



Avaya IP-DECT Base Station and IP-DECT Gateway

Installation and Operation Manual

Software version 10.4.x

Issue 2
February 2020

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Contents

Introduction	13
Related documentation	13
Abbreviations and glossary	14
Description	15
IPBS1	15
IPBS1 with Internal Antenna	16
IPBS1 with External Antennas	18
IPBS2	18
IPBS2 with Internal Antenna	18
IPBS2 with External Antennas	22
IPBL	22
Overview	23
Power Supply	23
Software	23
LED indication	24
DECT Base Station (BS3x0)	25
DECT Base Station	26
DB1	27
DB1 with Internal Antenna	28
DB1 with External Antennas	30
AC-adapter	31
Safety Instructions	33
Protection Against Electrostatic Discharge (ESD)	33
ESD Handling	34
Safety Aspects	34
IP-DECT Base Station	34
DECT Base Station BS3x0 and TDM-DECT Base Station DB1	34
IP-DECT Gateway (IPBL)	34
Regulatory Compliance Statements (EU/EFTA only)	34
Regulatory Compliance Statements (USA and Canada only)	35
FCC compliance statements	35
Information to user	35
IC Requirements for Canada	36
Modifications	36
Exposure to radio frequency signals	36
IP Security	37
IP Security Terminology	37
TLS	37
Public Key Infrastructure	37
Cryptography	38
Introduction to IP Security in IP-DECT	38
Secure Web Access (https)	39
TLS Certificates	39
IP-DECT Administrative Functions	40

Configuration - HTTP	40
Configuration - Certificates	40
Configuration - SIPS.	40
Configuration - Secure RTP.	40
Installation of the Base Station.	41
Base Station Cabling	41
Install the Base Station	41
Fixing the Mounting Bracket to a wall	41
Fixing the Mounting Bracket to a ceiling	43
Fixing the Mounting Bracket to a pole or beam	43
Using the cable ducts for IPBS1	44
Connecting external antennas (only IPBS2 and DB1)	44
Securing the cable.	46
Pinning	47
Connecting the Base Station cables	49
Power the Base Station	50
Power the IPBS over Ethernet	50
Power the BS3x0 and DB1 over Express Powering Pair (EPP) and data pairs	51
Power the Base Station with a local power supply	51
Installation of the IPBL	53
Installing the IPBL	53
Pinning the IPBL cable	54
Synchronization cable	54
RFP cable	55
LAN cable	56
Power the IPBL.	56
110/230 VAC	56
Automatic Configuration	59
Using BroadWorks Device Manager	59
Manual Configuration.	61
Requirements	61
Web Browser Requirements	61
Access the GUI.	62
Determining the IP address.	62
Changing the default password	65
GUI web access	65
Login page	65
Access levels	65
Auditors	66
User administrators	66
System administrators	67
Managing the default system administrator account	68
Managing additional administrator accounts	69
Managing user administrators	70
Logout	71

Simplified GUI	71
Changing the interface to Advanced View	71
Changing the interface to Basic View	72
Configure the Mobility Master	72
Configure the Standby Mobility Master	73
Configure the Pari Master	73
Configure the Standby Pari Master	75
Configuring the Master	76
Configuring the Standby Master	77
Configuring the Slave/Radio	78
Configure deployment	79
Configuring Sync Master IPBS	79
Configuring Sync Slave IPBS	80
Add Users	80
Anonymous Registration	81
Individual Registration	82
User log in and log out	83
Log out	83
Log in	84
Operation	85
General	85
Name the IPBS/IPBL	86
Change User Name and Password	86
Display Login Text	86
Set Automatic Logout	86
Limit Sessions	86
Disable Native Authentication	87
Require User Certificate	87
Centralized Management of Admin/Auditor Accounts Using Kerberos	88
Set up the Kerberos server	88
Set up the client	89
Configure IPBS/IPBL as a client in a small existing system (few clients)	89
Join the realm	90
Configure IPBS/IPBL as a client in a large existing system (many clients)	91
Configure IPBS/IPBL as a client in a new system	91
Log in using Kerberos	92
Disable local authentication	92
Configure cross-realm authentication	93
Configuring the NTP settings	100
Certificates	101
Trust List	102
Provisioning	107
LAN	109
Setting the DHCP mode for IPv4	109
Setting a static IPv4 address	110
Setting dynamic IPv4 address using DHCP	110
Set DHCP Mode for IPv6	111

Dynamic IPv6 address via DHCP	111
Set an Automatic IPv6 Address	112
Set a Static IPv6 Address	112
Setting link type	113
Configuring VLAN	113
Setting 802.1.x	113
Viewing LAN statistics	114
Enabling RSTP (only for IPBL)	114
Deactivating LAN port (only for IPBL)	115
Disabling LLDP	115
IP4.	116
Configuring IP4 settings	116
Routing	116
TLS	117
IP6.	117
Routing	117
TLS	118
LDAP	118
Configure LDAP Server	119
Checking LDAP Server Status	119
Configure LDAP Replicator	120
Configure Full Directory Replication	120
Check LDAP Replicator Status	120
Expert tool	121
DECT	121
Changing System Name and Password	122
Setting Subscription Method	123
Configure Authentication Code	123
Select Tones	124
Set Default Language	124
Set Frequency Band	124
Enabling or disabling carriers	125
Enabling or disabling Local R-Key Handling	125
Enabling or disabling No Transfer on Hangup	125
Enabling or disabling No On-Hold Display	126
Enabling or disabling Display Original Called	126
Enabling or disabling early encryption	127
Wideband audio	127
Configure Coder	128
Secure RTP	129
Configure Supplementary Services	130
Select Master mode	131
Set Master Id	132
Enable PARI function	133
Configure Gatekeeper	133
Registration for Anonymous Devices	137
Select Crypto Master Mode	138
Select Mobility Master Mode	138
Connect Mobility Master to other Mobility Master(s)	139
Disconnect Mobility Master from other Mobility Master(s)	139

Connect Mobility Master to a Crypto Master	140
Connect Master to a Mobility Master	140
Entering admin password	141
Configuring Master ID	141
Configuring IP-PBX	141
Configure Trunks (applies only to H.323 protocol)	142
Enable or disable the radio	144
Enter IP Address to PARI Master and the Standby Master	145
Multiple Radio Configuration	145
Assign PARI	146
Enter SARI	146
Configure Air Synchronization	146
VoIP	149
Add instance id to the user registration with the IP-PBX	149
IP-PBX supports redirection of registration when registered to alternative proxy	149
Use local contact port as source port for TCP and TLS connections	150
Prefer P-Asserted-Identity As Calling Party Identity	150
Use SBC for NAT traversal	150
No Server Certificate Subject Check For TLS Connections	150
Accept Hold Signaling Using Remote Media Address 0.0.0.0	151
Remove SRTP Lifetime in SDP	151
Allow Multiple Codecs in Answer SDP	151
Configure Echo Celler	151
UNITE	152
Configure Messaging	152
Configure Network Regions	152
Device Management	153
Service Discovery	153
Send Status Log	154
Services	154
Configure Automatic Firmware Update	154
Configure Logging	155
Configure HTTP settings	156
Configure the HTTP Client settings	158
SNMP	158
Phonebook	159
Users	160
Show all Registered Users in the IP-DECT System	161
Search for User Information	161
Add a User	161
Add a User Administrator	162
Import Users from a csv or txt file	162
Export the Users to a txt file	163
Show all anonymous registered handsets	163
Add an anonymous handset	163
Import Anonymous Handsets from a csv or txt file	164
Export Anonymous Handsets to a txt file	164
Device Overview	165
Radios	165

Add Radios	165
Delete Radios	166
Move RFPs	166
RFPs	166
Sync Ring	169
Sync Ports	169
Air Sync	170
Sync Lost Counter in IPBS	170
Sync Lost Counter.	170
Impact for the Users.	171
DECT Sync	171
Air Sync Overview.	171
Disturbances.	173
Status.	173
Traffic.	174
Display All Ongoing Calls in the System	174
Display Calls	175
Handover.	175
Backup	175
Software Upgrade	176
Before Upgrading	176
Upgrading Sequence	176
Software Upgrade from 2.X.X.	177
Software Upgrade	177
Configuration After Updating the Firmware From Software Version 2.X.X to Later	178
Configuration After Updating the Firmware From Software Version 3.X.X to Later	179
System Upgrade from Software Version 4.X.X to 7.0.X	180
System Downgrade for IPBS2 and DB1	180
Update	180
Update Configuration	180
Update Firmware	181
Update the Boot File.	181
Update the RFPs.	182
System Upgrade in System with Mobility Masters	183
Replacing Master Hardware in Multiple Master System.	184
Replacing Master Hardware in a System with a Crypto Master Active.	184
Replacing Mobility Master Hardware in a System with a Crypto Master Active	184
Diagnostics.	185
Logging	185
Tracing	185
Alarms	186
Events	187
Performance	187
Config Show	189
Ping.	189
Traceroute	189
Environment	189
RFP Scan.	190

Service Report	190
Reset	190
Idle Reset.	190
Immediate Reset.	190
TFTP Mode	191
Boot	191
Reset Using the Reset Button	191
Commissioning	193
Radio coverage verification tests.	193
Base Station Operation Test	193
Coverage Area Test	193
Evaluation	194
Cordless Extension Number Test	194
Troubleshooting.	195
Updating with new firmware using the Gwload tool.	195
Fault Code Descriptions.	195
Appendix A - How to Configure and Use the Update Server	203
Appendix B - Local R-Key Handling	213
Appendix C - Update Script for Configuration of Kerberos Clients	215
Appendix D - Import Server Certificate in the web Browser	217
Appendix E - Import Client Certificate in the Web Browser	223
Appendix F - Used IP Ports	227
Appendix G - Configure DHCP Options	229

Introduction

This document describes how to install and operate the following equipment:

- IPBS ¹
- IPBL ²

The document is intended as a guide for the System administrators:

For information on the IP-DECT system, see the System Description documentation for IP-DECT.

For information about supported PBXs contact your supplier.

Related documentation

Avaya IP-DECT Installation and Administration Manual.

1. In previous documentation, *IPBS Base Station* (or *IPBS*) was sometimes referred to as *IP-DECT Base Station*.
2. In previous documentation, *IPBL* was sometimes referred to as *IP-DECT Gateway*.

Abbreviations and glossary

Base Station	Common name for IPBS, DECT Base Station (BS3x0) and TDM-DECT Base Station.
DECT	Digital Enhanced Cordless Telecommunications: global standard for cordless telecommunication.
DECT Base Station	Another name for <i>BS3x0</i>
TDM-DECT Base Station	Another name for DB1.
Device	A device can be an IPBS or IPBL.
DHCP	Dynamic Host Configuration Protocol
DTMF	Dual Tone Multiple-Frequency
FER	Frame Error Rate
GUI	Graphical User Interface
IP	Internet Protocol: global standard that defines how to send data from one computer to another through the Internet
IPBL	Previously called <i>IP-DECT Gateway</i> or, more commonly, as "the Blade"
IPBS	Also referred to as <i>IPBS Base Station</i> . Previously called <i>IP-DECT Base Station</i>
LAN	Local Area Network: a group of computers and associated devices that share a common communication line.
LDAP	Lightweight Directory Access Protocol
PBX	Private Branch Exchange: telephone system within an enterprise that switches calls between local lines and allows all users to share a certain number of external lines.
PSCN	Primary receiver Scan Carrier Number: defines the RF carrier on which one receiver will be listening on the next frame.
RFP	Radio Fixed Part. DECT base Station part of the DECT Infrastructure.
RFPI	Radio Fixed Part Identity
RSSI	Radio Signal Strength Information
RSTP	Rapid Spanning Tree Protocol
RTP	Real-Time Transport Protocol
SST	Site Survey Tool
ToS	Type of Service
VLAN	Virtual Local Area Network

Document History

Issue	Date	Summary of changes
Avaya IP-DECT R 4.7.1, Issue 1	19 September 2019	First issue of this release.
Avaya IP-DECT R 4.7.1 Issue 2	6 February 2020	Updated Secure RTP on page 129.

Description

This section gives a general description of the following devices:

- IPBS1, see [IPBS1](#) on page 15
- IPBS2, see [IPBS2](#) on page 18
- IPBL, see [IPBL](#) on page 22
- DECT Base Station, see [DECT Base Station \(BS3x0\)](#) on page 25.
- TDM-DECT Base Station, see [DB1](#) on page 27

IPBS1

The following versions of the IPBS1 are available:

- IPBS1 with internal antenna
- IPBS1 with external antennas

IPBS1 with Internal Antenna

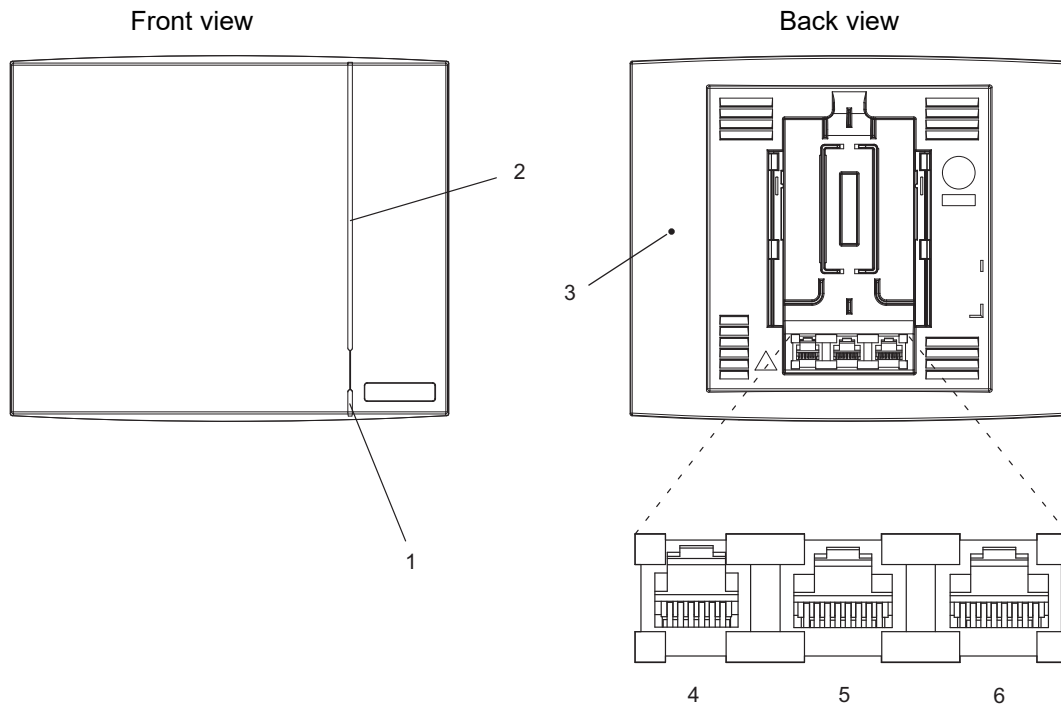


Figure 1. IPBS1 Overview

Contents of the box

The box in which the IPBS1 is packed contains:

- An IPBS1 with integrated antennas
- A patch cable (approx. 1 m)
- A mounting bracket
- Two screws with wall plugs

Power distribution

The IPBS1 can be powered using the following methods:

- Power over Ethernet, IEEE 802.3af
- A local AC-adapter

Note:

For more information about power distribution, see [Power the Base Station](#) on page 50.

Software

The software in the IPBS1 can be updated by downloading new software without disconnecting the equipment. The new software is stored in flash memory. See [System Downgrade for IPBS2 and DB1](#) on page 180 for information.

Connectors

- Two 8-pin RJ45 modular jacks for LAN/PoE and powering
- A 6-pin RJ12 modular jack for factory testing

LEDs

Status of LED1 (lower LED)	Description
Steady Green	Operational
Flashing fast amber	Download of firmware in progress.
Steady Amber	TFTP mode
Alternating red/green	No Ethernet connection

Status of LED2 (upper LED)	Description
Not lit	IPBS1 operational and no traffic on the IPBS1. Air synchronization OK.
Steady green	IPBS1 operational and traffic on the IPBS1. Air synchronization OK.
Slow flashing green	Fully occupied with traffic. Air synchronization OK.
Flashing amber	Air synchronization inadequate and no traffic.
Slow flashing amber	Air synchronization inadequate and fully occupied with traffic.
Steady amber	Air synchronization inadequate and traffic.
Flashing red	No air synchronization - searching for air sync candidates.
Quick flashing red	Download of RFP software in progress.

Note:

All amber statuses are warnings that Air synchronization, although still adequate, is fading and might be lost. A flashing red indicates lost Air synchronization.

IPBS1 with External Antennas

The IPBS1 is available with two omni-directional external antennas. Other external antennas can be mounted as well. This section contains the differences between the IPBS1 with internal and external antennas. For all other information see [IPBS1 with Internal Antenna](#) on page 16.

Contents of the Box

- The box in which the IPBS1 is packed contains:
- An IPBS1 for external antennas
- Two antennas
- A mounting bracket
- Two screws with wall plugs

Note:

The IPBS1 cannot be mounted with the antennas pointing downwards as the mounting bracket does not support it.

Insert the antennas into the IPBS1 before following the installation instructions in [Install the Base Station](#) on page 41.

IPBS2

The following versions of the IPBS2 are available:

- IPBS2 with internal antenna
- IPBS2 with internal antenna for IP Office
- IPBS2 with external antennas

The IPBS2 is backward compatible with the IPBS1 when it comes to coverage, functionality, accessories and mounting bracket. If an old IPBS1 has to be replaced you just reuse the mounting bracket and install the IPBS2.

