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INTEROPERABILITY REPORT

Ascom VoWiFi

**NEC IS3000/SIP @Net 51.00.0.0 (851.00.0) & Business ConneCT
6.0.0200**

IP-PBX Integration
Session Initiation Protocol (SIP)

Ascom, Gothenburg, SE

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INTRODUCTION

This interoperability report describes test results and optimal configuration of Ascom i62 towards NEC's IP-PBX.

The document should be used in conjunction with configuration guide(s) from NEC and Ascom.

Ascom

Ascom Wireless Solutions (<http://www.ascom.com/ws>) is a leading provider of on-site wireless communications for key segments such as hospitals, manufacturing industries, retail and hotels. More than 75,000 systems are installed at major companies all over the world. The company offers a broad range of voice and professional messaging solutions, creating value for customers by supporting and optimizing their Mission-Critical processes. The solutions are based on VoWiFi, IP-DECT, DECT, Nurse Call and paging technologies, smartly integrated into existing enterprise systems.

Founded in the 1950s and based in Göteborg, Sweden, Ascom Wireless Solutions is part of the Ascom Group and listed on the Swiss Stock Exchange. The company has subsidiaries in 10 countries and approximately 1,200 employees worldwide.

NEC

About NEC Corporation

NEC Corporation is a leader in the integration of IT and network technologies that benefit businesses and people around the world. By providing a combination of products and solutions that cross utilize the company's experience and global resources, NEC's advanced technologies meet the complex and ever-changing needs of its customers. NEC brings more than 100 years of expertise in technological innovation to empower people, businesses and society.

For more information, visit NEC at <http://www.nec.com>.

About NEC Unified Solutions

NEC Unified Solutions specialises in providing communications solutions to small, medium and large enterprises in both the private and public sectors. Designed for open connectivity, high availability and flexible growth, these solutions incorporate the latest voice, data and video technologies and enable real-time, collaborative working, increased productivity and significantly improved customer satisfaction. Serving customers through a network of direct sales organisations, business partners and value-added resellers, NEC Unified Solutions fosters a company-wide culture of customer dedication, flexibility and excellence throughout the EMEA (Europe, Middle East & Africa) region.

For more information, please visit: www.nec-unified.com.

SITE INFORMATION

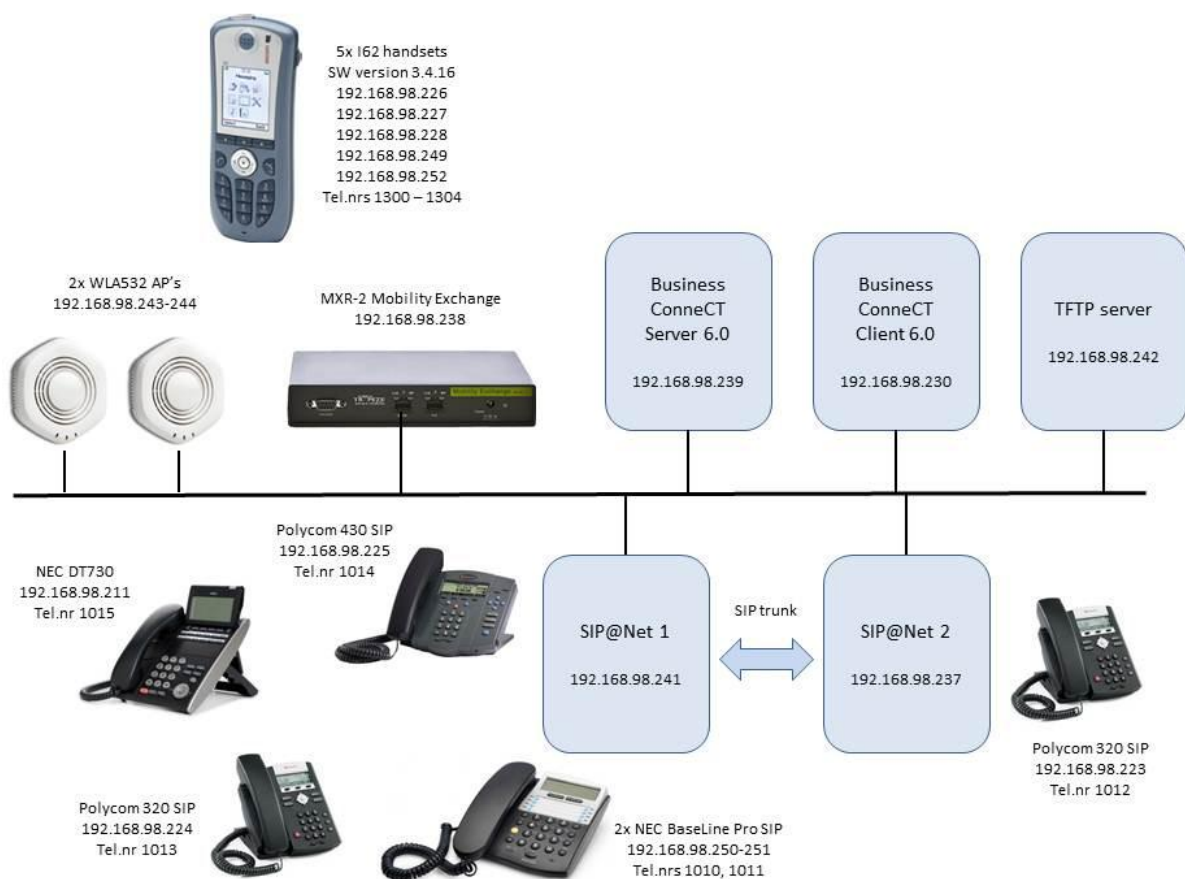
Test Site: NEC
 Hilversum
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Test Topology



