

Application Note

Product: Freeset DCT1900/1900+ Standalone RE
Purpose: T-1 CAS Integration with Avaya G3i and S8400
Date: June 11, 2007

Ascom Standalone Freeset Radio Exchange Integration with Avaya Definity G3i PBX and S8400 via T-1 Interface

This document outlines the steps necessary to integrate the Ascom Freeset DCT1900+ wireless system with an Avaya Definity G3i or an Avaya S8400 PBX. The configurations listed below do not include voice mail coverage parameters. This document is for the use of someone familiar with both the Avaya Definity G3i / S8400 as well as the Ascom Freeset systems. It can serve as a reference to the Avaya system administrator and the Freeset installation technician as a guide to the interface. It is not written for use by parties not familiar with the systems.

Background Information:

There are two methods for the RE to draw dial tone from the PBX. The first method is by using individual analog extensions from the PBX to the RE. This requires one PBX port wired to one RE port per user. The second method, using digital T1 ports between the RE and PBX, requires one PBX port and one RE port per 24 users; however, each extension must be assigned to an individual channel in the PBX and associated with each Freeset user. This document will only cover the digital (T1) method of interconnection.

In the example to follow, a single RE is connected to the PBX using two T1 circuits supporting 48 total wireless extensions.

Hardware Requirements:

RE

Qty 1, T-1 DTU-CAS Interface Card per 48 Wireless Users (Each card has 2 T-1 Ports)

Qty 1, T-1 Cable per Card (Ascom Part no. TSRNB 101 50)

Color	Function
White/Blue	Receive Data Port 1
Blue/White	Receive Data Port 1
White/Orange	Transmit Data Port 1
Orange/White	Transmit Data Port 1
White/Green	Receive Data Port 2
Green/White	Receive Data Port 2
White/Brown	Transmit Data Port 2
Brown/White	Transmit Data Port 2
Shield	Ground

Qty 1, Punch-down Block to Interconnect T-1 from PBX

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PBX

Qty. 1, T-1 DS1 Circuit Pack

G3i : One Avaya TN767E or TN464F per 24 Wireless Users (Each card has a single T-1 Port).
One T-1 Amphenol Adapter per card, Ortronics OR-8120M Adapter Cable, 50-foot, T1, solid, 24-26ga, 2-pair, individually shielded pair PVC insulated, RJ45 connector on one end, other end blank.
Per EIA/TIA 568B (Avaya PDS) pinout.

Note: for TN464 circuit board, set the option switches on the component side of the board to T-1 (1.544), 120 ohm connection.

S8400 : One circuit pack MM710 per T-1 port
One RJ45 connector, pins 1,2 and 4,5 connected to a CAT5 cable for termination to a punch block.

<u>RJ45 Pin</u>	<u>Color</u>	<u>Function</u>
1	White/Blue	Receive Data
2	Blue/White	Receive Data
4	White/Orange	Transmit Data
5	Orange/White	Transmit Data

Shield is not connected to any RJ45 pin on PBX-end.

DID Analog PBX Extension Terminated to RJ11 for RE Diagnostic Modem

T-1 Hardware Interconnections at Punchdown Block:

PBX (1 T1/Card)

RE (2 T1's/Card)

PBX Card 1

RE Card 1

White/Blue
Blue/White
White/Orange
Orange/White

White/Orange
Orange/White
White/Blue
Blue/White

PBX Card 2

White/Blue
Blue/White
White/Orange
Orange/White

White/Brown
Brown/White
White/Green
Green/White

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Ascom Freeset Jumper and Software Settings:

CPU Board:

Frame Synchronization = MASTER
Frame Timing – Synchronize to DTU Link (T-1)

T-1 Board:

Cable Length = 0-164 ft. (set to distance between RX and PBX) Set for Each Port

Software Settings for Cordless System Manager for RE:

Interface Selection = T-1
Framing Format = Extended (for Extended Superframe), or Superframe
Line Coding Format = B8ZS or AMI-ZCS
Speech Encoding = MULAW or ALAW (according to H/W)

Avaya T-1 Parameters:

The same commands are used on the G3 and S8400.

Signaling Mode = robbed-bit

These settings should match in the RE:

Line coding may be either b8zs or ami-zcs.