IPBS2 with Internal Antenna

This description also applies to the IPBS2 with internal antenna for IP Office. The following versions are available:

- IPBS2-C3A/1A,
- IPBS2-C4A/1A e
- IPBS2-Z3A/1A

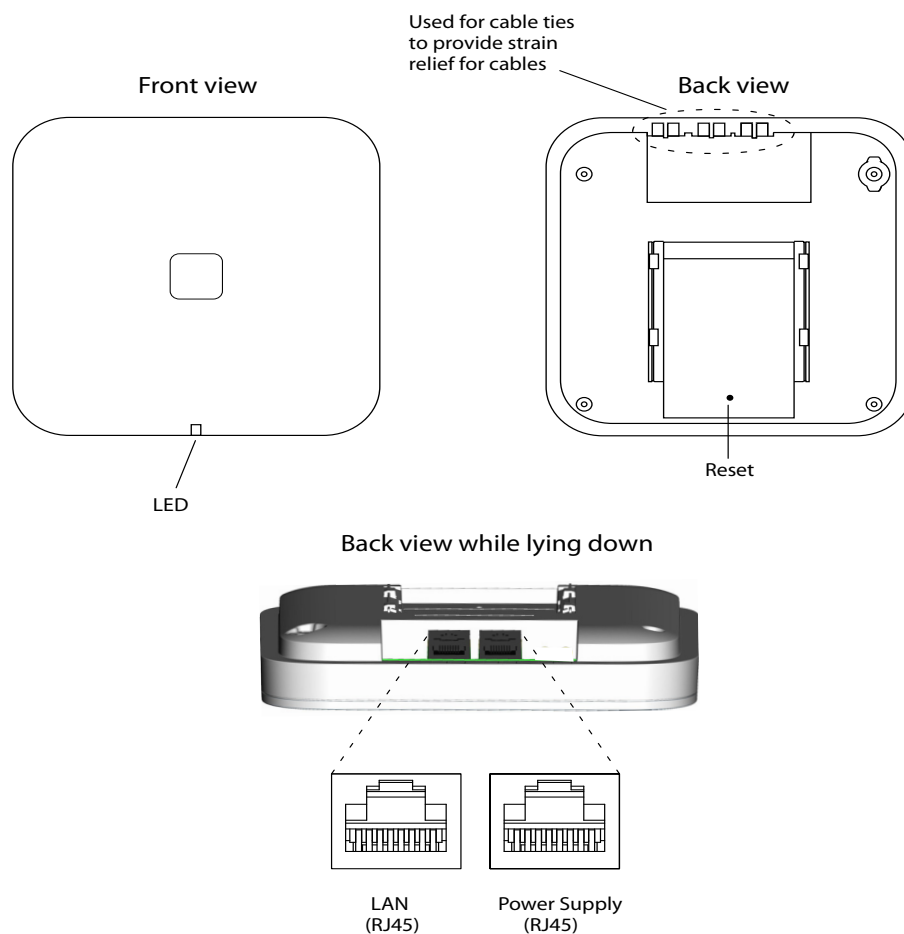


Figure 2. IPBS2 Overview

Contents of the box

The box in which the IPBS2 is packed contains:

- An IPBS2 with integrated antennas
- A mounting bracket
- Two screws with wall plugs

Power distribution

The IPBS2 can be powered using the following methods:

- Power over Ethernet, IEEE 802.3af

Note: Brazil is a POE only solution.

Note: For more information about power distribution, see [Power the Base Station](#) on page 50.

Software





The software in the IPBS2 can be updated by downloading new software without disconnecting the equipment. The new software is stored in flash memory. See [System Downgrade for IPBS2 and DB1](#) on page 180 for information.

Connectors

- Two 8-pin RJ45 modular jacks for LAN/PoE and powering

LEDs

The IPBS2 has one RGB LED to indicate status. This section describes the different indications and when they shall be used. In the illustrations below: Each blink pattern is represented by a number of blocks where each block is 100 ms. Light grey blocks means that the LED is off. Whenever the indication is changed the new pattern always starts from the first block.

<i>Idle/OK</i>	Solid blue.		IPBS2 operational and no traffic on the IPBS2.
<i>Starting up/ searching</i>	100 ms blue, 100 ms off.		The IPBS2 is in start-up phase, e.g. waiting for parameters from Master, or is searching for air synchronization.
<i>Active traffic</i>	400 ms off, 2000 ms blue.		IPBS2 operational and traffic on the IPBS2.
<i>Fully occupied for speech traffic</i>	400 ms red, 2000 ms blue.		Fully occupied with traffic.

Software download 400 ms blue, 600 ms off.

Download of firmware in progress.



Mini firmware 100 ms yellow, 100 ms off.

The IPBS2 is in mini firmware mode.



TFTP mode Solid yellow.

TFTP mode.



Error 100 ms red, 100 ms off.

No Ethernet connection.



Fatal error Solid red.

Fatal hardware error.



Deployment: Good sync 2000 ms blue, 400 ms yellow.

The IPBS2 is in deployment mode and has good air sync coverage.



Deployment: Bad sync 400 ms blue, 600 ms off, 400 ms blue, 600 ms off, 400 ms yellow.

The IPBS2 is in deployment mode and does not have adequate air sync coverage.



Deployment:
No sync

2000 ms red, 400 ms yellow.

The IPBS2 is in deployment mode and has no air sync coverage.



IPBS2 with External Antennas

This section contains the differences between the IPBS2 with internal antenna and the IPBS2 with external antennas. For all other information see [IPBS2 with Internal Antenna](#) on page 18.

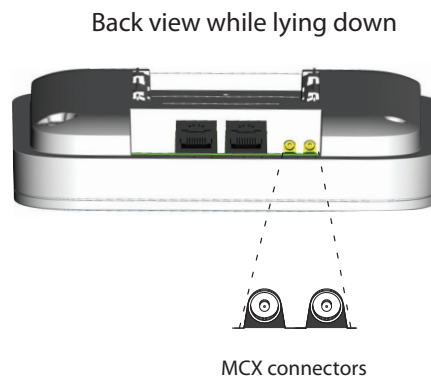


Figure 3. IPBS2 with MCX connectors for external antennas.

Contents of the box

The box in which the IPBS2 is packed contains:

- An IPBS2 with external antennas.
- A mounting bracket
- An antenna bracket
- Two antenna coaxial cables.
- Two antennas.
- Four screws with wall plugs

IPBL

The following version of the IPBL is available:

- IPBL IP-DECT Gateway 110/230 VAC

Overview

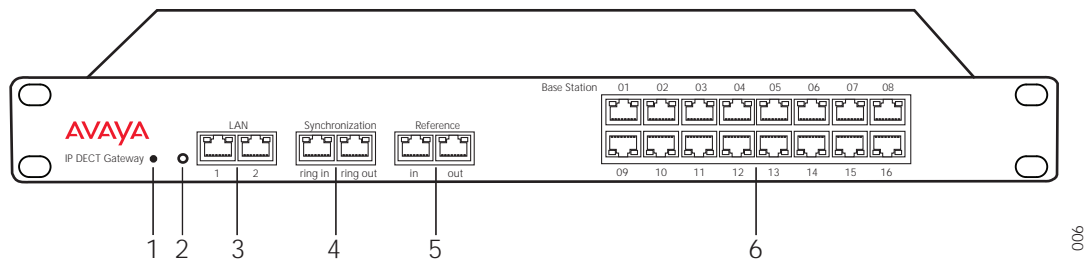


Figure 4. Overview of the IPBL

Pos.	Name	Function
1	Reset	Resets the IPBL, see Reset Using the Reset Button on page 191 for more information.
2	Status LED	Indicates the status on the IPBL.
3	Lan	10BASE-T/100BASE-T Ethernet interface. LAN1 port must be used in the IP-DECT system (LAN2 port is for administration only).
4	Synchronization	Sync ring in and sync ring out interfaces.
5	Reference	Reference sync in and reference sync out interfaces.
6	Base station 01-16	ISDN U _{PN} DECT base station interfaces.

Power Supply

The power supply are located at the rear of the IPBL. The IPBL can be powered using the following alternatives:

Note:

110/230 VAC (*only IPBL IP-DECT Gateway VAC/VDC*)

Note:


For more information, see [Power the IPBL](#) on page 56.


Software


The software in the IPBL can be updated by downloading new software without disconnecting the equipment. The new software is stored in flash memory. See [System Downgrade for IPBS2 and DB1](#) on page 180 for information.


LED indication


Status LED	Description
Not lit	Not powered, status is not defined.
Flashing slow green	When pressing the reset button.
Flashing fast green	Firmware update or clear config after long reset.
Steady green	Status OK, system is fully operational.
Steady red	Status Fail, system error condition.
Steady amber	System is in TFTP server mode.


Base station LED 	Description
Not lit	No U _{PN} link established.
Flashing	U _{PN} link established (activated state), RFP is not operational.
Steady	RFP is fully initialised and operational.

Base station LED 	Description
Not lit	No speech activity in RFP.
Flashing	All speech channels occupied in RFP.
Steady	Speech activity in RFP.

Sync/Ref sync LED 	Description
Not lit	No sync communication established.
Steady	Communication established.

Sync/Ref sync LED 	Description
Not lit	Sync port not selected as input sync source.
Flashing	Sync port selected as input sync source but the sync signal is not in sync.
Steady	Sync port selected as input sync source and the sync signal is in sync.

Lan LED 	Description
Not lit	No link.
Flashing	Link present and network activity.
Steady	Link present, but no network activity.

Lan LED 	Description
Not lit	10 Mbps operation.
Steady	100 Mbps operation.

DECT Base Station (BS3x0)

The following versions are available:

- BS330-9131 (EU) with Internal antenna
- BS330-9134 (US) with Internal antennas
- BS340-9131 with External antenna

DECT Base Station

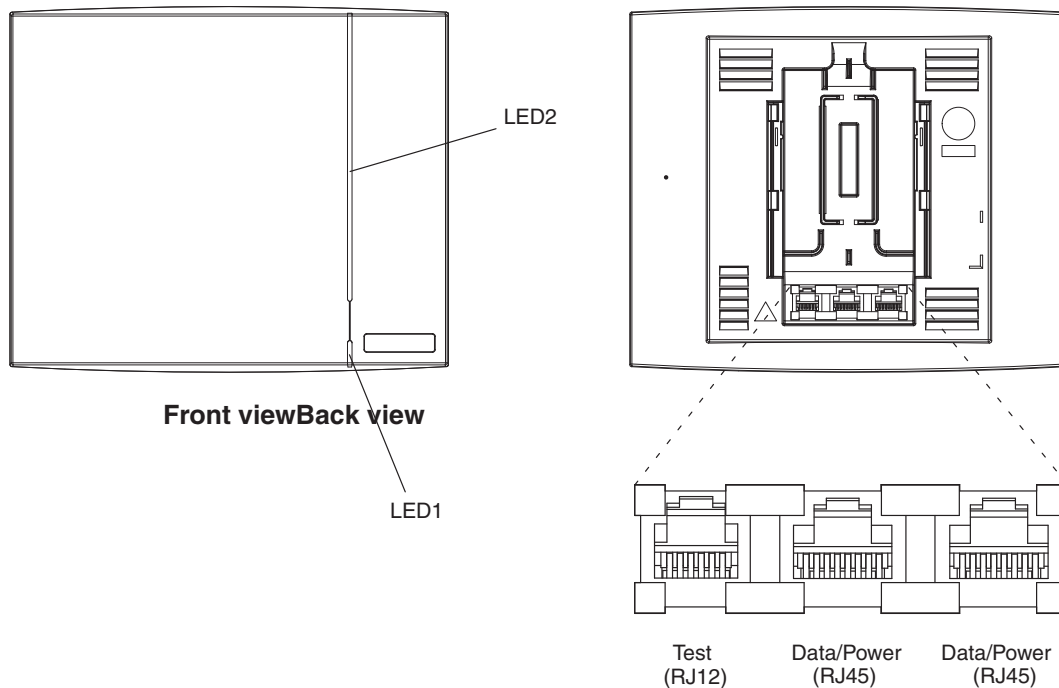


Figure 5. BS3x0 Overview

Contents of the box

The box in which the base station is packed contains:

- A base station
- Two antennas (only base station with external antenna)
- A mounting bracket
- Two screws with wall plugs

Power distribution

The base station can be powered using the following methods:

- From the IPBL via the Express Powering Pair (EPP) and data pairs
- With a local AC-adapter

Note:

For more information about power distribution, see [Power the Base Station](#) on page 50.

Software

The software in the BS3x0 can be updated by downloading new software without disconnecting the equipment. The new software is stored in flash memory. See [System Downgrade for IPBS2 and DB1](#) on page 180 for information.

Connectors

- Two 8-pin RJ45 modular jacks for data and powering
- A 6-pin RJ12 modular jack for factory testing

LEDs

Status of LED1 (lower LED)	Description
Steady Green	Power LED

Status of LED2 (upper LED)	Description
Not lit	Base station operational and no traffic on the base station.
Flashing green	Fully occupied with traffic.
Steady green	Base station operational and traffic on the base station.
Flashing amber	Software is being downloaded to the base station
Steady amber	Base station is OK, but not available (self-test, not initialized, no communication with IPBL)

DB1

The following versions of the DB1 are available:

- DB1 with internal antenna
- DB1 with external antennas

The DB1 is backward compatible with the BS3x0 when it comes to coverage, functionality, accessories and mounting bracket. If an old BS3x0 has to be replaced you just reuse the mounting bracket and install the DB1.

DB1 with Internal Antenna

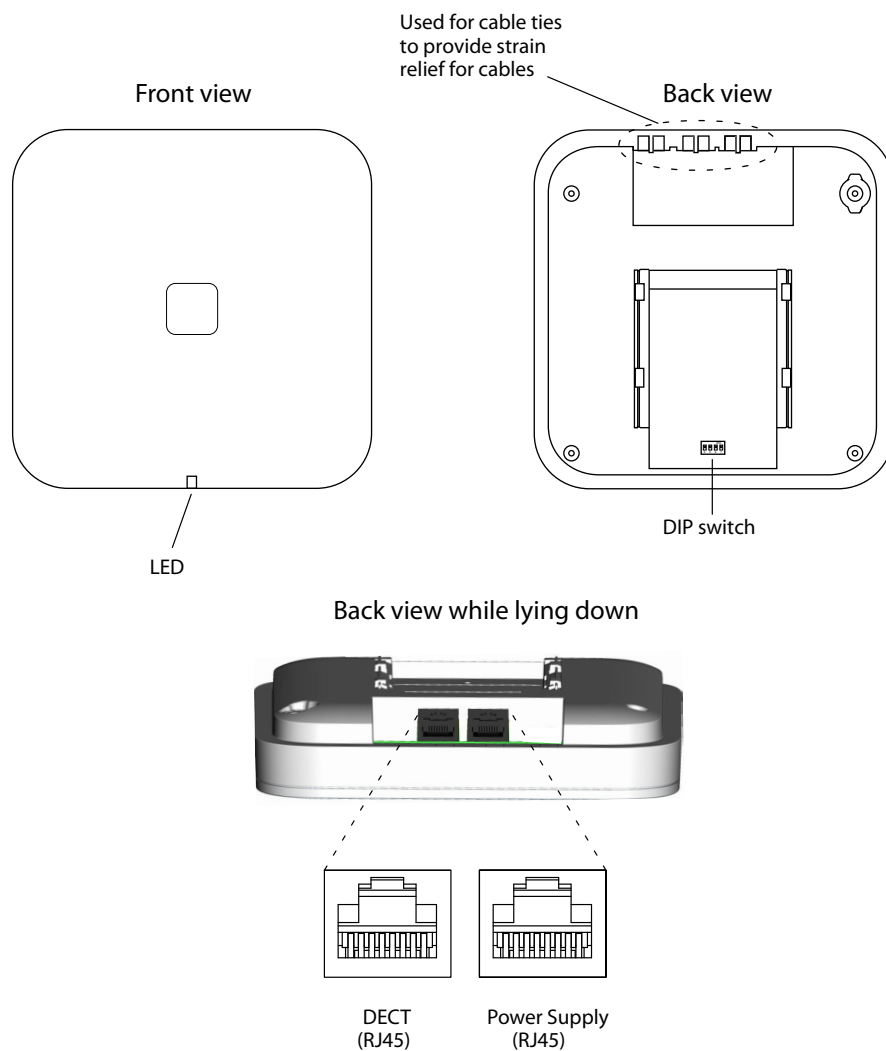


Figure 6. DB1 Overview

Contents of the box

The box in which the DB1 is packed contains:

- A DB1 with integrated antennas
- A mounting bracket
- Two screws with wall plugs

Power distribution

The DB1 can be powered using the following methods:

- From the IPBL via the Express Powering Pair (EPP) and data pairs
- With a local AC-adapter

Note:

For more information about power distribution, see [Power the Base Station](#) on page 50.

Software

The software in the DB1 can be updated by downloading new software without disconnecting the equipment. The new software is stored in flash memory. See [System Downgrade for IPBS2 and DB1](#) on page 180 for information.

Connectors

- Two 8-pin RJ45 modular jacks for data and powering

LEDs

The IPBS2 has one RGB LED to indicate status. This section describes the different indications and when they shall be used. In the illustrations below: Each blink pattern is represented by a number of blocks where each block is 100 ms. Light gray blocks means that the LED is off. Whenever the indication is changed the new pattern always starts from the first block.

Idle/OK

Solid blue.



DB1 operational and no traffic on the DB1.

Starting up

100 ms blue, 100 ms off.



The DB1 is in start-up phase, i.e. waiting to be initialized by the IPBL.

Active traffic

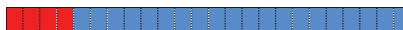
400 ms off, 2000 ms blue.



DB1 operational and traffic on the DB1.

Fully occupied for speech traffic

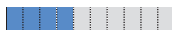
400 ms red, 2000 ms blue.





Fully occupied with traffic.

Software download

400 ms blue, 600 ms off.



Download of firmware in progress.

Error	100 ms red, 100 ms off. 	U _{PN} layer 1 communication error.
Fatal error	Solid red. 	Fatal hardware error.

DIP Switches

The DIP switches can be found on the back of the DB1, see [figure 6](#) on page 28.

Note: DIP switch 2, 3 and 4 shall be set to ON.

Set DIP switch 1 to ON or OFF as follows:

DIP switch 1: ON	IPBL mode, when the DB1 is to be connected to an IPBL.
DIP switch 1: OFF	Integral mode, when the DB1 is to be connected to an I5/I55 system.

DB1 with External Antennas

This section contains the differences between the DB1 with internal antenna and the DB1 with external antennas. For all other information see [DB1 with Internal Antenna](#) on page 28.

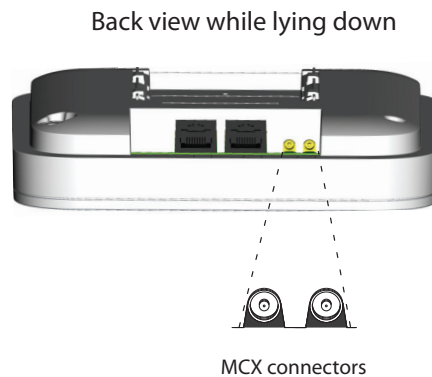


Figure 7. DB1 with MCX connectors for external antennas.

Contents of the box

The box in which the DB1 is packed contains:

- A DB1 with external antennas.
- A mounting bracket

- An antenna bracket
- Two antenna coaxial cables.
- Two antennas.
- Four screws with wall plugs

AC-adapter

The AC-adapter is used to power a base station locally.

Note:

The maximum length of cable from adapter must not exceed 10 meters.

Versions (different type of mains plug)

For European countries except U.K.	Art. no.: 130137B	Order. no.: BSX-0013
For U.K.	Art. no.: 130136B	Order. no.: BSX-0014
For NA	Art. no.: 130138A	Order. no.: BSX-0015
For Australia	Art. no.: 130139B	Order. no.: 660261



Important:

If local power supply is used for the RFPs, the EPP cable pair must NOT be connected.

Safety Instructions

For safe and efficient operation, observe the guidelines given in this manual and all necessary safety precautions. Follow the operating instructions and adhere to all warnings and safety precautions located on the product and this manual.