SUMMARY

NEC IS3000/SIP@Net 51.00.0.0 (851.00.0) & Business ConneCT 6.0.0200

The outcomes of individual test cases in most areas were positive. However, it was agreed that the integration would not cover wall waiting (CW) due to unexpected behaviour in regard to some scenarios. It is also important to note that call park/pick-up was not tested at the time of validation.

Queries regarding licensing should be directed to the supplier of the IP-PBX solution.

Please see "Appendix A: Test Configurations" for further details.

WIFI

High Level Functionality	Result
Basic Call (UDP, no TLS)	OK
DTMF	OK
Hold, Retrieve, Enquiry and Brokering	OK
Attended Transfer	OK*
Unattended Transfer	OK*
Call Forward Unconditional	OK**
Call Forward No Reply	OK**
Call Forward Busy	OK**
Call Waiting	Not supported
Message Waiting Indication	OK
Call Park/Pick-up	Not Tested
Twinning (Concurrent call)	OK
Conference	OK***
Conference (ad-hoc)	OK
Do Not Disturb	OK
Calling Line/Name Identification	NOK*
Connected Line/Name Identification	NOK*

*) Transfer target (C) not updated with name of transferee (A), see "Known Issues"

**) Call diversions can either be supported by IP-PBX or locally in handset (previous preferred)

***) Requires conference bridge

Known Issues and Limitations

- MD5 authentication by name is not supported.
Workaround: One must authenticate using the number instead.
- Dual hold not supported by IP PBX (renders “500 Internal Server Error”).
- No indication at handset upon activation of IP-PBX-controlled call diversion (CDIV)
- Transfer target (C) is not updated with the name of transferee (A). This is resolved in NEC SIP@Net patch, version 51.00.0.0 (851.00.3). The fix will be included in official release SIP@Net Server 851.01.0.
- Name updates are not supported by the IP PBX over SIP trunks.
- Call waiting (CW) is not supported. It is therefore recommended to disable CW in the handset through WinPDM or remote management, i.e. Unite CM or IMS.
(Device > Call > Disable call waiting: Yes)

Note: The Ascom i62 must run hotfix version 3.4.16 to provide an acceptable level of integration towards this IP PBX.

For additional information regarding known issues, please contact interop@ascom.se.

General Conclusion

Ascom interoperability verification produced respectable results towards NEC IS3000/SIP@Net 51.00.0.0 (851.00.0) & Business ConneCT (BCT) 6.0.0200. Some exceptions concerned a number of test cases in which unexpected behaviour was observed, specifically in regard to call waiting (CW). That said, most test cases concerning basic call, brokering/enquiry, transfer, call diversion and message waiting indication passed with positive results.

Ascom i62 handsets were configured to register at the IP PBX using temporary three-day licenses. The “Hold Type” was left at its default setting (inactive), while DTMF signalling was transmitted through RTP (RFC2833/4733). In addition, handsets had “SIP Expires” set to 300 seconds and CW disabled. The codec of choice during testing was G.711A/20ms.

