (Data) *(Default)***
- **AT&B1 - Speech Mode (3.1 kHz audio)**
- **AT&B2 - V.110 Mode (V.110)**

AT&Cn - DCD Behaviour

This command controls the DCD output (DTE port pin 8). There are three choices:

- **AT&C0 - DCD always ON**
  The DCD output pin is always forced on regardless of the call state.
- **AT&C1 - Follow Call *(Default)***
  DCD is in the off state until the Control Unit detects and establishes an incoming call.
- **AT&C2 - Pulse Disconnect**
  DCD is always forced on except during the call disconnect sequence, where it is pulsed off. The DCD off pulse time is controlled by S-register 10.

AT&Dn - DTR Action

This command monitors the status of the DTR input (DTE port pin 20) and acts as follows:

- **AT&D0 - Ignore**
  The status of the DTR control signal is ignored.
- **AT&D1 - Auto Dial Destination**
  The number stored in the unit with the **AT&A** command is automatically dialled when DTR is on.
- **AT&D2 - Drop Call *(Default)***
  When the DTR changes from the on to off, any call in progress is dropped.
- **AT&D3 - Drop Call and Reset**
  When DTR changes from the on to off, any call in progress is dropped and the unit is then reset.

AT&Fn - Default Configuration

Use the **AT&Fn** command to load profile **n** with default settings. If **n** is omitted then the current DTE port settings are set to default.

AT&Hn - Flow Control

This command controls the flow of data between the attached TA and the DTE port. This is parameter is important when the speed of the asynchronous connection between the TA and DTE port is greater than the speed of the link to the remote site.

The flow control option regulates the flow of data between the TA and the Control Unit ensuring that there is no loss of data due to the differing speeds.

- **AT&H0 - No Flow Control**
- **AT&H3 - RTS/CTS Flow Control *(Default)***
  Also known as Out of Band or Hardware Flow Control.
- **AT&H4 - XON/XOFF Flow Control**
  Also known as In Band or Software Flow Control.

AT&Rn - DTE Baud Rate

This command sets the speed at which the attached TA communicates with DTE port. **AT&R0** (the default) can be used for automatic speed and parity detection.

AT&Sn - DSR Behaviour.

This command sets the functionality of the DSR output (DTE port pin 6).

- **AT&S0 - Always On *(Default)***
  DSR is always on, whether there is a call in progress or not.
- **AT&S1 - Follow Call**
  DSR is on only while a call is in process. When **AT&S1** is used the DSR control signal is off until the Control Unit begins the call connect sequence, then remains on until the call is dropped.

AT&Vn - V.110 Rate

This command sets the V.110 Rate Adaption speed which is to be used on the ISDN link.

- **AT&V0 - 38k4 bps**
- **AT&V1 - 19k2 bps**
- **AT&V2 - 9600 bps *(Default)***
- **AT&V3 - 4800 bps**

AT&Wn - Save Current Configuration

This command is used to save the current port settings to profile 0, 1 or 2. If no profile is specified then the settings are saved to profile 0.

AT*A - Multi-Link Bandwidth Mode

This command controls the method of multi-link bandwidth attempted.

- **AT*A0 - Maintain Two Calls**
  Forces the Control Unit to try to maintain two calls to the required destination permanently
- **AT*A1 - Add Second Call When Required *(Default)***
  Add a second link only when the amount ofdata being transferred requiresadditional bandwidth

AT*B - Multi-Link BACP Mode

This command control whether the unit requests additional bandwidth via the PPP Bandwidth Allocation Protocol.

- **AT*B0 - Disable BACP Mode *(Default)***
- **AT*B1 - Enable BACP Mode**
  Request additional bandwidth via PPP Bandwidth Allocation Protocol.

Index

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