- Installation and service is to be performed by service persons only.
- IPBL must be connected to a mains socket outlet with a protective earthing connection.
- IPBL must be mounted in a Restricted Area Location (RAL) in Sweden, Finland and Norway.
- Ensure that the voltage and frequency of the mains power socket matches the voltage and frequency inscribed on the equipment's electrical rating label.
- Never install telephone wiring during a thunderstorm.

Note:

Avoid touching or punching down the IPBS/RFP signal and power pairs as there is 48Vdc or 24Vdc present on these wires at all times.

- Always install the base station conforming to relevant national installation rules.
- Disconnect all power sources before servicing the equipment.
- Use only approved spare parts and accessories. The operation of non-approved parts cannot be guaranteed and may cause damage or danger.
- Only approved power supplies according to valid editions of EN/IEC/CSA/UL/AU/NZS 60950 are to be used when the IPBS/RFPs are powered by local power supplies.

Protection Against Electrostatic Discharge (ESD)

Integrated circuits are sensitive to ESD. To avoid damage caused by ESD, service engineers and other people must handle equipment and boards carefully.

Electronic equipment has become more resistive to ESD, but we see an increase of situations where static electricity can build up. This is caused by an increasing application of man-made fibres like nylon, acrylic, etc. which are capable of generating ESD of 10,000 Volts and more.

Walking across a nylon carpet, even for a few feet, could cause a person to be charged-up to more than 10,000 Volts.

Under these conditions, if a system board or a (C)MOS device is touched it could easily be damaged. Although the device may not be totally defective, it is often degraded, causing it to fail at a later date without apparent reason.

To make sure that equipment and parts are well protected during shipment, special packaging materials are utilized. System boards will be shipped in anti-static bags and (C)MOS devices and other sensitive parts in small shielded boxes.

ESD Handling

In the interest of quality and reliability, it is advisable to observe the following rules when handling system parts:

- Keep parts in their protective packaging until they are needed.
- When returning system parts like EEPROMS to the factory, use the protective packaging as described.
- Never underestimate the damaging power ESD can have and be especially careful when temperatures are below freezing point and during very warm weather in combination with low humidity. Make sure that the environmental conditions remain within the limits specified in the components' data sheets.



Important:

In the interest of quality and reliability system boards and other parts returned for exchange or credit may be refused if the proper protective packaging is omitted!

Safety Aspects

IP-DECT Base Station

The IP-DECT Base Station meets the valid editions of safety standard EN/IEC/CSA/UL/AU/NZS 60950-1. The system is a class III equipment for stationary wall mounting.

DECT Base Station BS3x0 and TDM-DECT Base Station DB1

The DECT Base Station BS3x0 and TDM-DECT Base Station DB1 meets the valid editions of safety standard EN/IEC/CSA/UL/AU/NZS 60950-1. The system is a class III equipment for stationary wall mounting.

IP-DECT Gateway (IPBL)


The IPBL meets the valid editions of safety standard EN/IEC/CSA/UL/AU/NZS 60950-1.

Regulatory Compliance Statements (EU/EFTA only)

The equipment are intended to be used in the whole EU&EFTA.

The equipment are in compliance with the essential requirements and other relevant provisions of R&TTE Directive 1999/5/EC. The Declarations of Conformity may be consulted at:

<http://support.avaya.com/DoC>

The IP-DECT Base Stations, BS3x0 Base Station, TDM-DECT Base Station DB1 and IP-DECT Gateway are marked with the label .

Regulatory Compliance Statements (USA and Canada only)

FCC compliance statements

The equipment have been tested and found to comply with the limits for a Class B digital device (Base Stations), pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/tv technician for help.

Information to user

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- this device may not cause interference, and
- this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et

2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC Requirements for Canada

This Class B digital apparatus (Base Stations) complies with Canadian ICES-003.

Cet appareil numérique (stations de base) de la Classe B conforme à la norme NMB-003 du Canada.

This Class A digital apparatus (IP-DECT Gateway) complies with Canadian ICES-003.

Cet appareil numérique (IP-DECT Gateway) de la Classe A conforme à la norme NMB-003 du Canada.

Modifications

Any modifications not expressly approved by Avaya could void the user's authority to operate the equipment.

Exposure to radio frequency signals

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

IP Security

IP Security Terminology

TLS

Note:

Secure Socket Layer (SSL) has been replaced with Transport Layer Security (TLS). While TLS 1.0 is based on SSL 3.0/3.1, TLS 1.1 and 1.2 are updates from their previous versions. This document hereafter uses the term TLS.

TLS is a security mechanism based on cryptography (see [Cryptography](#) on page 38) and is used for encrypting communications between users and TLS-based websites. The encryption prevents eavesdropping and tampering with any transmitted data.

TLS operates on the OSI Model Level 5 and uses PKI (see [Public Key Infrastructure](#) on page 37).

Mutual TLS refers to the process when both the user and the website authenticate each other through verifying the provided digital certificates.

Note:

IPBS and IPBL version 10.0.x supports TLS versions 1.0, 1.1, and 1.2.

Public Key Infrastructure

Public Key Infrastructure (PKI) is a component of Public Key Cryptography (PKC) that uses:

- Public Key Certificates, see [Public Key Certificates \(Digital Certificates\)](#) on page 37
- Certificate Authorities, see [Certificate Authorities](#) on page 38

Public Key Certificates (Digital Certificates)

Public Key Certificates are used for key exchange and authentication. They are simply electronic documents (files) that incorporate a digital *signature* to bind together a *public key* with an *identity* (information such as the name or a person or organization, their address, and so forth).

The signature may be signed by a trusted entity called a Certificate Authority (CA), see [Certificate Authorities](#) on page 38.

The most common use of public key certificates is for TLS certificates (https websites).

Certificate Authorities

A Certificate Authority or Certification Authority (CA) is a trusted entity which issues public key certificates. The certificates contain a public key and the identity of the owner. The CA asserts that the public key belongs to the owner, so that users and relying parties can trust the information in the certificate.

Certificate Signing Request (CSR) or Certification Request

CSR is a message that is generated and sent to a CA in order to apply for a TLS certificate. Before the CSR is created a key pair is generated, the private key kept secret. The CSR will contain the corresponding public key and information identifying the applicant (such as distinguished name). The private key is not part of the CSR but is used to digitally sign the entire request. Other credentials may accompany the CSR.

If the request is successful, the CA will send back an identity certificate that has been digitally signed with the CA's private key.

A CSR is valid for the server where the certificate will be installed.

Cryptography

Cryptography is the encoding of messages to render them unreadable by anyone other than their intended recipient(s). Modern cryptography uses complex algorithms implemented on modern computer systems.

Cryptography tasks can be divided into the two general categories Encryption and Authentication.

Encryption

Encryption is the scrambling of information so that the original message cannot be determined by unauthorized recipients by applying an *encryption algorithm* to the message *plaintext* producing *ciphertext* (apparently random bits). A *decryption algorithm*, if given the correct key, converts the ciphertext back into plaintext. Public key algorithms use paired keys, one for encryption and another for decryption.

Authentication

Authentication is the verification of a message's sender. This requires the message to be protected so it cannot be altered, usually by generating a *digital signature* formed by a hash of the message. Only the correct key can generate a valid signature.

Introduction to IP Security in IP-DECT

A secure system requires more planning than an unsecured system.

Secure Web Access (https)

For IP-DECT devices

- https access should be enabled
- http access should preferably be disabled

For more information see [Configure HTTP settings](#) on page 156 .

TLS Certificates

Security in Web-based applications rely on cryptography. Cryptographic systems are only as secure as their *keys*. This makes *Key Management* a critical and often neglected concern. *TLS Certificates* have emerged as a clever way of managing large scale key distribution.

Two certificate management tasks are needed for TLS:

1. Trust relationships when the device must know which third parties (e.g. IP-PBX) it shall trust in, see *Trust Relationships*.
2. Device certificates to authenticate the device against third parties, see [Certificate Handling Options with Device Certificates](#) on page 39.

Trust Relationships

Trust relationships are defined by a trust list in the device. The list contains the certificates to be accepted by the device for TLS secured connections (for example HTTPS, SIPS).

For more information see [Trust List](#) on page 102.

Certificate Handling Options with Device Certificates

There are three certificate handling options:

- Default Device certificate
- The default certificate is supplied with the device. It is a self-signed certificate. Self-signed certificates provide only encryption, not authentication.

For more information see [Default Device Certificate](#) on page 104.

- Self-signed certificates
- This option is for customers not planning on having their certificates signed by public or private CAs. Self-signed certificates provide encryption but do in most cases not provide authentication.

For more information see [Self-signed Certificates](#) on page 104.

- Certificates signed by a Certificate Authority (CA).

Two options are possible:

- **A)** Certificates signed by the customer's own CA. Customers possessing the knowledge and infrastructure to house their own CA could build an internal enterprise

CA, enabling them to sign (approve) their own certificate requests. This would make the customer a private CA.

- **B)** Certificates signed by a trusted public third party entity/organization. There are only about a dozen issuers who have the authority to sign certificates for servers worldwide. An example is VeriSign. To use a public CA for certificate approvals the IP-DECT system would in most cases need to be connected to the Internet and hold a fully qualified domain name. For more information see [Certificate Signing Request \(CSR\)](#) on page 105 and [Import of Certificate Including Private Key \(PKCS #12 file\)](#) on page 106.

IP-DECT Administrative Functions

Configuration - HTTP

The HTTP tab is used to configure the type of web access that should be allowed for the device, includes a field for configuring https access.

For more information see [Configure HTTP settings](#) on page 156.

Configuration - Certificates

The *Certificates* tab lists the certificate used by web browsers to authenticate the identity of the device (Web server).

For more information see [Certificates](#) on page 101.

Configuration - SIPS

SIP Secure (SIPS) is used to encrypt the signaling communication between the IPBS and the IP-PBX. SIPS uses the TLS protocol for encryption. The signaling between the IPBSs is also encrypted by default and there is no possibility to disable it.

For more information see [Configure Gatekeeper](#) on page 133.

Configuration - Secure RTP

Secure RTP (SRTP) is used to encrypt the voice communication between the end user equipments.

For more information see [Secure RTP](#) on page 129.

Installation of the Base Station

This section describes how to install the IPBS, BS3x0 and DB1. All three base stations can be fixed to a wall, a ceiling, a pole or a beam, by means of the mounting bracket included. When fixing the base station to a wall or ceiling the included plugs and screws must be used. When fixing it to a pole or beam a strap or a flexible metal band must be used, this is not included.

Note:

Fixing the base station to metal surfaces requires special consideration and is not recommended for several reasons. If this is unavoidable try to ensure a distance between the base station and the metal surface of, preferably, 1 meter.

Base Station Cabling

Recommended base station cable is a standard CAT5 unshielded Ethernet cable with minimum 26 AWG copper conductors, this cable is also used for powering the base station. It is assumed that installation personnel know how to crimp RJ45 connectors to a cable.

Note:

Since the distance between the base station and the wall is limited, a RJ45 modular jack without cable retention must be used.

Note:

Ensure that during the installation of an base station, each base station is given an extra length (5-10 meters) of cable because it is possible that it will have to be moved for one reason or another.

Install the Base Station

The base station can be mounted vertically or horizontally. Mount the base station at places and positions as determined in the base station plan, see the applicable System Planning documentation for IP-DECT. The base station must be placed in a way that it is not facing large metal objects such as large heating pipes.

Fixing the Mounting Bracket to a wall

Fix the mounting bracket (see [figure 8](#) on page 42) to the wall as follows:

1. Hold the mounting bracket with its flat side against the wall with the text 'TOP' upwards and mark the two holes. The minimum distance between the upper hole and the ceiling or any object above the base station must be at least 65 mm for IPBS1 and 100 mm for IPBS2 and DB1, see [figure 8](#) on page 42. If the distance is less than 65/100 mm, the base station cannot be slid onto the bracket.
2. When using wall plugs: Drill the two holes using a \varnothing 6 mm drill and insert the included wall plugs.
3. Position the mounting bracket with its flat side to the wall and fasten it with the two included \varnothing 3.5 mm screws.

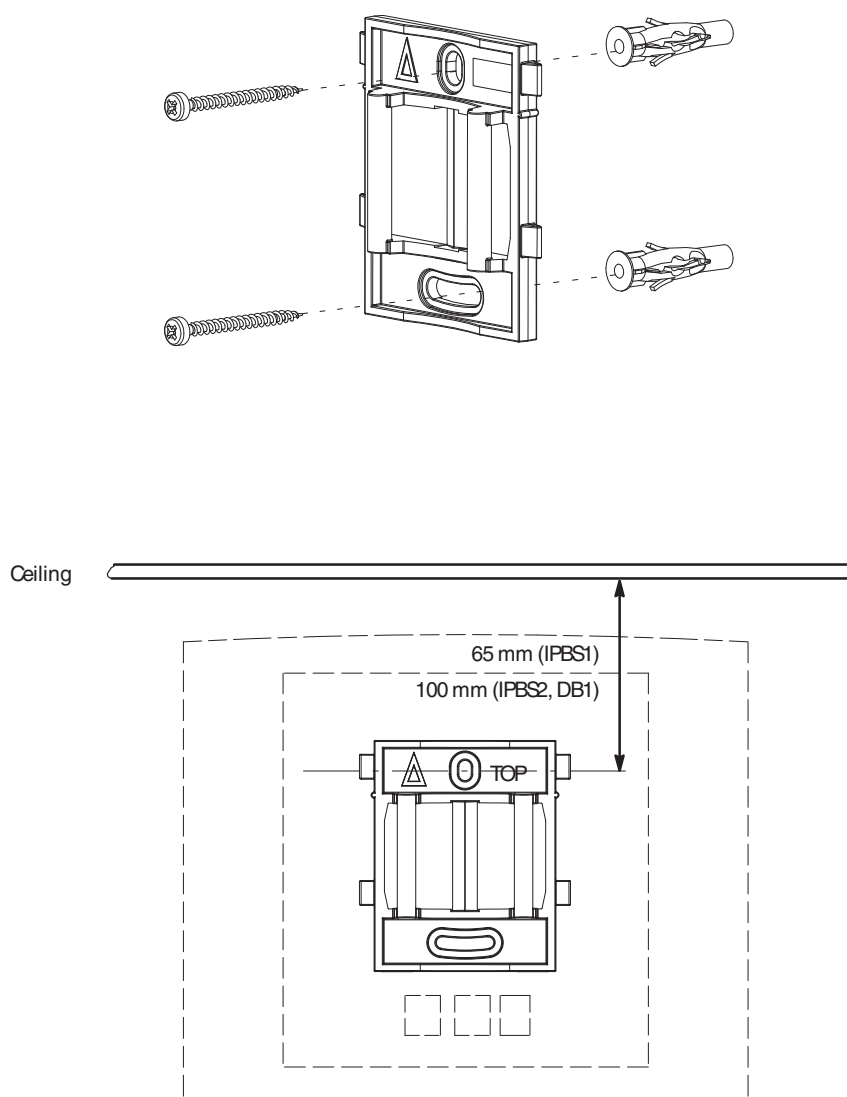


Figure 8. Fixing the mounting bracket to a wall.

Fixing the Mounting Bracket to a ceiling

Fixing to a ceiling is done in the same way as the a wall, see *Fixing the Mounting Bracket to a wall*. When the base station has to be positioned above a suspended ceiling, make sure that the front of the base station points downwards.

Fixing the Mounting Bracket to a pole or beam

The mounting bracket can be fixed to a pole (diameter ≥ 45 mm) or a beam (wider than 50 mm) by means of a strap or flexible metal band less than 30 mm wide. The strap or flexible metal band is not included in the box.

1. Fix the mounting bracket to a pole or beam using the metal band, see [figure 7](#) on page 43.

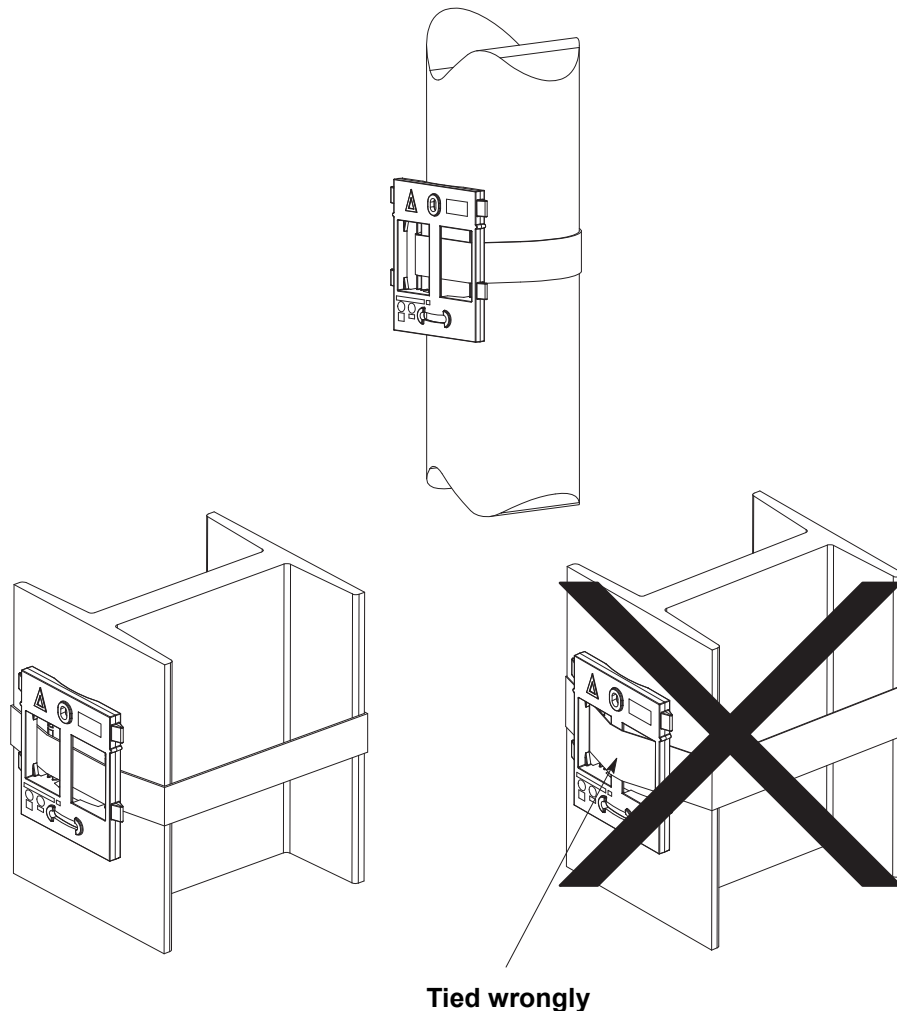
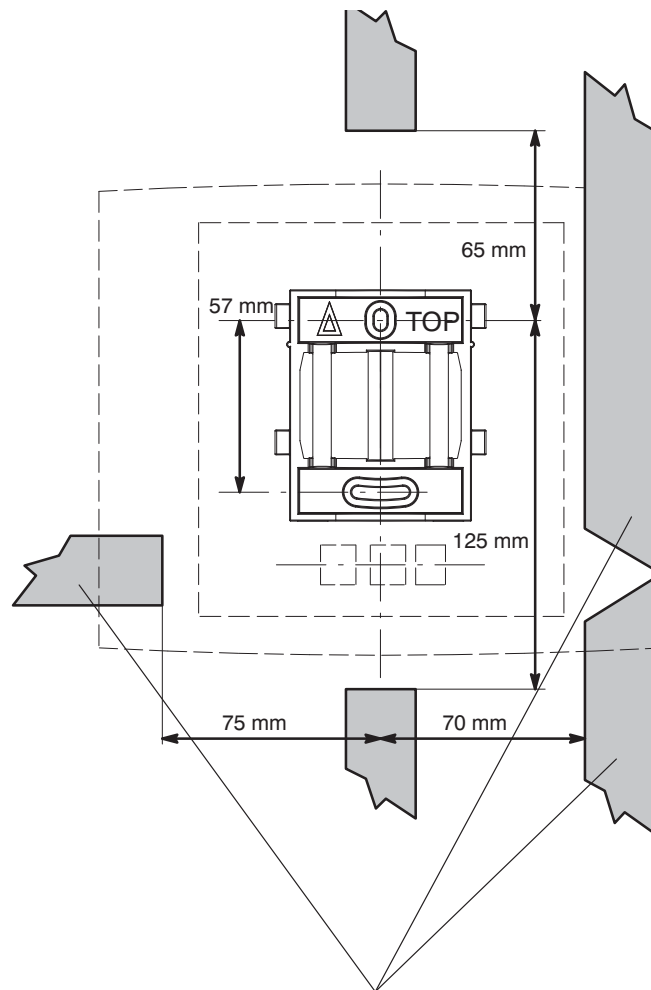


Figure 9. Fixing the mounting bracket to a pole or beam.