Please note that call park/pick-up was not tested at the time of validation. Furthermore call waiting is not covered in the certified solution.

BCT functionality was tested exclusively by NEC. Please see Appendix B for details.

TEST RESULTS

IP-PBX Integration - VoWIFI

Software Versions:

- NEC IS3000/SIP@Net, v. 51.00.0.0 (851.00.0)
- Business ConneCT, v. 6.0.0200
- Ascom i62, v. 3.4.16

Signaling Protocol:

- SIP (UDP)

NEC IS3000/SIP@Net & Business ConneCT:

- Appropriate caller line identities (CLI) require additional configuration on the IP PBX
- The IP-PBX must support “302 Moved Temporarily” SIP messages for local call diversion (CDIV) to work properly (enabled on IP-PBX)

Ascom i62:

- “Endpoint Number” and “SIP Proxy Password” correspond to number and password on IP-PBX
- Hold signaling: Inactive
- SIP Registration Expiration: 300s (recommended by NEC)
- Disable call waiting: Yes

Test Areas

Basic Call, DTMF: 94% pass (17/18)

- MD5 Authentication with number OK (name not supported, see “Known Issues”)
- DTMF OK
- Call rejected hangs up after 7 seconds due to signaling from IP PBX
- #5106.5 NOK
Cannot decline second incoming call when CW is enabled (CW not supported, see “Known Issues”)

Basic Call, Portable Unavailable: 100 % pass (6/6)

- Works as expected

Basic call, Stability: 100 % pass (2/2)

- Expected behavior

Procedure Mapping: 50 % pass (1/2)

- #5115.1 NOK
Feature codes do not work on second line

Three-party Services: 72% pass (18/25)

- #5117.1, 5117.2:
Dual hold not supported by IP PBX (renders “500 Internal Server” error)
- #5125.1, 5125.2, 5125.3, 5125.4, 5126.4:
Problems relating to CW (CW not supported, see “Known Issues”)

Call Diversion: 100 % pass (9/9)

- PBX-controlled and local CDIV OK
- 302 Moved Temporarily support must be enabled on IP PBX for local CDIV to work

Telephony Features: 100% pass (15/15)

- Tested telephony features OK
- MWI OK, however tested through simulation and not with actual Voice Mail
- Call park/pick-up not tested

BCT Features: 88% pass (14/16), carried out by NEC

- #5142.3:
Switched off status cannot be seen in BCT
- #5149.1:
Incoming calls can be answered by i62, not by BCT button (same as 3rd party DECT handsets)

Please keep in mind that metrics do not account for “no comments” or “untested” cases.

APPENDIX A: TEST CONFIGURATIONS

NEC IS3000/SIP@Net 51.00.0.0 (851.00.0) & Business ConneCT 6.0.0200

In the following appendix, you will find screenshots reflecting the management interface and aspects of configuring the IP-PBX application.

Basic configuration actions for extensions

The screenshot displays the NEC MA4000 Management System interface. At the top, the logo 'NEC MA4000 Management System' is visible on the left, and 'Administrator, System Settings | Logout' is on the right. Below the logo is a navigation menu with 'Administration', 'System', 'Users and Devices', 'Utilities', and 'Help'. A search bar labeled 'Help search ...' is located on the right side of the menu. The main content area is titled 'Edit Extension' and contains several buttons: 'Save', 'Cancel', 'Delete Extension', 'Refresh From IP-PBX', 'Reload Phone Configuration', and 'Return to Search'. On the left, a list of extensions is shown with columns for 'Number' and 'Name Display'. The extension '1300-95' with the name 'Alice' is selected. The main configuration area is titled 'EXTENSION DEFINITION' and is divided into 'Basics' and 'HARDWARE' sections. The 'Basics' section includes fields for 'Name Display' (Alice), 'Station Number' (1300-95), 'IP-PBX' (SIP@Net-1), and 'LEN (EHWA)' (15,2,0). The 'HARDWARE' section includes 'Model' (<None>), 'Connection Type' (SIP), 'Unit Number' (1), 'Board Number' (2), 'Circuit Number' (0), 'Cabinet Number' (1), 'Board Name' (Virtual SIP Extension), 'Signaling Group' (B001), 'Shelf Number' (5), 'Board Type' (39), and 'Peripheral Circuit Type' (Line Circuit (LCT)). A 'Location' field is also present at the bottom.