Framing can be either esf or d4

Interface Companding should match RE system type (mulaw or alaw)

Normally, Line Coding AMI and D4, or B8ZS and ESF

command: **add ds1 1d19** (1d19 is the slot number where this example T-1 board is located).

DS1 CIRCUIT PACK

Location:	01D19	Name:	WIRELESS-1
Bit Rate:	1.544	Line Coding:	ami-zcs
Line Compensation:	1	Framing Mode:	d4
Signaling Mode:	robbed-bit		

Interface Companding: **mulaw**
Idle Code: 11111111

MAINTENANCE PARAMETERS

Slip Detection? n Near-end CSU Type: other

Comments:

Note that the Line Compensation value is "1" in this case due to the RE being located in the same room with the PBX. Consult the Avaya documentation for other distance ranges. Valid entries are 1 through 5.

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Other RE Customization Settings Required with Cordless Manager Software:

Initialization Parameters

Hookswitch Flash Method:
Hook Flash Method = F (Flash)
Differential Ringing = Y (Yes)
Hookflash length and Min Ring pulse timer = 120/100 or 520/100 (PBX dependent)
Wait for Dial Tone = T (tone Detection)

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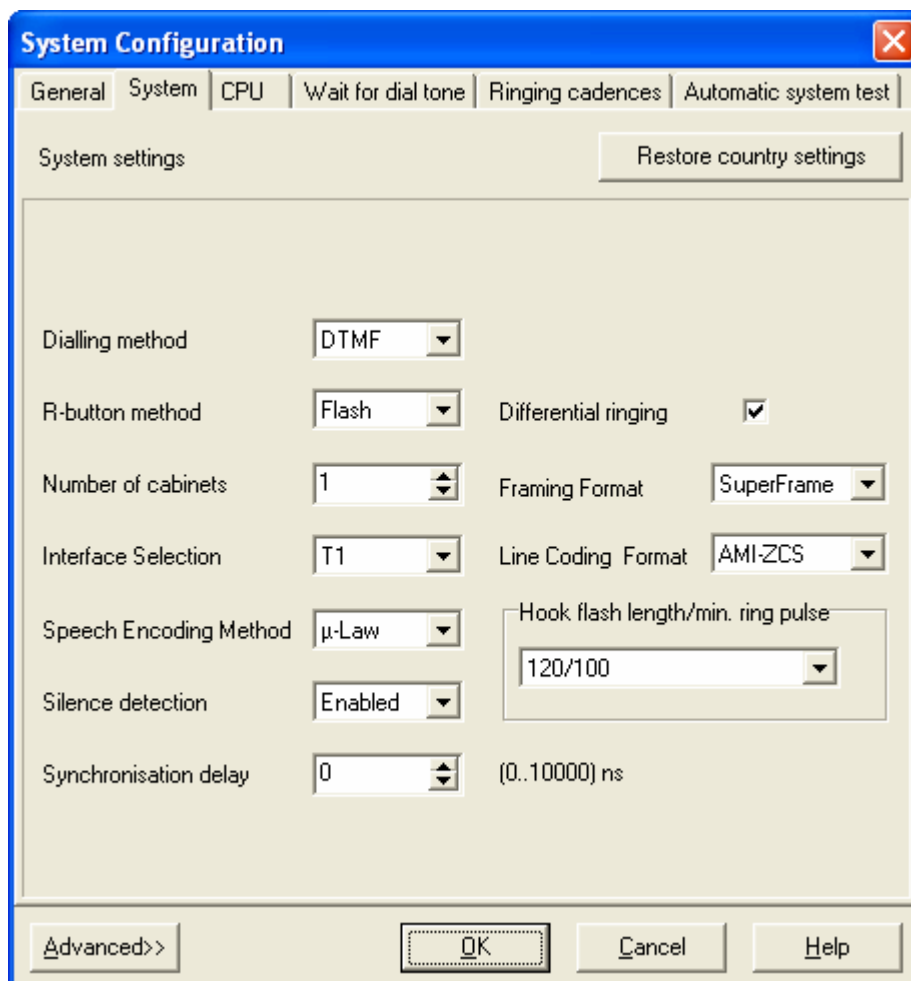
Freeset Setup

Setting RE T-1 Parameters:

System Configuration:

- Select Interface Selection = T1
- Set Speech Encoding according to HW type (u-law or a-law)
- Set Framing Format to match PBX (Superframe = d4, Extended = ESF)
- Set Line Coding to match PBX (AMI-ZCS or B8ZS)

Note: Normally, when using d4 (SuperFrame), the coding is usually AMI-ZCS. When using Extended (ESF), the coding is usually B8ZS



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Setting the RE Ring Cadence Detection:

Use the following settings for the ring cadences on the RE Configuration:

Internal: 1 on = 1000, 1 off = 4340

External: 1 on = 460, 1 off = 220, 2 on = 400, 2 off = 5000

Call Back: 1 on = 220, 1 off = 120, 2 on = 220, 2 off = 120, 3 on = 420, 3 off = 3300

Repetitive Pattern = ticked

System Configuration

General | System | CPU | Wait for dial tone | Ringing cadences | Automatic system test

Ringing cadences settings (On/Off time in ms) Clear All

	1 On	1 Off	2 On	2 Off	3 On	3 Off	4 On	4 Off
Internal	1000	4340						
External	460	220	400	5000				
Call back	220	120	220	120	420	3300		
4								
5								
6								
7								
8								

Repetitive pattern synchronised with incoming call

Advanced>> OK Cancel Help

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Setting PBX Personality – PBX Features:

From the PBX, determine the call feature codes set for the particular site. Issue the following command on the PBX:

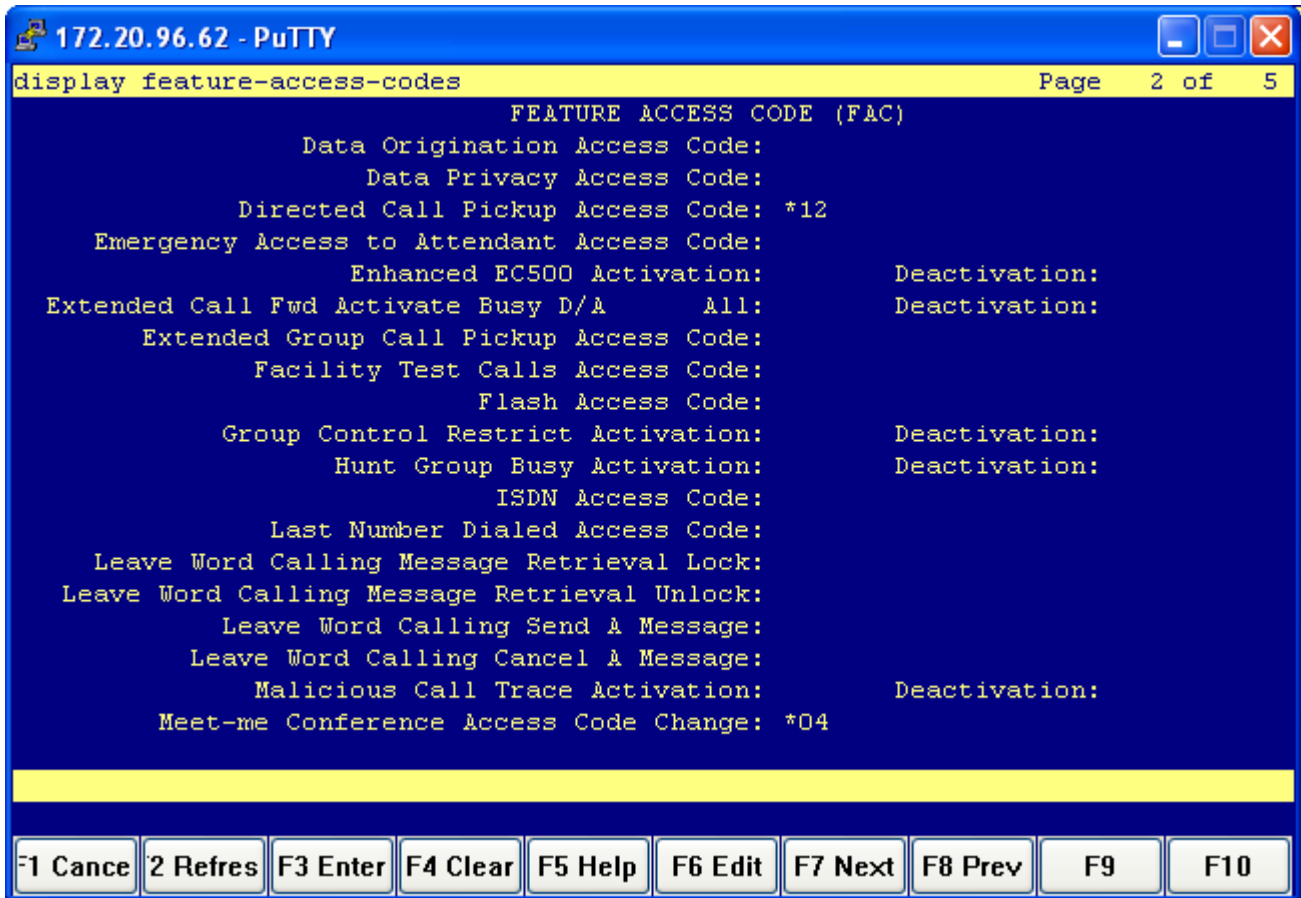
display features

```
172.20.96.62 - PuTTY
display feature-access-codes Page 1 of 5
FEATURE ACCESS CODE (FAC)
Abbreviated Dialing List1 Access Code:
Abbreviated Dialing List2 Access Code:
Abbreviated Dialing List3 Access Code:
Abbreviated Dial - Prgm Group List Access Code:
Announcement Access Code:
Answer Back Access Code: *05

Auto Alternate Routing (&AR) Access Code:
Auto Route Selection (&RS) - Access Code 1: 9 Access Code 2: *99
Automatic Callback Activation: *01 Deactivation: #01
Call Forwarding Activation Busy/DA: *07 All: *08 Deactivation: *09
Call Park Access Code: *10
Call Pickup Access Code: *11
CAS Remote Hold/Answer Hold-Unhold Access Code: *02
CDR Account Code Access Code:
Change COR Access Code:
Change Coverage Access Code:
```