Using the cable ducts for IPBS1

When the base station IPBS1 is mounted to the wall, cable ducts can be used to route the wiring through.

1. Fix the cable duct to the wall in one of the positions shown in [figure 8](#) on page 44.



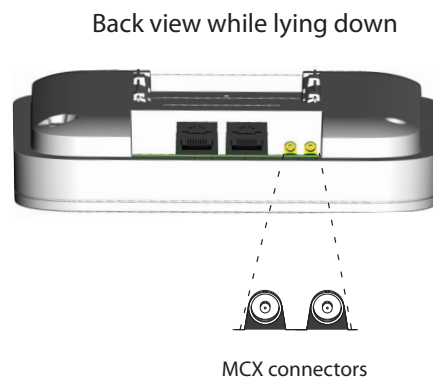
15 mm thick cable ducts

Figure 10. Minimum distances between a cable duct and the mounting bracket

Connecting external antennas (only IPBS2 and DB1)

1. Position the included antenna bracket above the mounting bracket with a minimum distance of 74 mm (250 mm maximum) and mark the two holes for the antenna bracket, see [figure 11](#) on page 46 (1).

2. When using wall plugs: Drill the two holes using a \varnothing 6 mm drill and insert the included wall plugs.
3. Position the antenna bracket to the wall and fasten it with the two included \varnothing 3.5 mm screws.
4. Mount the two included coaxial cables on the antenna bracket [figure 11](#) on page 46 (2). Fasten the coaxial cables with the lock nuts which are found on the coaxial cable antenna connectors.
5. Mount the antennas on the antenna connectors (2).
6. Connect the coaxial cables to the MCX connectors on the base station.



7. Mount the base station (3), see [4. Mount the Base Station](#) on page 50.

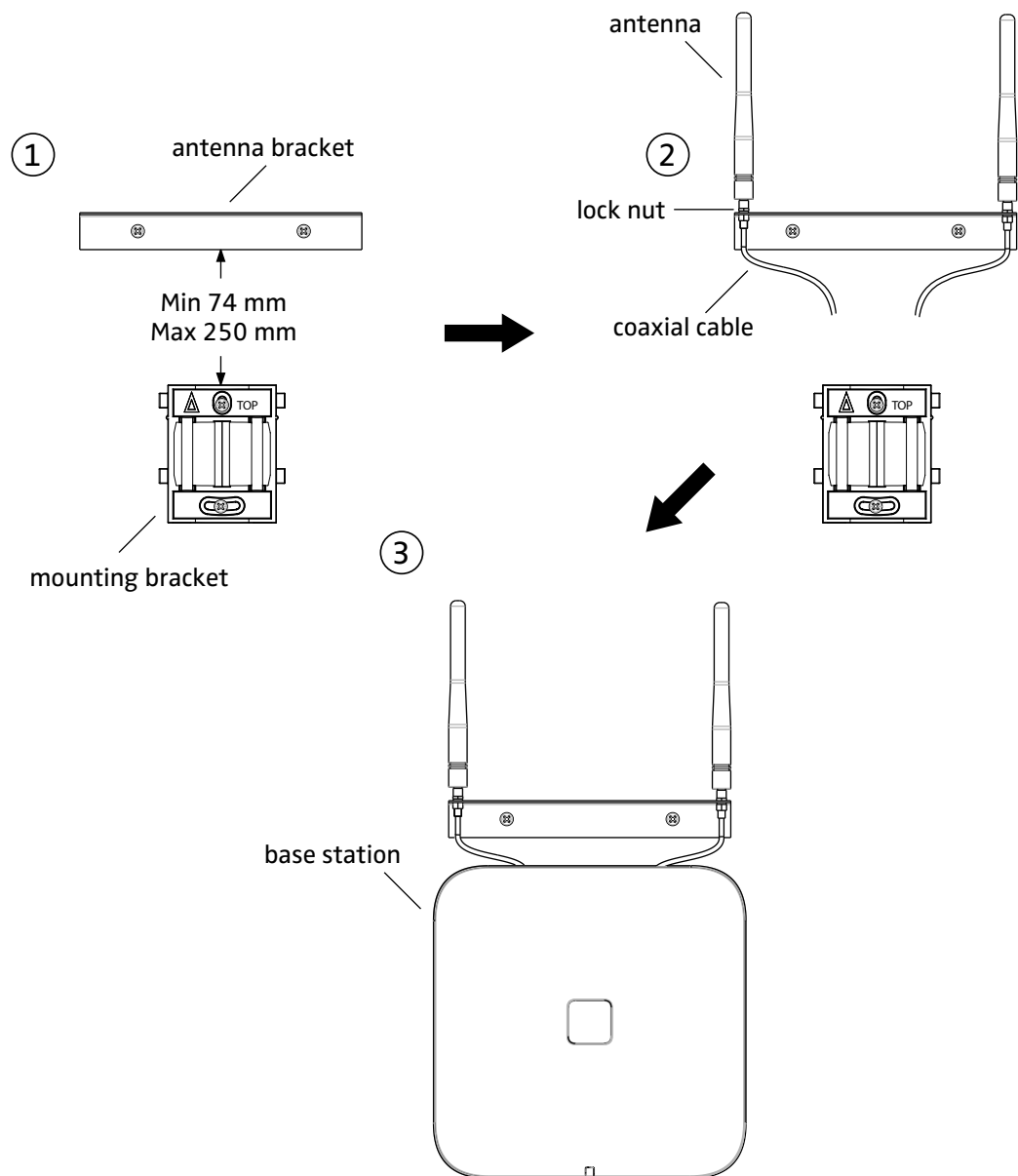


Figure 11. Connect external antennas.

Securing the cable

For safety reasons secure the base station cable to a convenient point at about 30 cm from the base station.

If for some reason the base station drops, it is secured by the cable.

Pinning

1. Cut the cable to the correct length and connect the cable to a RJ45 modular jack.
2. For information on the pinning of the data jack see the following:
 - IPBS, [Pinning the IPBS cable](#) on page 48.
 - BS3x0 and DB1, [Pinning the BS3x0/DB1 cable](#) on page 49.

**Tip:**

Do **not** plug the connector in the base station yet.

Note:

Since the distance between the base station and the wall is limited, a RJ45 modular jack without cable retention must be used.

Pinning the IPBS cable

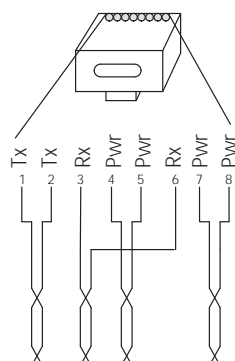


Figure 12. Connector pinning of the LAN/PoE connector, power feed over the spare cable pairs.

RJ45 modular jack

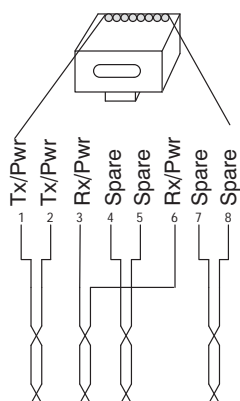
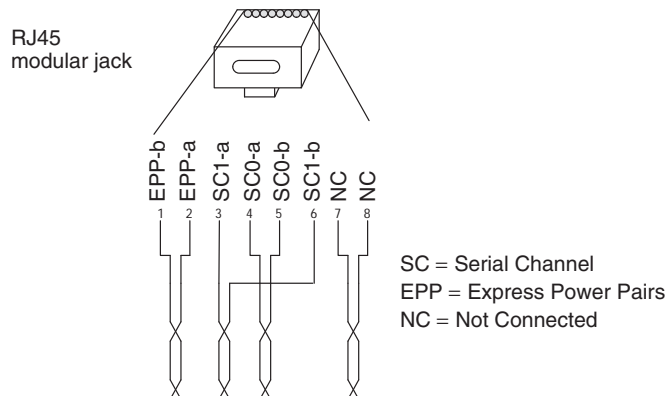


Figure 13. Connector pinning of the LAN/PoE connector, power feed over the Rx/Tx data cable pairs.

Pinning the BS3x0/DB1 cable

Figure 11.



008

Figure 14. Connector pinning of the Data connector

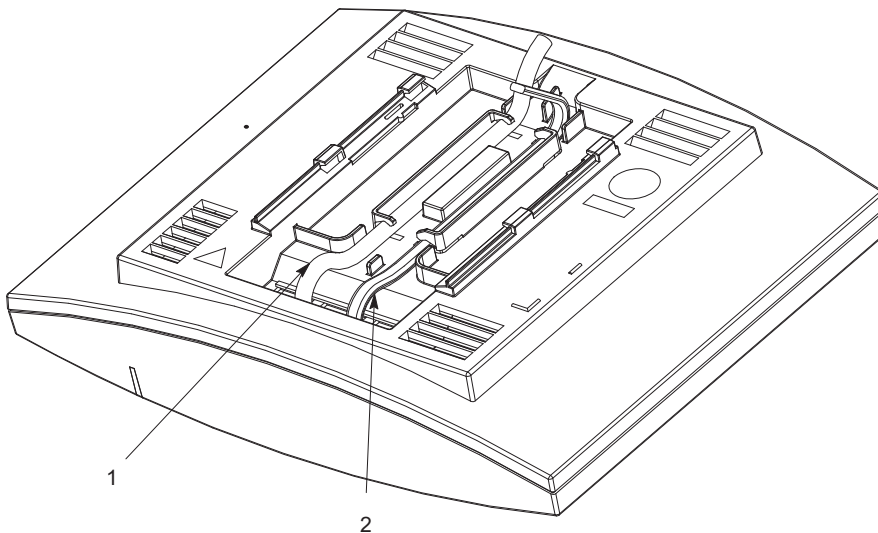


Important:

If local power supply is used, the EPP cable pair must NOT be connected.

Connecting the Base Station cables

1. Only for IPBS1: If it is required that the cables enter the base station centrally from above, guide the cables through the recess in the middle of the base station as shown below.



2. Plug the modular jack of the data cable into one of the data/power connectors.
3. When an AC-adaptor is used:
 - Plug the modular jack of the AC-adaptor in one of the data/power connectors.

- Plug the AC-adapter into a wall-outlet.

4. Mount the Base Station

Hold the base station flat against the mounting bracket and move it downwards until it clicks, see below.

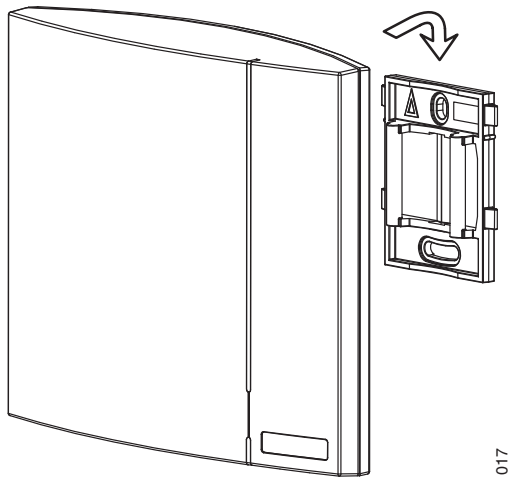


Figure 15. Mounting of the IPBS.

Power the Base Station

The base station is powered the following ways:

- Power over Ethernet (only IPBS).
- Power over Express Powering Pairs (EPP) and data pairs (only BS3x0 and DB1)
- By a local power supply.

Note:

Do not power the base station using both power supplies. Parallel powering will not harm the base station but it can disturb the signaling.

Power the IPBS over Ethernet

The IPBS supports Power over Ethernet, IEEE 802.3af, class 2. The power source will allocate 7W to the IPBS. This must be regarded when planning the powering of the IPBSs so that the power limit of the PoE power source is not exceeded.

The PoE standard supports two ways of feeding the power:

- Power over the Rx/Tx data pairs.
- Power over the spare cable pairs.

Both power feed methods are supported in the IPBS, it is also insensitive to change of the polarity.

Power the BS3x0 and DB1 over Express Powering Pair (EPP) and data pairs

When a base station is powered remotely via the IPBL, the maximum length between the base station and the IPBL depends on the supply voltage, the number of twisted pairs used and the wire size. The length of the cable should never exceed "data-limited" length of the cable, see [Appendix C: Update Script for Configuration of Kerberos Clients](#) on page 215.

Power the Base Station with a local power supply

Powering the base station with a local power supply can be done using the second data/power inlet on the base station. The base station can be powered individually by an AC-adapter. The AC-adapter is provided with an 8-pin RJ45 plug that can be plugged into the *Power Supply* jack. For specification see [AC-adapter](#) on page 31.

Note:

Only approved power supply according to valid editions of EN/IEC/CSA/UL/AU/NZS 60950 is to be used when the base station is powered by a local power supply.

Installation of the IPBL

This section describes how to install the IPBL.

Installing the IPBL

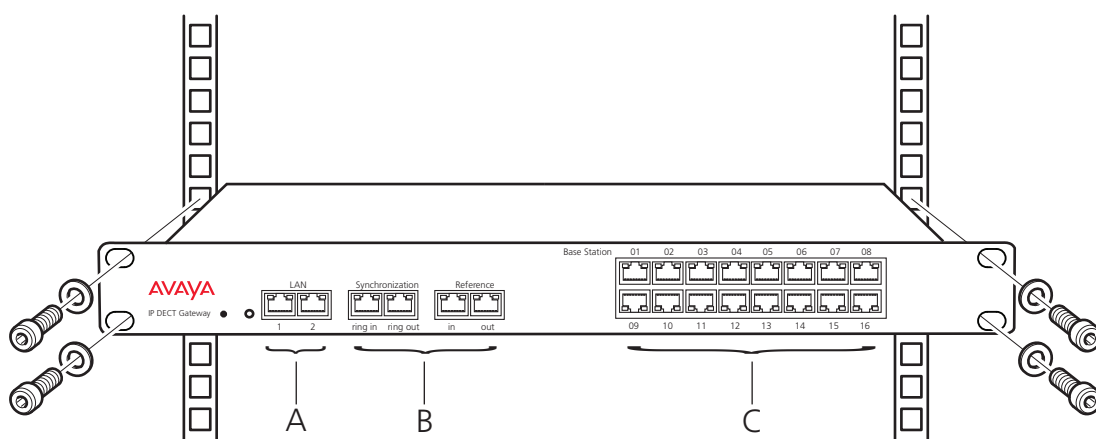


Figure 16. Install the IPBL

The main steps of the installation is described below:

1. Install the IPBL in a standard 19" rack.
2. Pin the cables, see [Pinning the IPBL cable](#) on page 54.
3. Attach the power cable, see [Power the IPBL](#) on page 56.
4. Connect the cables in the following order:
 - Ethernet cable (A) LAN1 port must be used in the IP-DECT system (LAN2 port is for administration only).
 - Synchronization cable (ring sync, reference sync) (B)
 - Base station cable (RFP cable) (C)



Important:

The connected RFPs must not be connected to protective earth.

- Monitor the total current consumption from the GUI. See [Environment](#) on page 189. Make sure it not exceeds the following values:
 - Max current consumption is 1,9/0,9 A when supplied with 110/230 VAC.

Note:

The IPBL current consumption is 0,3 A and is included in max current consumption.

For more information of power consumption of the RFPs, see [Appendix C: Update Script for Configuration of Kerberos Clients](#) on page 215.

Pinning the IPBL cable

All data cables used for the IPBL is standard CAT5 unshielded cable. It is assumed that installation personnel know how to crimp these connectors to a cable.

Synchronization cable

The maximum cable length between two IPBLs must not exceed 2000 meters.

- Cut the cable to the correct length.
- Connect the cable to a RJ45 modular jack. For information on pinning, see [figure 12](#) and [figure 13](#).
- Label the cable.

Sync IN

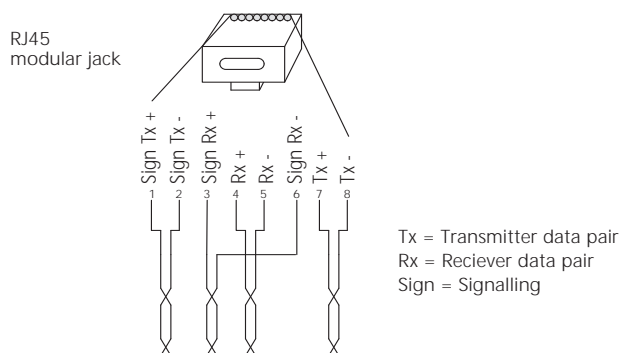
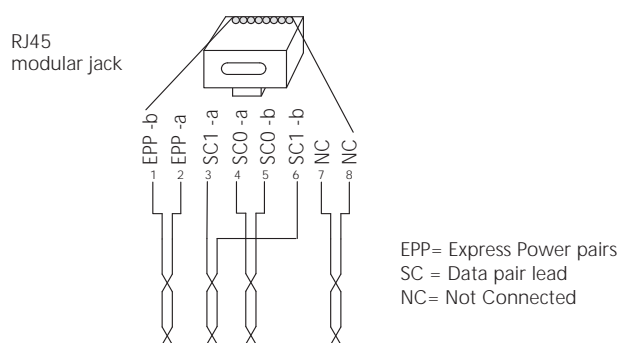


Figure 17. Connector pinning of the Sync IN cable

Sync OUT



028

Figure 18. Connector pinning of the Sync OUT cable

RFP cable

The RFP cable connects the IPBL with the RFPs. The maximum cable length between IPBL and a single RFP must not exceed 1500 meters.