Number	Name Display
1010-95	
1011-95	
1012-95	
1013-95	
1014-95	
1015-95	
1300-95	Alice
1301-95	Bethany
1302-95	
1303-95	
1304-95	
1305-95	

Basics		
App / Dep	Name Display	
Call Forwarding	Alice	
ISDN	Station Number	
Service Class	1300-95	
Hotline	IP-PBX	LEN (EHWA)
Password Dialing	SIP@Net-1	15,2,0
SIP		
View All		

HARDWARE		
Model	Connection Type	
<None>	SIP	
Unit Number	Board Number	Circuit Number
1	2	0
Cabinet Number	Board Name	Signaling Group
1	Virtual SIP Extension	B001
Shelf Number	Board Type	Peripheral Circuit Type
5	39	Line Circuit (LCT)
Location		

Configure call forwarding relations

NEC MA4000 Management System

Administrator, System Settings | Logout

IP-PBX All

Administration System Users and Devices Utilities Help

Help search ...

Edit Extension

Save Cancel Delete Extension Refresh From IP-PBX Reload Phone Configuration Return to Search

Number	Name Display	Basics	CALL FORWARDING
1010-95		App / Dep	INTERNAL
1011-95		Call Forwarding	No Answer <input type="text"/> Busy <input type="text"/> Not Reachable <input type="text"/> Follow-Me <input type="text"/>
1012-95		ISDN	No Answer Timeout
1013-95		Service Class	<input checked="" type="radio"/> Default IP-PBX
1014-95		Hotline	<input type="radio"/> Custom individual Extension <input type="text"/> seconds
1015-95		Password Dialing	EXTERNAL
1300-95	Alice	SIP	No Answer <input type="text"/> Busy <input type="text"/> Not Reachable <input type="text"/> Follow-Me <input type="text"/>
1301-95	Bethany	View All	No Answer Timeout
1302-95			<input checked="" type="radio"/> Default IP-PBX
1303-95			<input type="radio"/> Custom individual Extension <input type="text"/> seconds
1304-95			OTHER
1305-95			Fixed Follow-Me <input type="text"/> Twinning <input type="text"/>

Configure group relations

NEC MA4000 Management System

Administrator, System Settings | Logout

IP-PBX All

Administration System Users and Devices Utilities Help

Help search ...

Edit Extension

Save Cancel Delete Extension Refresh From IP-PBX Reload Phone Configuration Return to Search

Number	Name Display	Basics	APPEARANCES
1010-95		App / Dep	Dependency Type To Number To Name Display Call Forward Type Call Forward Association Group Type Group Name Key Position Category Type
1011-95		Call Forwarding	
1012-95		ISDN	
1013-95		Service Class	DEPENDENCIES
1014-95		Hotline	Dependency Type From Number From Name Display Call Forward Type Call Forward Association Group Type Group Name Key Position Category Type
1015-95		Password Dialing	Group (Default) 1330 Group Member <u>Standard</u> 1330 Extension
1300-95	Alice	SIP	
1301-95	Bethany	View All	
1302-95			
1303-95			
1304-95			
1305-95			

Configure service classes and facility class marks

The screenshot shows the NEC MA4000 Management System web interface. At the top, there is a navigation bar with 'Administration', 'System', 'Users and Devices', 'Utilities', and 'Help'. A search bar is located on the right. Below the navigation bar, there is a 'Save' button and a 'Cancel' button. The main content area is titled 'Edit Extension' and contains a table of extensions. The extension 1300-95, named 'Alice', is selected. To the right of the table, there is a configuration panel for 'SERVICE CLASS'. This panel includes sections for 'ANALYSIS CLASS', 'TRAFFIC CLASS', 'CAMP ON BUSY', and 'CLI/DDI'. The 'ANALYSIS CLASS' section has 'Analysis Group Number' and 'Compatibility Value Number' both set to 0. The 'TRAFFIC CLASS' section has 'Day Traffic Class' and 'Night Traffic Class' both set to '3 (Local area)'. The 'CAMP ON BUSY' section has 'Camp on Busy Queue Length' set to 'Short'. The 'CLI/DDI' section has 'Local Domain' set to 1 and 'External Number' set to an empty field. A red warning message states: 'External Number Addressing preferences (in IP-PBX Configuration) not set for this IP-PBX.' Below the configuration panel, there is a 'Hide Facility Class Marks' button and a 'FACILITY CLASS MARKS' table with columns for 'Number', 'Name', and 'Status'.