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The screenshot shows a PuTTY terminal window titled "172.20.96.62 - PuTTY". The terminal displays the command "display feature-access-codes" and its output, which is a list of feature access codes (FAC) and their activation/deactivation status. The output is as follows:

```
FEATURE ACCESS CODE (FAC)
Data Origination Access Code:
Data Privacy Access Code:
Directed Call Pickup Access Code: *12
Emergency Access to Attendant Access Code:
Enhanced EC500 Activation:           Deactivation:
Extended Call Fwd Activate Busy D/A All: Deactivation:
Extended Group Call Pickup Access Code:
Facility Test Calls Access Code:
Flash Access Code:
Group Control Restrict Activation:     Deactivation:
Hunt Group Busy Activation:           Deactivation:
ISDN Access Code:
Last Number Dialed Access Code:
Leave Word Calling Message Retrieval Lock:
Leave Word Calling Message Retrieval Unlock:
Leave Word Calling Send A Message:
Leave Word Calling Cancel A Message:
Malicious Call Trace Activation:      Deactivation:
Meet-me Conference Access Code Change: *04
```

At the bottom of the terminal window, there is a row of function key buttons: F1 Cancel, F2 Refres, F3 Enter, F4 Clear, F5 Help, F6 Edit, F7 Next, F8 Prev, F9, and F10.

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Adding Extension Numbers to RE/PBX:

1> Determine the DIAL PLAN. Extension numbers can be assigned one-at-a time or assigned as a range. It's more convenient to assign them as a range.

2> Add the extension to the PBX in a similar way to any other analog extension; however, the extension port will be any available channel (1 through 24) on the T-1 interface(s) to the RE.

Here is an example of an extension:

Command: `display station 5290`

Page 1

```
172.20.96.62 - PuTTY
display station 5290 Page 1 of 3
STATION
Extension: 5290          Lock Messages? n      BCC: 0
Type: 2500             Security Code:        TN: 1
Port: 01A0901         Coverage Path 1:     COR: 1
Name:                 Coverage Path 2:     COS: 1
                    Hunt-to Station:    Tests? y

STATION OPTIONS
      Loss Group: 4          Message Waiting Indicator: none
Off Premises Station? y
R Balance Network? n

F1 Cancel F2 Refres F3 Enter F4 Clear F5 Help F6 Edit F7 Next F8 Prev F9 F10
```