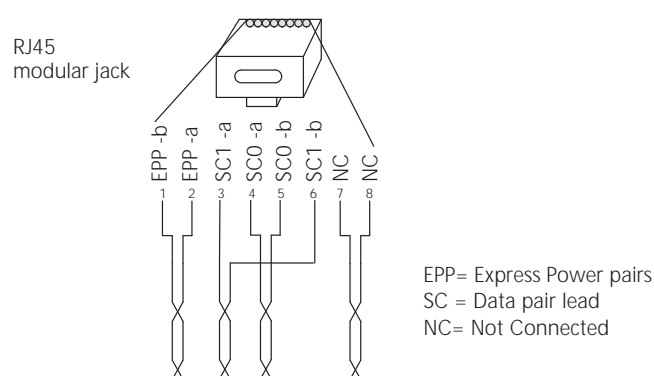
Note:

Ensure that during the installation, each RFP is given an extra length (5-10 metres) of cable because it is possible that it will have to be moved for one reason or another.

1. Cut the cable to the correct length.
2. Connect the cable to a RJ45 modular jack. For information on the pinning, see below.

Note:

If local power supply is used for the RFP, the EPP cable pairs must NOT be connected.



028

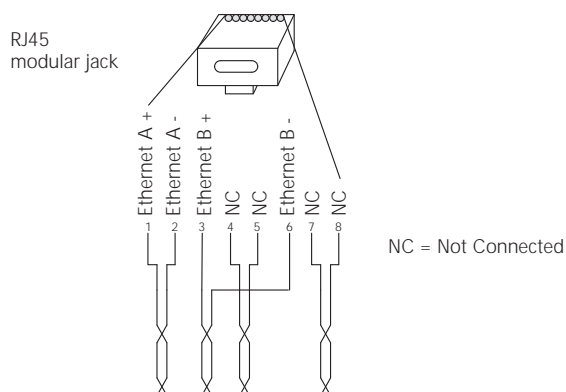
3. Label the cable.

LAN cable

Note:

The TX/RX crossover/straight cable feature does not work in the IPBL. It must be a straight cable between the IPBL and the switch port.

1. Cut the cable to the correct length.
2. Connect the cable to a RJ45 modular jack. For information on the pinning, see below.



029

3. Label the cable.

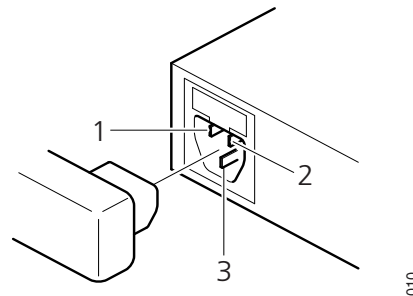
Power the IPBL

The IPBL power supply connector is located at the rear. The power supply feeds both the IPBL and the connected RFPs. The IPBL is powered with 110/230 VAC, 60/50 Hz.

110/230 VAC

- The 110/230VAC (100 – 240 VAC) power input is protected against overload by a 4A fuse. The IEC 60320 type C14 (male) connector consists of:
 - live lead (1)
 - neutral lead (2)
 - protective earth (3)

Figure 14.

*Figure 19. Pinning of the 110/230 VAC power supply*

1. Connect the power cable on the IPBL.
2. Connect the power cable in a wall socket with protected earth.
3. The IPBL is switched on.
4. Connect the cables in the following order:
 - Ethernet cable (A) LAN1 port must be used (LAN2 port is for administration only).
 - If you enable RSTP, both the ports are utilized by the system. See Enabling RSTP (only for IPBL) on page 132
 - Synchronization cable (ring sync, reference sync) (B)
 - Base station cable (RFP cable)

Note:

The connected RFPs must not be connected to protective earth.

5. Monitor the total current consumption from the GUI.
6. Ensure that the current consumption does not exceed the following values:

Note:

Max current consumption is 1,9/0,9 A when supplied with 110/230 VAC. The IPBL current consumption is 0.3 A.

Automatic Configuration

You can configure the device automatically using the configuration files.

Using BroadWorks Device Manager

1. In the BroadWorks Device Manager, configure IP-DECT device profile type.
2. Upload the provided customized configuration template files and firmware files to the BroadWorks Device Manager Server.
3. In the IP-DECT Base Station wizard, configure the IP-DECT Base Station for BroadWorks Device Manager Server.

Manual Configuration

This section describes how to configure IPBS and IPBL manually using the web interface. The recommended order to configure the equipment in the IP-DECT system is as follows:

1. Configure the Mobility Master (applicable only if SIP is used), see [Configure the Mobility Master](#) on page 72.
2. Configure the Standby Mobility Master (applicable only if SIP is used), see [Configure the Standby Mobility Master](#) on page 73.
3. Configure the Pari Master (applicable only if SIP is used), see [Configure the Pari Master](#) on page 73.
4. Configure the Standby Pari Master (applicable only if SIP is used), see [Configure the Standby Pari Master](#) on page 75.
5. Configure the Master, see [Configuring the Master](#) on page 76.
6. Configure the Standby Master, see [Configuring the Standby Master](#) on page 77.
7. Configure the slaves/radios, see [Configuring the Slave/Radio](#) on page 78.

Note:

When the IPBS or IPBL is reconfigured to another role (for example from being a Standby Master to becoming a Master), a factory reset should be done. See [Reset](#) on page 190.

Requirements

The following is required in order to configure the IP-DECT system:

- PC
- 10/100base-T Ethernet connection

Web Browser Requirements

To use the interface properly, the web browser has to meet the following requirements:

- HTTP 1.1 protocol
- HTML 4.0 protocol
- XML/XSL Version 1.0

The GUI has been tested with Internet Explorer 7.x and Firefox 3.x, but can also be operated with other browsers in compliance with the requirements above.

Access the GUI

The GUI interface is accessed through a standard web browser. It is possible to use the name, ipbs-xx-xx-xx (IPBS1), ipbs2-xx-xx-xx (IPBS2) and ipbl-xx-xx-xx (IPBL), where xx-xx-xx is the end of the MAC address.

Note:

To access the GUI for an device using secure web access (https), the certificate for the device can be installed in the web browser to avoid getting certificate error messages. See [Appendix D: Import Server Certificate in the web Browser](#) on page 217.

Note:

The IPBL name is always ipbl-xx-xx-xx regardless if LAN1 (MAC xx-xx-xx-xx-xx) or LAN2 (MAC yy-yy-yy-yy-yy) is used.

It is also accessed by entering http://xxx.xxx.xxx.xxx. In this address, xxx.xxx.xxx.xxx should be replaced with the IP address determined in [Determining the IP address](#) on page 62.

Access the GUI and change the default password as described in [Changing the default password](#) on page 65.

If mutual TLS authentication is used, before proceeding to the login page chose and confirm a trusted client certificate in the window displayed.

Note:

If the GUI cannot be accessed with Internet Explorer 8 or newer, ensure that the following TLS options are activated in the web browser under Tools > Internet Option > Advanced:

- Use TLS 1.0
- Use TLS 1.1
- Use TLS 1.2

Determining the IP address

The factory setting of the DHCP mode for the LAN1 port is "automatic", at first power up it will act as a DHCP client. If the network has a DHCP server, it will assign an IP address to the IPBS/IPBL. If there is no DHCP server in the network, the IPBS/IPBL can be assigned a predefined IP address. The factory setting of the DHCP mode is to the fixed IP address 192.168.0.1, see 8.2.1 Set [Setting the DHCP mode for IPv4](#) on page 109.

Note:

After the first startup the DHCP mode should be changed from "automatic" to either "client" or "off", see [Setting the DHCP mode for IPv4](#) on page 109.

This section describes how to determine the dynamically allocated IP address. The address is used to access the IPBS/IPBL using a web browser. Two methods are described:

- [In a Network without a DHCP Server](#) on page 63.
- [In a Network with a DHCP Server](#) on page 63.

In a Network without a DHCP Server

If the network does not have a DHCP server, and the DHCP mode is set to “automatic” (factory default), follow the steps below.

Note:

If the IPBS/IPBL has been used before, it must be restored to factory default settings by performing a long hardware reset, see [Reset Using the Reset Button](#) on page 191.

1. Connect an Ethernet cable between the IPBS/IPBL and the computer.

Note:

For IPBS, a power adapter must be used.

For IPBL, make sure to use the LAN1 port.

2. Ensure that the computer has an IP address within the same IP address range as the IPBS/IPBL (192.168.0.1).
3. Perform a hardware reset by shortly pressing the reset button.
The IPBS/IPBL will be assigned the IP address 192.168.0.1 and the netmask 255.255.255.0.
4. Enter http://192.168.0.1 in the browser to access the IPBS/IPBL GUI.
5. After the first startup, do the following:
On the IPBS: Select LAN1 > DHCP
On the IPBL: Select LAN1 > DHCP
6. In *Mode* drop-down list, change the DHCP mode from “automatic” to “disabled”.

In a Network with a DHCP Server

If the network has a DHCP server the IP address is determined following the steps below.

The IPBS's MAC address can be found on the label on the box and on the label on the backside. The IPBL's MAC address can be found on the label on the box. The hexadecimal numbers (xx-xx-xx-xx-xx-xx) represent the MAC address.

Note:

Make sure to use the LAN1 port for the IPBL.

Note:

In order to determine the IP address it is necessary that the computer is connected to the same LAN (broadcast domain) as the IPBS/IPBL.

Determine the IP address following the steps below:

Note:

If the IPBS/IPBL has been used before, it must be restored to factory default settings by performing a long hardware reset, see [Reset Using the Reset Button](#) on page 191. Then remove the power supply cable and connect it again.

1. Open a command window in windows by selecting Start > Run and enter "cmd" in the *Open:* text field.
2. Enter the following commands:

C:\>nbtstat -R

For IPBS1: C:\>nbtstat -a ipbs-xx-xx-xx

For IPBS2: C:\>nbtstat -a ipbs2-xx-xx-xx

For IPBL: C:\>nbtstat -a ipbl-xx-xx-xx

Where xx-xx-xx should be replaced with the last 6 hexadecimal digits of the MAC-address.

3. The IP address is displayed in the command window, see the white frame in figure below.

```

WINDOWS\system32\cmd.exe
nbtstat -R
Successful purge and preload of the NBT Remote Table
nbtstat -a ipbs-00-9f-b2
Local Area Connection:
IP Address: [172.20.14.28] Scope Id: [1]

NetBIOS Remote Machine Name Table

Name                Type                Status
-----
00-9f-b2            <00>                UNIQUE
20-14-128           <00>                UNIQUE
Address = 00-01-3E-00-9F-B2

```

4. Enter http://xxx.xxx.xxx.xxx (where xxx.xxx.xxx.xxx is the determined IP address) in the browser to access the GUI.
5. After the first startup of the IPBS/IPBL, do the following:
On the IPBS: Select LAN1 > DHCP
On the IPBL: Select LAN1 > DHCP
6. In *Mode* drop-down list, change the DHCP mode from "automatic" to "client" or "disabled".

Changing the default password

1. Enter the IP address, which was determined in *Determining the IP address*, in the web browser address field.
2. Select General > Admin.
3. Enter user name and password in the dialog box.
Default user name is: admin.
Default password is: changeme.
4. Enter a user name in the *User Name* text field.
5. Enter a password in the *Password* text field. Repeat the password in the second text field.
6. Click "OK".

GUI web access

Login page

When accessing IPBS/IPBL through a web browser, the initial page is the login page. This page has a drop-down list with two possibilities: *System Administration* and *DECT User Administration*.

Access levels

Three types of web users (or *Access Levels*) are authorized to access IPBS/IPBL:

- Auditors
- User Administrators
- System Administrators

The different types of access levels are described in the following table.

Access Level	Authorization	Login hyperlink on login page ^a	Described in section
Auditors	<ul style="list-style-type: none"> • Read access to device parameter settings • Can generate Service Reports 	System Administration	<i>Auditors</i>
User Administrators	<ul style="list-style-type: none"> • Add, update and remove users 	User Administration	User administrators on page 66

System Administrators	<ul style="list-style-type: none"> • Write access to all device parameter settings (for example IP addresses, software upgrades) • Assign and modify access to other System Administrator and User Administrator account settings • Add, update and remove users 	System Administration	System administrators on page 67
-----------------------	---	-----------------------	--

a. Different users should use the hyperlink related to their access level. The system does not allow login by a link not related to the user's access level.

Auditors

Auditors have read access to device parameter settings but are not authorized to update those settings. Auditors are also allowed to generate Service Reports (Administration > Diagnostics > Service Reports).

The login steps for an auditor follow the steps of a normal system administrator login. See [System administrators](#) on page 67 for more information.

User administrators

IPBS/IPBL is not supplied with preinstalled user administration accounts. Therefore, the first user administration account must be created by a system administrator (see [System administrators](#) on page 67). If additional user administration accounts are needed, they must also be created by a system administrator, see [Managing user administrators](#) on page 70.

User administrators can only administer users. They can view but not create or manage other user administrator accounts.

Logging in as user administrator

1. Follow [Access the GUI](#) on page 62 and access the device using a web browser.
2. From the drop-down list, select DECT User Administration.
3. In the fields below the drop-down list, enter user name and password for a user administrator.

If mutual TLS authentication is used, the user name is inserted automatically from the certificate. If a user certificate is required, this user name must be used for login. See [Require User Certificate](#) on page 87.

4. Click login.

If the login fails, the user is blocked for a certain period of time, and every failed login attempt increases the time while the user is blocked. The minimum blocked time is 5 seconds and the maximum time is 1800 seconds.

A welcome screen appears showing the current sessions, the last login date, and the number of failed login attempts. The failed login attempts counter shows only those login attempts when the user is not blocked.

5. Click OK.

The User Administration page is displayed.

See the figure below for a sample.

Users

PARK31100243400147

PARK

3rd party2110024615

Master Id0

show

User Administrators

Long Name

Name

User Administrators: 0

Users

No	Display	IPEI / IPDI	AC	Prod	SW	Registration
4007	Extn4007 4007	036470296844	1234			Subscribed
4008	Extn4008 4008	036470296867	1234			Subscribed
4009	Extn4009 4009	036470296858	1234			Subscribed
4002	Extn4002 4002	036470296780	1234			Subscribed
4000	abcdefghijklm 4000		1234			Not Subscribed
4003	Extn4003 4003	036470296893	1234			Subscribed
4004	Extn4004 4004	036470296789	1234			Subscribed
4005	Extn4005 4005	036470296803	1234			Subscribed
4006	Extn4006 4006	036470296831	1234			Subscribed

Users: 9

Figure 1. User Administration Sample.

The right side of the page consists of two list sections:

- *User Administrators* in the upper right section.

Note:

This section is read-only because a user administrator cannot manage other user administrators. See [Managing user administrators](#) on page 70.

- *Users* in the lower right section. Refer to [Add Users](#) on page 80.

System administrators

IPBS/IPBL devices are factory delivered with a default system administrator account.

Logging in as system administrator

1. Follow [Access the GUI](#) on page 62 and access the device using a web browser.
2. From the drop-down list, click *System Administration*.
3. Enter user name and password for a system administrator in the fields below the drop-down list.

If mutual TLS authentication is used, the user name is inserted automatically from the certificate. If a user certificate is required, this user name must be used for login. See [Require User Certificate](#) on page 87.

4. Click "Login".

If the login fails, the user is blocked for a certain period of time, and every failed login attempt increases the time while the user is blocked. The minimum blocked time is 5 seconds and the maximum time is 1800 seconds.

A welcome screen appears showing the current sessions, the last login date, and the number of failed login attempts. The failed login attempts counter shows only those login attempts when the user is not blocked.

5. Click "OK".

As a system administrator, you can do the following tasks:

- Managing the default system administrator account. See [Managing the default system administrator account](#) on page 68.
- Managing additional system administrator accounts. See [Managing additional administrator accounts](#) on page 69.

Managing the default system administrator account

The default system administrator account can be modified but cannot be deleted. To modify the default system administrator account, do as follows:

1. Log in as system administrator (see *Logging in as system administrator*).
2. Select General > Admin.
3. Select/Enter the following settings:

Field name	Description
• Device Name	Enter a description for the device.
• User Name	Enter a login user name.
• Password	Enter a password.
• Confirm Password	Confirm the password.

Note:

Only changing the password will not result in the settings being saved. For the settings to be saved, both user name and password must be updated at the same time!

4. Click "OK".

Managing additional administrator accounts

Note:

To create additional administrator accounts, Kerberos must have been configured (see [Centralized Management of Admin/Auditor Accounts Using Kerberos](#) on page 88).

Creating an additional administrator account

1. Log in as system administrator (see [Logging in as system administrator](#) on page 68).
2. Select General > Kerberos Server
3. On the next free account row in the Users section:
 - Enter User Name
 - Enter Password
 - Enter Password again
 - Select *Administrator* (for System Administrator) or *Auditor* in the drop-down list (See [Access levels](#) on page 65 for a description of access levels.)
4. Click "OK".

The account row is created.

Modifying an additional administrator account

1. Log in as system administrator (see [Logging in as system administrator](#) on page 68).
2. Select General > Kerberos Server
3. On an existing account row in the Users section:
 - Enter a new user name
 - Enter a new password
 - Enter the password again
 - Select *Administrator* (for System Administrator) or *Auditor* in the drop-down list (See [Access levels](#) on page 65 for a description of access levels.)
4. Click "OK".

The account row is updated.

Deleting an additional administrator account

1. Login as system administrator (see [Logging in as system administrator](#) on page 68).
2. Select General > Kerberos Server
3. On the row to be deleted, select the *Delete* check box.
4. Click "OK".

The account row is deleted.

Managing user administrators

Creating a user administrator

IPBS/IPBL is not supplied with preinstalled user administration accounts. Therefore, the first user administration account must be created by a system administrator. If additional user administration accounts are needed they must also be created by a system administrator.

1. Log in as System Administrator (see [Logging in as system administrator](#) on page 68).
2. Select "Users".
3. Click "show" .
4. The *User Administration* page (see [figure 1](#) on page 67 for a sample) is displayed.
5. Click "new".
6. Select the "User Administrator" radio box. The window layout transforms.
7. Enter a long name.
8. Enter a name (NOTE: This field is used for login).
9. Enter a password.
10. Confirm the password.
11. Click "OK".

Viewing and modifying a user administrator

1. Log in as System Administrator (see [System administrators](#) on page 67).
2. Select "Users".
3. Click "show".

A two-part list page is displayed. At the top are the user administrator accounts and below the user administrators are the user accounts, both listed in alphabetical order.