Configure BCT application

The screenshot shows the NEC Business Connect application interface. The title bar indicates 'Business Connect - Free Trial, 69 Days Left - 1301 [Forwarded to: 1707]'. The user is identified as 'Eesje Lammetje Employee'. The interface is divided into several panels: 'Talk' (showing 'Connected to...' with a timer of 02:03 and 'For 1707'), 'Hold / Transfer', 'List of Voicemails' (showing two messages), 'Presence' (showing 'Out of the Office' status and a 'Ben er niet' button), and 'Directory' (showing a search bar and a table with columns for 'Name', 'Number', 'Calendar', and 'Mobi'). At the bottom, there are playback controls and a status indicator 'Play using: Phone PC audio'.

Please refer to NEC's documentation for further details about configuration and licensing.

Configuration:



SIP@NET
Configuration Info

Ascom i62

```
System => <A|B|C|D>
- Network Name: <name>
- DHCP Mode: ON
- 802.11 Protocol: 802.11a
- SSID: <SSID>
- Security Mode: WPA-PSK & WPA2-PSK
- WPA-PSK Passphrase: <***>
- Voice Power Save Mode: None
- 802.11 a/n Channels: UNII-1
- World Mode Regulatory Domain: World Mode (802.11d)
- Transmit Gratuitous ARP: Yes
```

```
Device => Settings
- User Display Text: <name>
- Language: <language>
- Language input: <language>
```

```
Device => General
- Time Zone: <time zone>
```

```
Device => Message Centre
- Message Centre number: <BCT Message Centre Number>
- Voice Mail number: <BCT Message Centre Number>
- Voice mail call clears MWI: No
```

```
Device => Call
- Disable call waiting: Yes
```

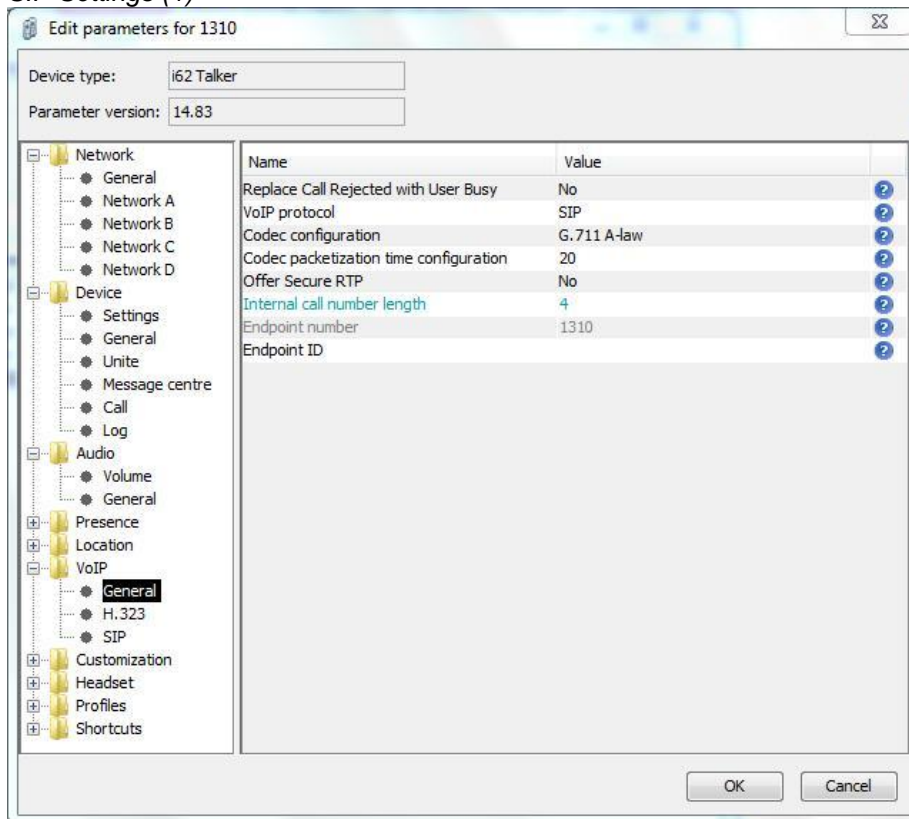
```
Audio => General
- Dialing Tones Pattern: <country>
```

```
VoIP => General
- VoIP Protocol: SIP
- Codec Configuration: G711A
- Codec Packetization Time Configuration: 20ms
- Internal Call Number length: 4
- Endpoint Number: <Endpoint>
- Endpoint ID: <NULL>
```