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Page 2

```
172.20.96.62 - PuTTY
display station 5290 Page 2 of 3
STATION
FEATURE OPTIONS
LWC Reception: spe
LWC Activation? y Coverage Msg Retrieval? y
LWC Log External Calls? n Auto Answer: none
CDR Privacy? n Data Restriction? n
Redirect Notification? y Call Waiting Indication? y
Per Button Ring Control? n Att. Call Waiting Indication? y
Bridged Call Alerting? n Distinctive Audible Alert? y
Switchhook Flash? y Adjunct Supervision? y
Ignore Rotary Digits? n
H.320 Conversion? n Per Station CPN - Send Calling Number?
Service Link Mode: as-needed
Multimedia Mode: basic

Coverage After Forwarding? s
Direct IP-IP Audio Connections? y
Emergency Location Ext: 5290 IP Audio Hairpinning? y

F1 Cancel F2 Refres F3 Enter F4 Clear F5 Help F6 Edit F7 Next F8 Prev F9 F10
```

Here are some important notes:

- 1> Off-Premise Station **must** be chosen when an extension is assigned to a T-1 port (Display Station, page 1).
- 2> Audible Message Waiting must be YES if a site has Audix. This provides a “stutter” dial tone when the user has a message waiting. The message-waiting indicator on the Freeset is not compatible with the Definity PBX.
- 3> Other parameters such as call-waiting, etc. are optional by site/user.

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Simultaneous Ringing of Freeset Phone with PBX Analog Phone:

This requires special settings on the user's main analog (wired) phone on the Definity translation. This feature is only available with Definity G3I v4 or later:

STATION

Extension:	3492		TN:	1	
Type:	2500	Lock Messages?	n	COR:	1
Port:	01B0706	Security Code:		COS:	1
Name:	Smith, John	Coverage Path:		Tests?	Y

FEATURE OPTIONS

LWC Reception:	msa-spe		
WC Activation?	y	Coverage Msg Retrieval?	y
CDR Privacy?	n	Auto Answer:	none
Redirect Notification?	y	Data Restriction?	n
Per Button Ring Control?	n	Call Waiting Indication?	y
Bridged Call Alerting?	y	Att. Call Waiting Indication?	y
Off Premise Station?	n	Distinctive Audible Alert?	y
Switchhook Flash?	y	Message Waiting Indicator:	
Ignore Rotary Digits?	n	Adjunct Supervision?	y
Audible Message Waiting?	N		

Thus, Bridged Call Alerting = y must be set.

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The translation for the Freeset port to be bridged also changes, here is an example:

STATION

Extension:	4704		TN:	1	
Type:	2500	Lock Messages?	n	COR:	1
Port:	01D1904	Security Code:		COS:	1
Name:	SMITH, JOHN W	Coverage Path:		Tests?	y

FEATURE OPTIONS

LWC Reception:		msa-spe	
LWC Activation?	y	Coverage Msg Retrieval?	y
CDR Privacy?	n	Auto Answer:	none
Redirect Notification?	y	Data Restriction?	n
Per Button Ring Control?	n	Call Waiting Indication?	y
Bridged Call Alerting?	y	Att. Call Waiting Indication?	y
Off Premise Station?	y	Distinctive Audible Alert?	y
Switchhook Flash?	y	Message Waiting Indicator:	
Ignore Rotary Digits?	n	Adjunct Supervision?	y
R Balance Network?	n		
		Audible Message Waiting?	N

SITE DATA

Room:	Headset?	n
Jack:	Speaker?	n
Cable:	Mounting:	d
Floor:	Cord Length:	0
Building:	Set Color:	

ABBREVIATED DIALING

List1:	List2:	group	50	List3:	system
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HOT LINE DESTINATION

Abbreviated Dialing List Number (From above 1, 2 or 3):
Dial Code:

Line Appearance:	abrdg-appr	Ext:	3492
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Special Notes:

Once the Freeset extension is BRIDGED (abrdg-appr) to the person's WIRED phone, the Freeset extension number can no longer be dialed. Thus, when the user's WIRED extension is dialed, both the analog phone and the Freeset extension ring simultaneously. When the Freeset extension is dialed, the user gets a fast-busy signal.

The WIRED phone needs to be a secure location since someone may lift the handset while the user is on the Freeset and eavesdrop.