4. In the *User Administrators* section, click the hyperlink to be edited below the *Long Name* heading. An *Edit User* window is opened.
5. Select/Edit any of the following settings:
 - Long Name

- Name (NOTE: This field is used for login)
 - Password
 - Confirm Password
6. Click "OK".

Deleting a user administrator

1. Log in as System Administrator (see [System administrators](#) on page 67).
2. Select "Users".
3. Click "show".
4. In the *User Administrators* section, click the hyperlink to be deleted below the *Long Name* heading. An *Edit User* window is opened.
5. Click "Delete".

The User Administrator is deleted and the windows is closed.

Logout

Click "Logout" in the upper-right corner to log out of the device and close your session.

For automatic logout settings, see [Set Automatic Logout](#) on page 86.

Simplified GUI

The simplified Graphical User Interface (GUI) makes it very easy to configure small IP-DECT systems. Only those GUI pages are visible which are needed for a basic configuration so in the basic administration interface the required configuration settings are kept to a minimum.

The basic administration interface is the default setting for Compact IPBS.

Note:

This feature is only applicable for IPBS.

Changing the interface to Advanced View

To change the basic administration interface to the advanced view do the following:

1. Select General > Admin.
2. In the *Administration Mode* section select the "Show Advanced Options" check box.
3. Click "OK".
4. Refresh the web browser to make the hidden sub menus and tabs visible.

The screenshot shows the 'Admin' configuration page. At the top is a navigation bar with tabs: Info, Admin (selected), Update, NTP, Logging, HTTP, HTTP Client, SNMP, Kerberos Server, Certificates, and Provisioning. The main content area is divided into several sections:

- Admin**: Fields for Device Name (IPBS1), User Name (admin), Password (masked with dots), and Confirm Password (masked with dots). A note states: (A maximum of 15 characters are allowed.)
- Password Policy**: Fields for Minimum length (8), Number of character types (2), and Number of previous passwords not allowed (1). Checkboxes for 'Do not allow repeated characters' and 'Do not allow sequential characters' are both checked.
- Administration Mode**: A checkbox for 'Show Advanced Options' is checked.
- Delegated Authentication**: A link labeled 'Join realm'.
- Authentication Servers**: A table with columns: Realm/Domain, Address, Port, Secondary Address, Secondary Port, and Delete. The table is currently empty.

An 'OK' button is located at the bottom left of the form.

Changing the interface to Basic View

To change the advanced administration interface to the basic view do the following:

1. Select General > Admin.
2. In the *Administration Mode* section, clear the “Show Advanced Options” check box.
3. Click “OK”.
4. Refresh the web browser to decrease the number of visible sub menus and tabs.

Configure the Mobility Master

Note:

This section is applicable only if SIP protocol is used.

In a system with two or more Masters (Multiple Master system), a Mobility Master must be configured. For more information on Multiple Master Systems, see the applicable System Planning documentation for IP-DECT.

This section describes how to configure the Mobility Master. Each configuration step is briefly described in the step list below. For more detailed information see the corresponding subsection in [Operation](#) on page 85.

1. Determine the address and access the GUI, see [Access the GUI](#) on page 62.
2. Change the default password, see [Changing the default password](#) on page 65.

3. Set a static IP address and set DHCP to off, see [Setting a static IPv4 address](#) on page 110.
4. Set the mode to Mobility Master, see [Select Mobility Master Mode](#) on page 138.
5. Write a login name and enter a password, see [Select Mobility Master Mode](#) on page 138.
6. Connect to other Mobility Master(s), see [Connect Mobility Master to other Mobility Master\(s\)](#) on page 139.
7. Enter the Time Server address, see [Configuring the NTP settings](#) on page 100.

Configure the Standby Mobility Master

Note:

This section is applicable only if SIP protocol is used.

It is recommended to have a Standby Mobility Master in a Multiple Master IP-DECT system. This section describes how to configure the Standby Mobility Master. Each configuration step is briefly described in the step list below. For more detailed information see the corresponding subsection in [Operation](#) on page 85.

1. Determine the address and access the GUI, see [Access the GUI](#) on page 62.
2. Change the default password, see [Changing the default password](#) on page 65.
3. Set a static IP address and set DHCP to off, see [Setting a static IPv4 address](#) on page 110.
4. Set the mode to Standby Mobility Master, see [Select Mobility Master Mode](#) on page 138.
5. Enter the Primary Mobility Master IP address, see [Select Mobility Master Mode](#) on page 138.
6. Enter a login name and enter a password, this must be the same as in the Primary Mobility Master. See [Select Mobility Master Mode](#) on page 138.
7. Connect to other Mobility Master(s). This should be the same Mobility Master(s) as in the Primary Mobility Master, see [Connect Mobility Master to other Mobility Master\(s\)](#) on page 139.
8. Enter the Time Server address, see [Configuring the NTP settings](#) on page 100.

Configure the Pari Master

Note:

This section is applicable only if SIP protocol is used.

This section describes how to configure the Pari Master. Each configuration step is briefly described in the step list below. For more detailed information see the corresponding subsection in [Operation](#) on page 85.

1. Determine the address and access the GUI, see [Access the GUI](#) on page 62.
2. Change the default password, see [Changing the default password](#) on page 65.
3. *Note: This step is not needed if the Pari Master is configured as Mirror. In that case, jump to the next step.*
Configure LDAP user name and password, select the *Write Access* check box, see [Configure LDAP Server](#) on page 119.
4. Set a static IP address and set DHCP to off, see [Setting a static IPv4 address](#) on page 110.
5. Set the mode to Active or Mirror, see [Select Master mode](#) on page 131.
6. Perform a reset to restart the device in Active or Mirror mode, see [Reset](#) on page 190.
7. Select system name and password, see [Changing System Name and Password](#) on page 122.
8. Change subscription method, see [Setting Subscription Method](#) on page 123.
9. Configure authentication code, see [Configure Authentication Code](#) on page 123.
10. Select tones, see [Select Tones](#) on page 124.
11. Set default language, see [Set Default Language](#) on page 124.
12. Set frequency band, see [Set Frequency Band](#) on page 124.
13. Enable carriers, see [Enabling or disabling carriers](#) on page 125.
14. Enable local R-key handling, see [Enabling or disabling Local R-Key Handling](#) on page 125.
15. Enable No transfer on hangup, see [Enabling or disabling No Transfer on Hangup](#) on page 125.
16. Configure coder, see [Configure Coder](#) on page 128.
17. Select supplementary services, see [Configure Supplementary Services](#) on page 130.
18. Set Master Id, see [Set Master Id](#) on page 132.
19. Enable Pari function, see [Enable PARI function](#) on page 133.
20. Enter gatekeeper IP address or ID, see [Configure Gatekeeper](#) on page 133.
21. Connect to a Mobility Master, see [Connect Master to a Mobility Master](#) on page 140.
22. Assign PARI, see [Assign PARI](#) on page 146.
23. Enter SARI, see [Enter SARI](#) on page 146.
24. Enter AIWS2 IP address, see [Configure Messaging](#) on page 152.
25. Enter the Time Server address, see [Configuring the NTP settings](#) on page 100.

26. Reset in order to make the configuration changes take effect, see [Reset](#) on page 190.

Configure the Standby Pari Master

It is recommended to have a Standby Pari Master in the IP-DECT system. This section describes how to configure a Standby Pari Master. Each configuration step is briefly described in the step list below, for more detailed information see the corresponding subsection in [Operation](#) on page 85.

1. Determine the address and access the GUI, see [Access the GUI](#) on page 62
2. Change the default password, see [Changing the default password](#) on page 65.
3. *Note: This step is not needed if the Standby Pari Master is configured as Mirror. In that case, jump to the next step.*
Configure LDAP replicator, enter the IP address, user name and password to the LDAP server (Pari Master). Alternative LDAP server must not be entered. Select the *Enable* check box, see [Configure LDAP Replicator](#) on page 120.
4. Set a static IP address and set DHCP to off, see [Setting a static IPv4 address](#) on page 110.
5. Set the mode to Standby or Mirror, see [Select Master mode](#) on page 131.
6. Perform a reset to restart the device in Standby or Mirror mode, see [Reset](#) on page 190.
7. Enter system name and password, this should be the same system name and password as in the Pari Master, see [Changing System Name and Password](#) on page 122.
8. Select supplementary services, see [Configure Supplementary Services](#) on page 130.
9. Set Master Id, see [Set Master Id](#) on page 132.
10. Enable Pari function, see [Enable PARI function](#) on page 133.
11. Enter gatekeeper address, see [Configure Gatekeeper](#) on page 133.
12. Connect to a Mobility Master, see [Connect Master to a Mobility Master](#) on page 140.
13. Enter AIWS2 IP address, see [Configure Messaging](#) on page 152.
14. Enter the Time Server address, see [Configuring the NTP settings](#) on page 100.
15. Reset in order to make the configuration changes take effect, [Reset](#) on page 190.

Configuring the Master

This section describes how to configure the Master. Each configuration step is briefly described in the step list below. For more detailed information see the corresponding subsection in [Operation](#) on page 85.

1. Determine the address and access the GUI, see [Access the GUI](#) on page 62.
2. Change the default password, see [Changing the default password](#) on page 65.
3. Configure LDAP user name and password, select the *Write Access* check box, see [Configure LDAP Server](#) on page 119.

Note:

This step is not needed if the Master is configured as Mirror. In that case, jump to the next step.

4. Set a static IP address and set DHCP to off, see [Setting a static IPv4 address](#) on page 110.
5. Set the mode to Active or Mirror, see [Select Master mode](#) on page 131.
6. Perform a reset to restart the IPBS/IPBL in the selected mode, see [Reset](#) on page 190.
7. Select DECT > System and enter password.
8. Select system name and password, see [Changing System Name and Password](#) on page 122.
9. Set default language, see [Set Default Language](#) on page 124.
10. Select supplementary services, see [Configure Supplementary Services](#) on page 130.
11. Set frequency band, see [Set Frequency Band](#) on page 124.
12. Configure the Master settings, see [Configure Gatekeeper](#) on page 133.
13. Set the Master IP address to 127.0.0.1, see [Enter IP Address to PARI Master and the Standby Master](#) on page 145.
14. Perform a reset to restart the IPBS/IPBL in Master mode, see [Reset](#) on page 190.

If you encounter problem to access the Master from a certain PC after the reset:

- Open a command window in windows by selecting Start > Run and enter "cmd" in the Open: text field.
- Enter the following commands
 - arp -d (Delete the arp cache)
 - nbtstat -R (Empty the nbtstat cache)
- Restart the web browser.

15. Assign PARI, see [Assign PARI](#) on page 146.

16. Enter SARI, see [Enter SARI](#) on page 146.
17. Enter AIWS2 IP address, see [Configure Messaging](#) on page 152
18. Configure air synchronization, see [Configure Air Synchronization](#) on page 146.
19. Enter the Time Server address, see [Configuring the NTP settings](#) on page 100.
20. Reset in order to make the configuration changes take effect, see [Reset](#) on page 190.

Configuring the Standby Master

It is recommended to have a Standby Master in the IP-DECT system. This section describes how to configure a Standby Master. Each configuration step is briefly described in the step list below, for more detailed information see the corresponding subsection in [Operation](#) on page 85.

1. Determine the address and access the GUI, see [Access the GUI](#) on page 62.
2. Change the default password, see [Changing the default password](#) on page 65.
3. Configure LDAP replicator, enter the IP address, user name and password to the LDAP server. Alternative LDAP server must not be entered. Select the Enable check box. See [Configure LDAP Replicator](#) on page 120.

Note:

This step is not needed if the Standby Master is configured as Mirror. In that case, jump to the next step.

4. Set a static IP address and set DHCP to off, see [Setting a static IPv4 address](#) on page 110.
5. Enter system name and password, this should be the same system name and password as in the Master. See [Change User Name and Password](#) on page 86.
6. Enter Primary Master IP Address.
7. Set the mode to Standby Master, see [Select Master mode](#) on page 131.
8. Configure the Master settings, see [Configure Gatekeeper](#) on page 133.
9. Enter Master IP address, see [Enter IP Address to PARI Master and the Standby Master](#) on page 145.
10. Select supplementary services, see [Configure Supplementary Services](#) on page 130.
11. Assign PARI, see [Assign PARI](#) on page 146.
12. Configure air synchronization, see [Configure Air Synchronization](#) on page 146.
13. Enter WSM IP address, see [Configure Messaging](#) on page 152.
14. Enter the Time Server address, see [Configuring the NTP settings](#) on page 100.

15. Configure LDAP replicator, enter the IP address, user name and password to the LDAP server. Alternative LDAP server must not be entered. Check the Enable check box, see [Configure LDAP Replicator](#) on page 120.

16. Reset in order to make the configuration changes take effect, see [Reset](#) on page 190.

If you face problem to access the Standby Master from a certain PC after the reset:

- Open a command window in windows by selecting Start > Run and enter "cmd" in the Open: text field.
- Enter the following commands
arp -d(Delete the arp cache)
nbtstat -R(Empty the nbtstat cache)
- Restart the web browser.

Configuring the Slave/Radio

This section describes how to configure the Slave. Each configuration step is briefly described in the step list below, for more detailed information see the corresponding subsection in [Operation](#) on page 85.

Note:

When one Slave is configured, the configuration can be saved and uploaded to the other Slaves in the system.

1. Determine the address and access the GUI, see [Access the GUI](#) on page 62.
2. Change the default password, see [Changing the default password](#) on page 65.
3. Set DHCP mode to "Client", see [Setting dynamic IPv4 address using DHCP](#) on page 110.
4. Enable the Radio in the IPBS/IPBL, see [Enable or disable the radio](#) on page 144.
5. If the radio acts as a Standby Master, perform the following:
Configure LDAP replicator, enter the IP address, user name and password to the LDAP server and the alternative LDAP server. Check the Enable check box, see [Configure LDAP Replicator](#) on page 120.
6. Enter the system name and password, this must be the same system name and password as in the Master, see [Changing System Name and Password](#) on page 122.
7. With LDAP replication enabled, the password will be verified against the Master. If the password is wrong a single dot (.) will appear in the text field.
8. Set the mode to Slave, see [Select Master mode](#) on page 131.
9. Enter Master and Standby Master IP addresses, see [Enter IP Address to PARI Master and the Standby Master](#) on page 145.
10. Configure air synchronization, see [Configure Air Synchronization](#) on page 146.

11. Enter the Time Server address, see [Configuring the NTP settings](#) on page 100.
12. Reset in order to make the configuration changes take effect, see [Reset](#) on page 190.
13. Save the configuration of the Slave, see [Backup](#) on page 175.

Configure the rest of the IPBS/IPBL following the steps below:

Note:

Uploading the same configuration to all slaves can only be done if the DHCP is set to client.

14. Determine the address.
15. Select Update > Config, and browse to the previously saved configuration. Click "OK".
16. Reset in order to make the configuration changes take effect, see [Reset](#) on page 190.
17. Repeat Step 14 to Step 16 for all Slaves.

Configure deployment

This section describes how to configure an IPBS for deployment used for coverage test of air sync and speech.

Note:

For coverage test of air sync, two IPBSs must be configured, one as Sync Master and one as Sync Slave.

Each configuration step is briefly described in the following step list. For more detailed information see the corresponding subsection in [Operation](#) on page 85.

Configuring Sync Master IPBS

1. Set the Master mode to Deployment, see [Select Master mode](#) on page 131.
2. In the *Master IP Address* field, enter the loopback address 127.0.0.1, see [Enter IP Address to PARI Master and the Standby Master](#) on page 145.
3. Set the sync mode to Master, see [Configure Sync Master IPBS](#) on page 148.
4. If the IPBS shall be used without a network and a DHCP server, set a static IP address, see [Setting a static IPv4 address](#) on page 110.
Do as the following:
 - a. Select LAN > DHCP. In the *Mode* drop-down list, set the DHCP mode to "disabled".
 - b. Select LAN > IP. In the *IP Address* text field, enter an IP address, e.g. 192.168.0.1.
5. Reset the IPBS in order to make the configuration changes take effect, see [Reset](#) on page 190.

6. Select system name and password, see [Changing System Name and Password](#) on page 122.
7. Set frequency band, see [Set Frequency Band](#) on page 124.
8. Enter SARI, see [Enter SARI](#) on page 146.
9. Perform a reset to restart the IPBS, see [Reset](#) on page 190.
10. For coverage test of speech sync, register one handset in the IPBS configured as Sync Master, see [Add Users](#) on page 80.

Configuring Sync Slave IPBS

1. Set the Master mode to Deployment, see [Select Master mode](#) on page 131.
2. In the *Master IP Address* field, enter the loopback address 127.0.0.1, see [Enter IP Address to PARI Master and the Standby Master](#) on page 145.
3. Set the sync mode to Slave, see [Configure Sync Slave IPBS](#) on page 147.
4. If the IPBS shall be used without a network and a DHCP server, set a static IP address, see [Setting a static IPv4 address](#) on page 110.
Do as the following:
 - a. Select LAN > DHCP. In the *Mode* drop-down list, set the DHCP mode to "disabled".
 - b. Select LAN > IP. In the *IP Address* text field, enter an IP address, e.g. 192.168.0.1.
5. Reset the IPBS in order to make the configuration changes take effect, see [Reset](#) on page 190.
6. Select system name and password, see [Changing System Name and Password](#) on page 122.
7. Set frequency band, see [Set Frequency Band](#) on page 124.
8. Enter SARI, see [Enter SARI](#) on page 146.
9. Reset in order to make the configuration changes take effect, see [Reset](#) on page 190.
10. For coverage test of speech sync, register one handset in the IPBS configured as Sync Master, see [Add Users](#) on page 80.
11. Perform a reset to restart the IPBS, see [Reset](#) on page 190.

Add Users

This section describes how to add users to the IP-DECT system. The IPEI, which is the unique identification number of the handset, can be registered in two ways:

- Anonymous Registration can be used in an existing IP-DECT system. Instead of the administrator collecting all the handsets, the user of the handset does the registration. The IPEI is automatically associated to the user, see [Anonymous Registration](#) on page 81.
- Individual Registration can be used if a few new handsets shall be added to the IP-DECT System. The IPEI is entered manually, see [Individual Registration](#) on page 82.

Anonymous Registration

Anonymous Registration is done in two steps. First, the user is registered in the IP-DECT System. Second, the handset is assigned to the user from the handset.