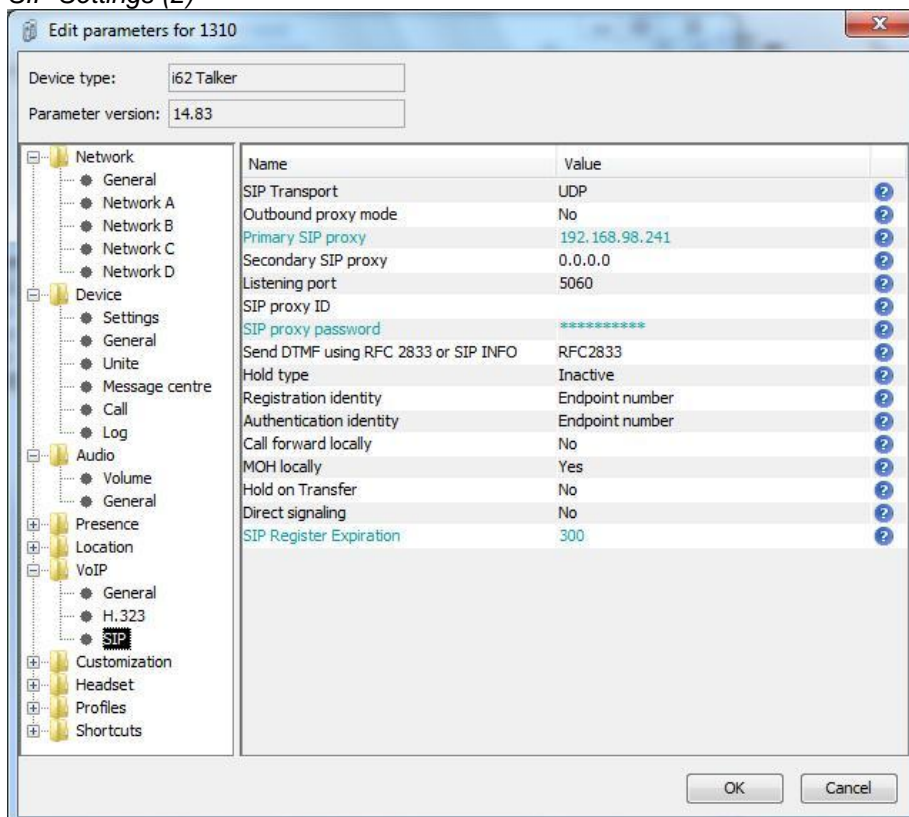
```
VoIP => SIP
- SIP Transport: UDP
- Primary SIP Proxy: <IP>
- SIP Proxy password: <user password>
- SIP Register Expiration: 300
```

Other settings were left at their defaults.

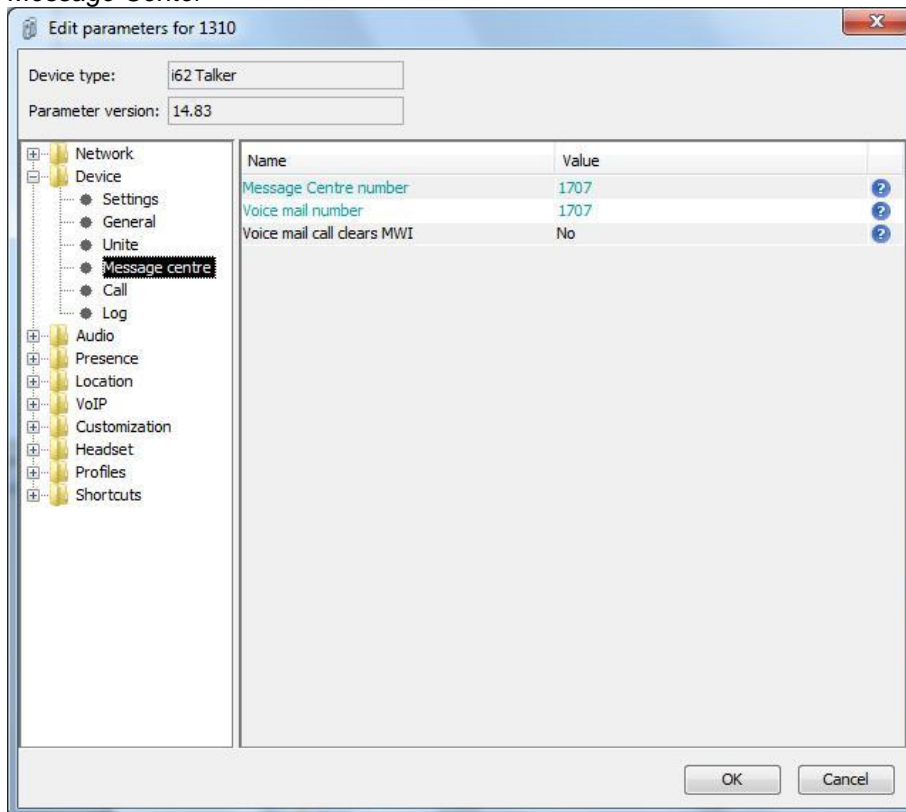
SIP Settings (1)