Adding users in the IP-DECT system

1. Under *Administration*, select “Users”.
2. Click “New”.
3. Enter the following information in the corresponding text fields, leave the *IPEI / IPDI* text field empty, do not remove the automatically generated *Auth. Code*:

Field name	Description	Max. characters
Long Name	The name of the user, need to be unique throughout the system. This is the name presented in a called party's display, unless this is configured in the IP-PBX.	30
Display Name	Optional, will be shown in the handset display when the handset is idle.	30
Name	Optional, the user name.	30
Number	Mandatory, the phone number extension, need to be unique throughout the system.	30
Auth Name (SIP)	Auth name is the authentication name used in SIP authentication. If it is not set the Name will be used as authentication name. If SIP authentication is used or not is decided by the configuration in the IP-PBX.	60
Password	Optional, is used for registration towards the gatekeeper.	30

4. Click “OK”.
5. Repeat step 2 to 4 for all users.

Assigning handsets to users

1. Select DECT > System.

2. In the *Subscriptions* drop-down list, select “With System AC” to enable anonymous registration. Click “OK”.
3. Perform an “over air subscription” using the system Authentication Code. For information on how this is done, see the reference guide of the handset.
The handset IPDI number appears in the Anonymous list.
4. To view the list: Select Users > Anonymous.
5. Assign the handset to any user, subscribed or unsubscribed, on any Master defined in the system by calling the desired Master id & extension & optional individual AC code and hang up.
Example where **0** is the Master id, **200** is the extension and **1234** is the AC code:
*0*200*1234#. If **200** is occupied by another handset, the new handset will be assigned this identity and the old handset will be moved to the anonymous list when logging in the new handset.
NOTE: When using AC code, start with * and end with # character. Otherwise skip the *# characters.
 - Repeat step 3 - 4 for all handsets.

Note:

For safety reasons, when the Anonymous Registration is finished change the Subscription Method to “Disable” otherwise anyone with knowledge of the System AC could register to the IP-DECT System. See below for more information.

6. Select DECT > System.
7. Disable anonymous registration by selecting “Disable” in the Subscription drop-down list. Click “OK”.

Individual Registration

1. Select DECT > System.
2. In the *Subscriptions* drop-down list, select “With System AC” or “With User AC”. Click “OK”.



Tip:

For more information, see [Setting Subscription Method](#) on page 123.

3. Select “Users”.
4. Click “New”.
5. Enter the following information in the corresponding text fields:

Field name	Description	Max. characters
------------	-------------	-----------------

Long Name	Mandatory, the name of the user, need to be unique throughout the system. This is the name presented in a called party's display, unless this is configured in the IP-PBX.	30
Display Name	Optional, will be shown in the handset display when the handset is idle.	30
Name	Optional, the user name.	30
Number	Mandatory, the phone number extension, need to be unique throughout the system.	30
Auth. Name (SIP)	Auth name is the authentication name used in SIP authentication. If it is not set the Name will be used as authentication name. If SIP authentication is used or not is decided by the configuration in the IP-PBX.	60
Password	Optional, is used for registration towards the gatekeeper.	15
IPEI / IPDI	The unique identification number of the handset.	
Auth. Code	Optional, the individual authentication code for this user. Automatically created by default. Can be modified manually.	

6. Click "OK".
7. If "With User AC" have been selected as subscription method as in Step 2:
In the column "IPEI / IPDI", click on the blue text link for the user to allow subscription within 2 minutes.
8. Perform an "over air subscription" using the individual authentication code. For information on how this is done, see the reference guide of the handset.

User log in and log out

This section describes how to log out and log in users to the IP-DECT system. For example, when using a shared handset for shift workers.

Log out

For any subscribed user in the system, log out of the handset by calling the supplementary services feature for logout (see [Configure Supplementary Services](#) on page 130), optional individual AC code, and hang up.

Example where #11*\$# is the feature for logout and 1234 is the AC code: #11*1234#.

Log in

To log in a user, see [Assigning handsets to users](#) on page 81.

Operation

This section describes the settings in the Configuration and Administration menu, each subsection represents a sub menu to the Configuration and Administration menu.

Some changes require a reset in order to take effect. It is possible to do several changes before resetting the IPBS/IPBL.

The GUI for the IPBS and IPBL are similar. Screen shots from the IPBS are used as default.

General

This section describes how to do the following configurations and settings.

- Name the equipment
- Change Administrator User Name and Password
- Display Login Text
- Local Security Policy
- Kerberos
- Configure the NTP settings

Figure 2. Assigning a administrator name, username, and password.

Name the IPBS/IPBL

Each IPBS/IPBL can be assigned a name. It is recommended to assign a descriptive name for example IPBS/IPBL location.

1. Select General > Admin.
2. Enter a name in the Device Name text field.
3. Click "OK".

Change User Name and Password

The user name and password are used to access the IPBS/IPBL through the web GUI.

1. Select General > Admin.
2. Write a user name in the User Name text field.
3. Enter a new password in the Password text field. Repeat the password in the second text field.
4. Click "OK".

Display Login Text

An informative text or a security warning can be displayed on the login page to inform the user.

1. Select General > Admin.
2. Enter the desired text in the *Login Banner* text field.
3. Click "OK".

Set Automatic Logout

The user will automatically be logged out after being inactive for the time specified here. The feature is disabled if the field is empty.

1. Select General > Admin.
2. Enter the idle time in the *Automatic Logout after* field.
3. Click "OK".

Limit Sessions

The total number of parallel login sessions can be limited per user or per system. The feature is disabled if the fields are empty.

1. Select General > Admin.

2. Enter the allowed number of sessions per system and/or per user in the *Limit Sessions to* field.
3. Click “OK”.

Disable Native Authentication

The use of http authentication can be disabled and the form-based login is used all the time when user authentication is required. Native authentication is disabled by default.

1. Select General > Admin.
2. Select the *Disable Native Authentication* check box.
3. Click “OK”.

Require User Certificate

If mutual TLS is used to login, the device does not usually check that the trusted client certificate is issued to the user who is trying to login. For enhanced security the device can require that a trusted client certificate issued to the user is available to be able to login.

The following conditions must be met before enabling this feature:

- A trusted client certificate with the associated private key must be available in the web browser's certificate store. The *Subject Alternative Name* in the certificate must correspond to the User ID entered at login. See [Appendix E: Import Client Certificate in the Web Browser](#) on page 223.
- The trusted client certificate issued to the user or the CA certificate that signed client certificate must be added to the trust list in the device. See [Trust List](#) on page 102.
- Mutual TLS authentication must be enabled. See [Configure HTTP settings](#) on page 156.



Important:

Make sure that the correct certificate is installed before requiring a user certificate. If the correct certificate is not available, and mutual TLS authentication is enabled, it is not possible to access the device in any other way.

1. Select General > Admin.
2. Select the *Require Certificate* check box.
3. Click “OK”.

Centralized Management of Admin/Auditor Accounts Using Kerberos

In software version 3.x.x, each IPBS/IPBL had their own set of administrator/auditor accounts. Kerberos is a network authentication protocol that is used when you want to have the same set of user accounts for several IPBSs/IPBLs and then want to administrate these user accounts at one central location (Kerberos server). When an IPBS/IPBL is setup as a Kerberos server the IPBS/IPBL act as an authentication server for the rest of the IPBSs/IPBLs that are setup as client devices in the installation. The Kerberos server and the group of client devices constitute a domain called a realm. During Kerberos communication no password is actually sent over the network. Kerberos uses encrypted data packets (tickets) which are time-stamped and expire after a certain period of time. Therefore it is crucial to get the correct time across the system for which a NTP server should be used.

Set up the Kerberos server

It is recommended to set up the Kerberos server on the Master. To configure an IPBS/IPBL to act as a Kerberos server, do the following:

The screenshot shows the AVAYA IP-DECT Base Station configuration interface. The 'Kerberos Server' tab is selected under the 'Configuration' menu. The interface includes a sidebar with navigation options like General, LAN, IP, LDAP, DECT, Unite, Services, Administration, Users, Device Overview, DECT Sync, Traffic, Backup, Update, Diagnostics, and Reset. The main configuration area has fields for Password, Retype Password, Realm (set to IP-DECT), LDAP Replication, Master, Enable, and Use TLS. Below these are sections for Users and Trusted realms, each with a table for adding and managing accounts. The Users table has columns for Name, Password, Retype Password, Role, and Delete. The Trusted realms table has columns for Name, Password, Retype Password, Authorization, Admin Group RID, Auditor Group RID, and Delete. An 'OK' button is at the bottom of the configuration area.

Name	Password	Retype Password	Role	Delete
admin1	*****	*****	Administrator	<input type="checkbox"/>
auditor1	*****	*****	Auditor	<input type="checkbox"/>
joiner1	*****	*****	Join Realm	<input type="checkbox"/>
			Administrator	<input type="checkbox"/>

Name	Password	Retype Password	Authorization	Admin Group RID	Auditor Group RID	Delete
DOMAIN1.COM	*****	*****	Administrator			<input type="checkbox"/>
			Keep			<input type="checkbox"/>

Figure 3. Configure the Kerberos server.

1. Make sure that the IP address of a NTP time server is specified. Select General > NTP.
2. Select General > Kerberos Server.
3. Enter a root password for the Kerberos server. This password is used to encrypt the information stored on the server.
4. Click "OK".
5. The Kerberos server is enabled. Enter the realm name of your choice in the Realm field. The Kerberos realms are typically written in upper-case letters.

6. Select/Enter the following information for the users of the realm.

Field Name	Description
Name	Enter a login user name
Password	Enter a password
Retype Password	Confirm password
Role	<ul style="list-style-type: none"> Administrator: Write access to all device parameter settings . Auditor: Read access to device parameter settings. Join Realm: Add devices to the realm. This role is used only to add or remove devices in the realm. This role cannot be used to log in to the GUI.

7. Click "OK".

Set up the client

Depending on the type of system the IPBS/IPBL can be configured to act as a client in three different ways:

- Configure IPBS/IPBL as a client in a small existing system (few clients), see *Configure IPBS/IPBL as a client in a small existing system (few clients)*.
- Configure IPBS/IPBL as a client in a large existing system (many clients), see [Configure IPBS/IPBL as a client in a large existing system \(many clients\)](#) on page 91.
- Configure IPBS/IPBL as a client in a new system, see [Configure IPBS/IPBL as a client in a new system](#) on page 91.

Configure IPBS/IPBL as a client in a small existing system (few clients)

The location of the Kerberos server must be configured locally on each client. The server must be configured as a client as well so that it can also join the realm. To configure each IPBS/IPBL as a client, do the following:

- Make sure that the IP address of a NTP time server is specified. Select General > NTP.
- Select General > Admin.
- Go to the *Additional Kerberos encryption types* section.
- Select the *Enable AES and RC4* check box.
- Go to the Authentication Servers section.
- In the Realm/Domain text field, enter the realm name specified in the Kerberos server.

7. In the Address text field, enter the IP address of the Kerberos server. In the Kerberos server enter 127.0.0.1 (localhost) as the IP address. The Port and the *Admin Port* text fields are filled out automatically with default ports. Note: If other than default ports are used, in the text fields replace the default ports with the other ports.
8. In the *Secondary* Address text field, enter the IP address of the secondary Kerberos server. In the secondary Kerberos server enter 127.0.0.1 (localhost) as the IP address. The *Secondary Port* and the *Secondary Admin Port* text fields are filled out automatically with default ports. Note: If other than default ports are used, in the text fields replace the default ports with the other ports.
9. Click “OK”.

Join the realm

To enable delegated authentication using the Kerberos server, each client must join the Kerberos realm of the server. To join the realm, do the following:

IP-DECT Base Station

Info Admin Update NTP Logging HTTP HTTP Client SNMP Kerberos Server Certificates Provisioning

Admin

Device Name: TechDoc

User Name: admin

Password: [masked] (A maximum of 15 characters are allowed.)

Confirm Password: [masked]

Password Policy

Minimum length: 8

Number of character types: 1

Number of previous passwords not allowed: 1

Do not allow repeated characters: ☐

Do not allow sequential characters: ☐

Administration Mode

Show Advanced Options: ☒

Delegated Authentication

Kerberos Realm: IPDECT [Leave realm](#)

Host Name: ipbs-00-c7-26

Disable local authentication: ☐

Realm/Domain	Address	Port	Secondary Address	Secondary Port	Delete
IPDECT	127.0.0.1	88			<input type="checkbox"/>
					<input type="checkbox"/>

OK

Figure 4. Configure the Kerberos client.

1. Select General > Admin.
2. Click on the blue text link “Join realm” in the Delegated Authentication section.

3. In the Join Kerberos realm window, enter the following in the text fields:
 Realm: Enter the realm name of the Kerberos server.
 Host name: The MAC address of the device. Default value is used.
 Admin user name and Admin password: Enter the user name and password for a user with administrator account or join the realm account on the Kerberos server.
4. Click "Join".

Configure IPBS/IPBL as a client in a large existing system (many clients)

Requirements for IPBS/IPBL: Software version 6.1.X is required if Windows 2008 R2 server is used.

1. Setup the update server using the update script described in *Appendix C: Update Script for Configuration of Kerberos Clients*.
2. Select DECT > Radio config.
3. Go to the Update section.
4. In the Command File URL text field, enter the path to the update server and the name of the update script.
5. In the Interval (min) text field, enter the update period.
6. Click "OK".

After the script is executed and each Radio is restarted, the Kerberos client will join the Kerberos Server and it shall be possible to see all joined Kerberos clients in the bottom of the Kerberos Server tab.

The way the update script is done in *Appendix C: Update Script for Configuration of Kerberos Clients* it will automatically disable the local login possibilities if the joining was successful.

The password used in the script is now possible to change to a more secret password from the Kerberos server page.

It shall now be possible login to the Radio using the Kerberos login credentials, see [Log in using Kerberos](#) on page 92.

Configure IPBS/IPBL as a client in a new system

Precondition: The IPBS/IPBL must have software version 4.1.x or higher.

The idea is to use the Device Overview -> Add to configure the Radios and the Kerberos Client. By using this feature it is not needed to browse into each Radio for configuration.

The Radios are in broadcast mode which means none of them are attached to the Master and configured. If any of the Radios are attached to the master and configured, the Radios must be detached from the Master if this procedure shall work.

1. Select Device Overview > Radios.
2. Click "Add" to add the Radio to the Master.

3. In the Add Radio window, enter a name for the device. You can also add a Standby Master IP Address.
4. Go to the Kerberos section and enter the following in the text fields:
Realm: Enter the realm name of the Kerberos server.
Host name: Optional.
User: Enter the same user name defined in the Kerberos server.
Password: Enter the same password defined in the Kerberos server.
Disable local authentication: Select the Disable local authentication check box (recommended).
Enable AES and RC4: Select the Enable AES and RC4 check box
Overwrite existing: Select the Overwrite existing check box (optional).
5. Go to the Authentication Servers section.
6. In the Realm/Domain text field, enter the realm name specified in the Kerberos server.
7. In the Address text field, enter the IP address of the Kerberos server. In the Kerberos server enter 127.0.0.1 (localhost) as the IP address. The Port and the Admin Port text fields are filled out automatically with default ports. Note: If other than default ports are used, in the text fields replace the default ports with the other ports.
8. In the Secondary Address text field, enter the IP address of the secondary Kerberos server. In the secondary Kerberos server enter 127.0.0.1 (localhost) as the IP address. The Secondary Port and the Secondary Admin Port text fields are filled out automatically with default ports. Note: If other than default ports are used, in the text fields replace the default ports with the other ports
9. Click "OK".

Log in using Kerberos

1. Make sure that secure HTTPS protocol is used when logging in.
2. Log on to the client using a server account. When prompted for user name, the name of the realm has to be entered in front of the user name, separated by a backslash in the following way: REALM\username or username@REALM.

Disable local authentication

It is recommended to disable local authentication after Kerberos authentication is configured. It provides additional security and it is much easier to change the password of a user account or delete a compromised user account on the Kerberos server than changing the local user accounts on each IPBS/IPBL.

**Important:**

Make sure that the Kerberos authentication is working properly before disabling local authentication. If the Kerberos authentication is not working and local authentication is disabled it is not possible to access the IPBS/IPBL in any other way.

1. In the Delegated Authentication section select the Disable local authentication check box.
2. Click "OK".

Configure cross-realm authentication

Cross-realm authentication is used to authenticate users from another trusted realm. In this way it is possible for IP-DECT users to login to the IPBS/IPBL using their Windows user name and password in the Active Directory (AD). Security policies of the AD can then be used in IP-DECT. The trust relationship between the two realms is confirmed by configuring a shared password on both servers in the realms. This password is used to encrypt communication between the realms. To configure cross-realm authentication, do the following:

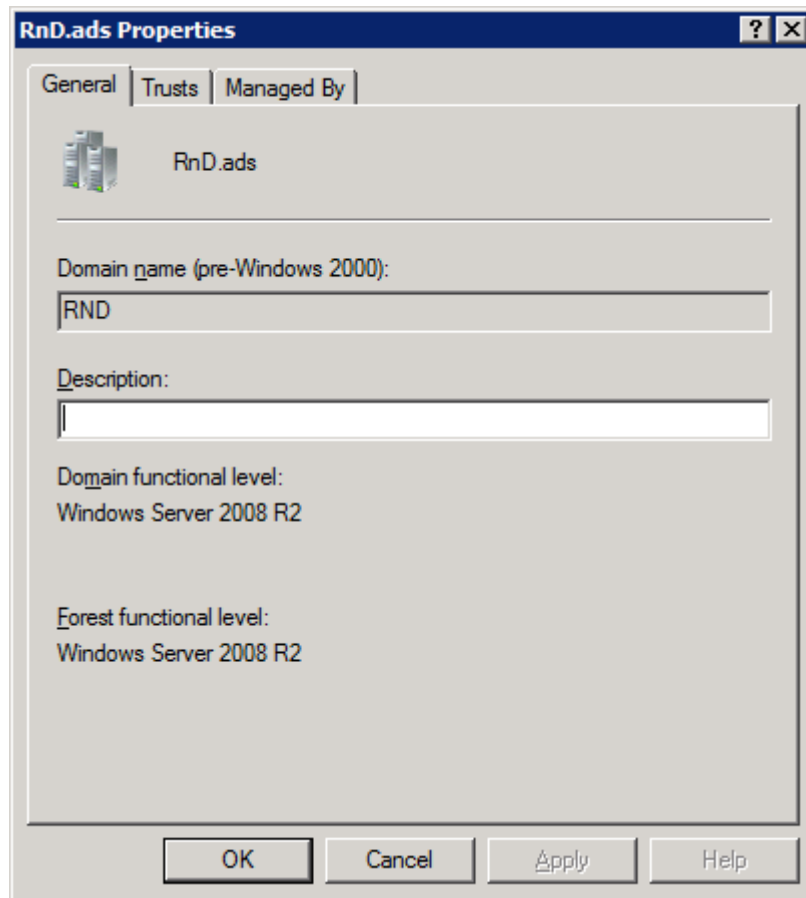
Requirements for IPBS1, IPBS2 and IPBL:

- Software version 6.1.X and later
- NTP configured
- Make sure that the device has been configured as a client in the system, see [Set up the client](#) on page 89.
- Make sure that the AES and RC4 encryption types are enabled. Select General > Admin and select the *Enable AES and RC4* check box.