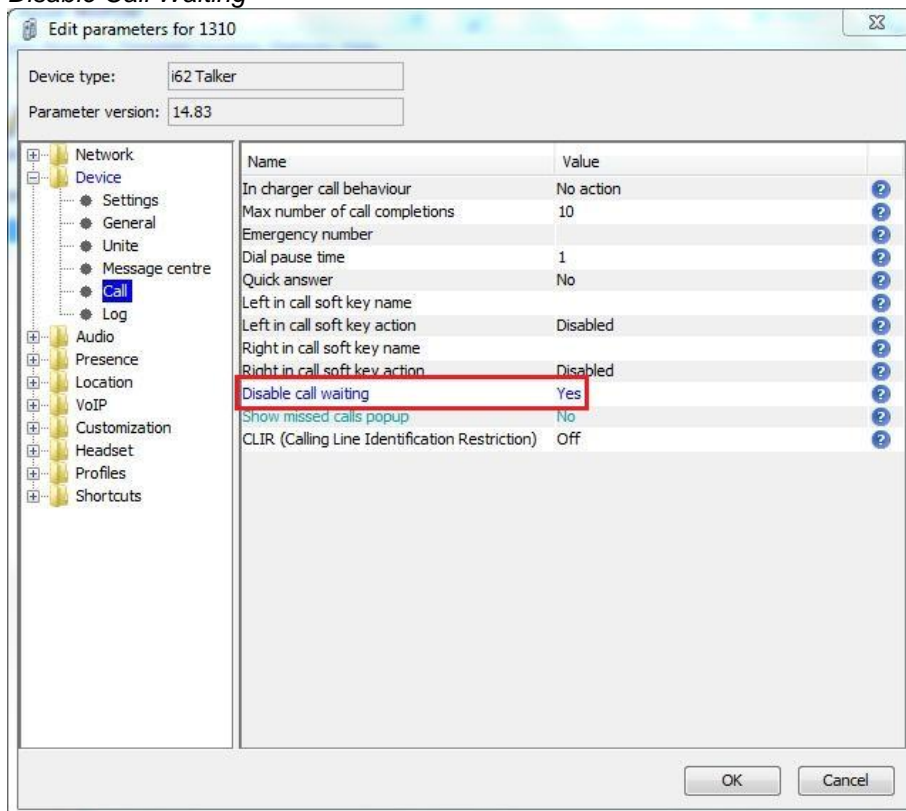
SIP Settings (2)



Message Center



Disable Call Waiting



Please note that WLAN infrastructure is not a part of this certification.

Template file:



Ascom i62 template

APPENDIX B: DETAILED TEST RECORDS

Ascom VoWIFI

Pass	82
Fail	11
Comments	25
Untested	3
Total	121



Ascom i62 Test
Results

Miscellaneous

Please refer to Ascom's "IP Telephony Services" test specification for detailed information regarding each test case. The document is available on the Ascom Extranet.

URL (requires login):

<https://www.ascom-ws.com/AscomPartnerWeb/en/startpage/Sales-tools/Interoperability>

Document History

Rev	Date	Author	Description
PA1	2012-09-20	SEMW	Initial draft
PA2	2012-10-22	SEMW, AnBI	Review and updates by NEC
PA3	2012-10-30	SEMW	Final draft
RevA	2012-10-30	SEMW	RevA