AD Server configuration for Windows 2008 R2 servers

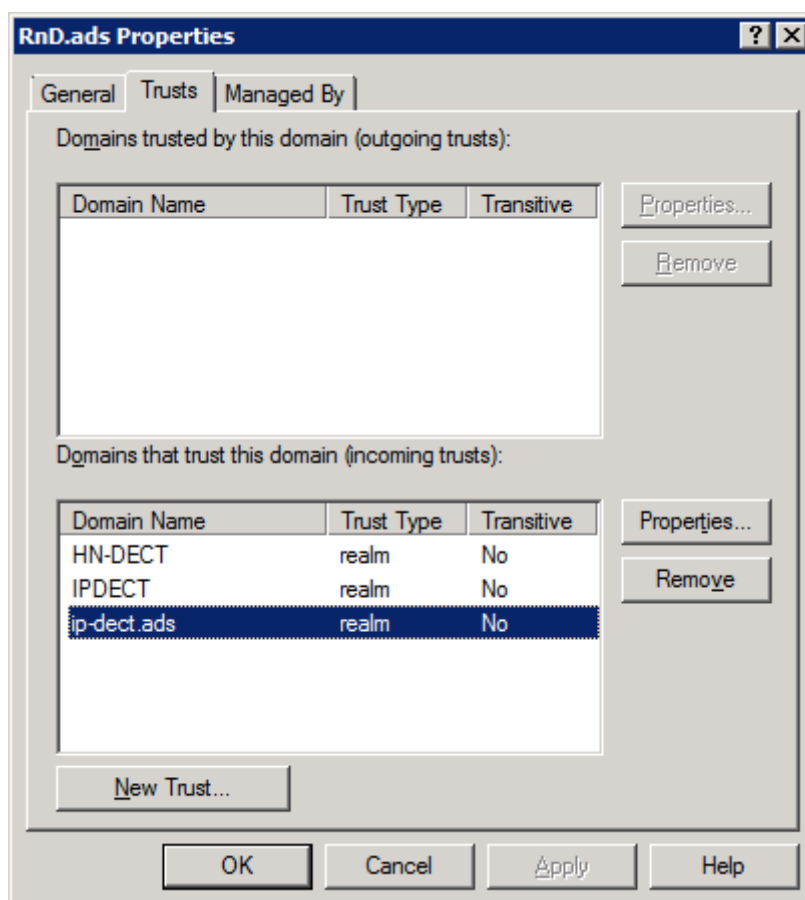
The trust relationship must be configured in the AD server.

1. Connect to the Windows 2008 R2 server.
2. In the Windows Start menu select Administrative Tools > Active Directory Domains and Trusts
3. Right-click the realm name you wish to establish a cross realm trust with and select "Properties".
4. Select the General tab and make a note of the windows realm name.

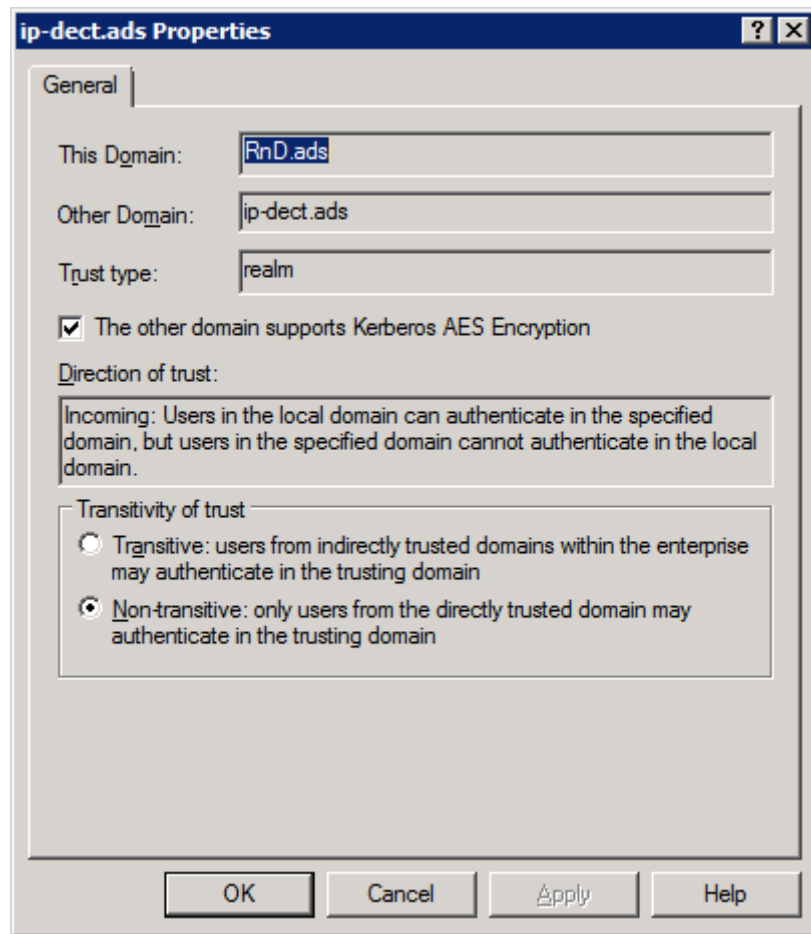


5. Click the Trusts tab and click "New Trust...".
6. The New Trust Wizard appears. Click "Next".
7. Enter the name of the Kerberos realm. Must be capital letters. Click "Next".
8. Select "Realm trust". Click "Next".
9. Select "Nontransitive". Click "Next".
10. Select "One-way incoming". Click "Next".
11. Enter a password that will be a shared secret between the AD server and the Kerberos server. Make a note of the password and click "Next".
12. Click "Next".
13. Click "Finish"

14. Click the Trusts tab. Select the realm that you have established a cross realm trust with and click “Properties...”.



15. Select the The other domain supports Kerberos AES Encryption check box.



16. Click "OK".

On IPBS1, IPBS2, and IPBL (the Kerberos server):

1. Select General > Kerberos Server.
2. In the Trusted *realms* section and the *Name* text field, enter the name of the realm of the AD server (see step 9). Must be capital letters.
3. In the *Password* text field, enter the password entered in step 13.
4. In the *Authorization* drop-down list, select "Use domain group" (recommended).

About "Use domain group", "Administrator" and "Auditor":

- "Use domain group": Only users belonging to a specified AD group will have administrator and auditor access rights.
- "Administrator": All Windows domain users have administrator access rights.
- "Auditor": All Windows domain users have auditor access rights.

5. In the *Admin Group RID* text field, specify the Relative Identifier (RID) of a Windows group with administrator rights.

In the *Auditor Group RID* text field, specify the Relative Identifier (RID) of a Windows group with auditor rights.

Note:

This step is only applicable if "Use domain group" is selected in the *Authorization* drop-down list as in the previous step.

The RID is the last part of the Security Identifier (SID) of a group.

Here is an example of a SID where the last five digits (in bold) are the RID:

S-1-5-21-4151926548-1272113248-3927039109-**11265**.

To determine the SID of a group, do as follows:

1. Start Windows Command Prompt (cmd.exe). To find Windows Command Prompt, enter "cmd.exe" in Windows Start Menu search field.
2. In Windows Command Prompt, enter "whoami /groups". This command displays the group information of the user logged in to the Windows domain.

6. Click "OK".

About security groups in AD

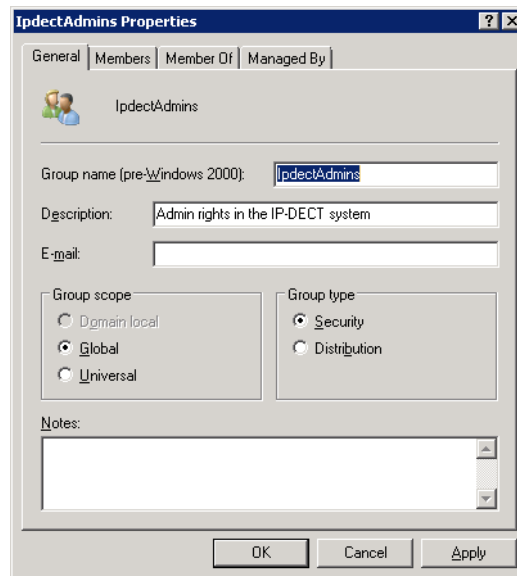
Groups are characterized by their scope and their type (security or distribution).

Using security groups, you can assign user rights to security groups in AD.

The scope of a security group determines the extent to which the security group is applied within a domain or forest. There are three scopes that can be selected when creating a security group:

- **Universal** - Can contain users/universal groups/global groups from all domains in the forest. Can PARTLY be used in trusted domains, but maybe makes little sense as only users/groups of the trusted domain will work in IP-DECT.
- **Global** - Can only contain users/global groups from the same domain. Can be used in trusted domains.
- **Domain Local** - Can contain any users/universal groups/global groups of the forest and domain local groups of the same domain. Can NOT be used in trusted domains.

With the above said, it is recommended to select Global as scope for security group.



On IPBS1, IPBS2, and IPBL (the client)

1. Select General > Admin.
2. In the *Authentication Servers* section and the *Realm/Domain* text field, enter the realm name of the AD server (see step 9). Must be capital letters.
Note: This has not to be done if a DNS server has been configured to be used in the IP-DECT system. In this case the clients will look up the needed information automatically.
3. In the *Address* text field, enter the IP address of the AD server.
4. Click "OK".

Log in using Kerberos cross-realm authentication

1. Make sure that secure HTTPS protocol is used when logging in.
2. Log in on the client using a Windows server account. When prompted for user name, the name of the Windows domain has to be entered in front of the user name, separated by a backslash in the following way: DOMAIN\username or username@DOMAIN.

Configure secondary Kerberos server

The Kerberos server is crucial when using Kerberos authentication, so it is recommended to have a secondary Kerberos server in the IP-DECT system. The secondary server is used if the primary server is not working properly. It is recommended to set up the secondary Kerberos server on the Standby Master. To configure an IPBS/IPBL as a secondary Kerberos server, do the following:

1. Make sure that the IP address of a NTP time server is specified. Select General > NTP.
2. Select General > Kerberos Server.

3. Enter the root password for the secondary Kerberos server which should be the same as the password used for the primary server. This password is used to encrypt the information stored on the server.
4. Click "OK".
5. The secondary Kerberos server is enabled. Enter the realm name in the Realm field.
6. LDAP is used to replicate the primary server database. Enter the IP address of the primary Kerberos server in the Master field in the LDAP Replication section. For more information about LDAP, see [Configure LDAP Server](#) on page 119.
7. Select the Enable check box.
8. Select the TLS check box.
9. Click "OK".
10. Click "OK" again to perform the LDAP replication.

Each client must also be configured with the secondary server information.

11. Select General > Admin.
12. Go to the Authentication Servers section.
13. In the Secondary Address text field of the Kerberos server, enter the IP address of the secondary Kerberos server. In the secondary Kerberos server enter 127.0.0.1 (localhost) as the IP address. The Port text field is filled out automatically.
14. Click "OK".

Delete a user or trusted realm

To delete a user account from the Kerberos server do the following:

1. Select General > Kerberos Server.
2. In the Users section select the Delete check box for the user to be deleted.
3. Click "OK".

To delete a trusted realm relationship from the Kerberos server do the following:

4. Select General > Kerberos Server.
5. In the Trusted Realms section select the Delete check box for the realm to be deleted.
6. Click "OK".

Deactivate Kerberos realm membership



Important:

Make sure that local authentication is enabled and working properly before leaving the Kerberos realm. If local authentication is still disabled and the IPBS/ IPBL is no longer a member of the realm it is not possible to access the IPBS/ IPBL in any other way.

1. Select General > Admin.
2. In the Delegated Authentication section clear the Disable local authentication check box.
3. Click "OK".

To deactivate the Kerberos membership for a client, do the following:

4. Select General > Admin.
5. Go to the Kerberos section and click on the blue text link "Leave realm".
6. Deactivate Kerberos realm membership in one of the following two ways:

- Deregister: The client is removed from the server database.

In the *Leave Kerberos realm* window, enter the user name and password for a user with administrator or join the realm account in the *Deregister with Kerberos server* section.

Click "Deregister".

- Delete: Leave the realm without removing data from the server.

Click "Delete".

Configuring the NTP settings

Since the device does not have a battery-backed real-time clock, the internal time will be set to 0:00 hrs, 1.1.1970 in the case of a restart.

In order to get the correct time in the system, specify the IP address of a NTP time server. The device will synchronize its internal clock to the time server at startup and at the specified intervals. The clock is, for example, used by the handsets and log files.

The screenshot shows the 'AVAYA IP-DECT Base Station' configuration window. The 'NTP' tab is selected in the top navigation bar. On the left, a sidebar lists configuration categories: General, LAN, IP, LDAP, DECT, Unite, Services, Administration, Users, and Device Overview. The main area displays NTP settings. The 'Time Server' field contains '172.20.8.100'. The 'Alt. Time Server' field is empty. The 'Interval [min]' is set to '60'. The 'Timezone' is set to 'Europe - Central European Time (UTC+1)'. The 'String' field contains 'CET-1CEST-2M3.5.0/2,M10.5.0/3'. The 'Current Server' is '172.20.8.100' and the 'Last Sync' is '05.06.2013 12:47'. An 'Active Settings' section on the right shows '172.20.8.100' and '60'. An 'OK' button is at the bottom.

Figure 5. Configure NTP settings

1. Select General > NTP.
2. Enter the IP address or the fully qualified domain name (FQDN) to the primary NTP server in the Time Server text field.
3. Enter the IP address or the fully qualified domain name (FQDN) to the alternate NTP server in the Alt. Time Server text field. The alternate server is used if the primary server is not working properly.

4. Enter a time interval in the Interval (min) text field.
5. Select time zone in Time zone drop-down list. If the desired time zone is not in the list, select "Other" and edit the String text field following the instructions in the next step.
6. Enter the timezone string if automatically updates summer/winter is desired.

<String = StdOffset [Dst[Offset], Date/Time, Date/Time]>

- Std = Time zone (for example EST for Eastern Standard Time).
- Offset = time difference between the timezone and the UTC (Universal Time Coordinator).
- Dst = summertime zone (for example EDT for Eastern Daylight Time).
- Second Offset = time difference between the summer time and the UTC.
- Date/ Time, Date/ Time = beginning and end of summertime.
 - date format = Mm.n.d (d day of n week in the m month)
 - time format = hh:mm:ss in 24-hour format.

Note that a week always starts on a Sunday and the number for Sunday is 0.

Example:

North Carolina is located in the Eastern Time Zone. Eastern Standard Time (EST) is 5 hours behind UTC (StdOffset = EST5), the Eastern Daylight Time (EDT) is 4 hours behind UTC (DstOffset = EDT4). Summertime for the year 2013 begins at two a clock, on a Sunday, the second week in March (M3.2.0/2). The summertime ends at two a clock, on a Sunday, the first week in November (M11.1.0/2).

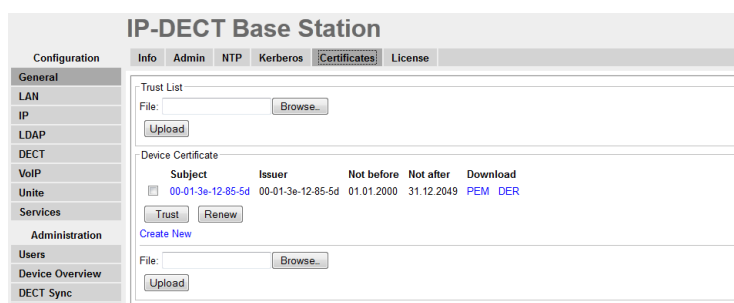
<String = EST5EDT4,M3.2.0/2,M11.1.0/2>

7. Click OK.

Certificates

The Certificates tab is part of IP Security in IP-DECT. For more information on IP Security, see chapter [IP4](#) on page 116.

Select General > Certificates.



Trust List

A trust list is set up when the device must know which third parties (for example IP-PBX) it shall trust in. The list contains the certificates to be accepted by the device for TLS secured connections (for example HTTPS, SIPS).

Subject	Issuer	Not before	Not after	Download
<input checked="" type="checkbox"/> ccmutv	ccmutv	04.03.2010	04.03.2015	PEM DER
<input type="checkbox"/> 00-01-3e-00-b6-b4	00-01-3e-00-b6-b4	07.03.2011	07.03.2012	PEM DER

[Remove](#) [Clear](#)

[Download all](#)

File: [Browse...](#)

[Upload](#)

The following table describes the different functions.

Field name	Description
Subject	Click the hyperlink (under the Subject header) to display certificate details in a window.
PEM	Click the PEM hyperlink (under the Download header) to download the certificate in PEM format.
DER	Click the DER hyperlink (under the Download header) to download the certificate in DER format.
Remove	To remove a certificate: Select the check box for the certificate and click the Remove button.
Clear	To remove all certificates from the trust list: Click the Clear button.
Download all	Click the Download all hyperlink (under the Remove button) to download the complete trust list as a PEM encoded text file.
Upload	Use the Upload function to upload a certificate file to the device. <ol style="list-style-type: none">1 Click the Browse button2 Select a certificate file3 Click the Upload button to upload the file to the device.

Rejected Certificates

This list contains the certificate chains that were rejected before, while trying to establish a secure TLS connection. This happens for example if the certificate is expired or neither the certificate nor any of the issuing CAs is trusted. If one of that certificates should be trusted for future connections you can select and add it to the trust list, directly.

The following table describes the different functions

Field name	Description
Subject	Click the name of a certificate to display its details in a window.
Clear	Discard all rejected certificate chains.
Trust	Click this button to add the selected certificates to the trust list and remove the corresponding chains from the rejected certificates..

Device Certificate

As described in [Certificate Handling Options with Device Certificates](#) on page 39, there are three possible certificate options:

1. Default device certificate, see [Default Device Certificate](#) on page 104.
2. Self-signed certificates, see [Self-signed Certificates](#) on page 104.
3. Certificates signed by a Certificate Authority (CA), see [Certificate Signing Request \(CSR\)](#) on page 105.
4. Import of Certificate Including Private Key (PKCS #12 file), see *Import of certificate*.

The following table describes the different functions.

Field name	Description
Subject	Click the hyperlink (under the Subject header) to display certificate details in a window.
PEM	Click the PEM hyperlink (under the Download header) to download the certificate in PEM format.
DER	Click the DER hyperlink (under the Download header) to download the certificate in DER format.
Trust	Click this button to add the selected certificates to the trust list.
Clear	This button is only displayed if a certificate was installed by the user, before. Click this button to discard the current device certificate and restore the standard certificate.
Create New	The Create New hyperlink is used for two purposes: <ul style="list-style-type: none"> • Self-signed Certificates on page 104 • Certificate Signing Request (CSR) on page 105

Upload

Use the Upload function to upload a certificate file to the device.

- 1 Click the Browse button
- 2 Select a certificate file
- 3 Click the Upload button to upload the file to the device.

NOTE: The Upload function requires a previously issued CSR to exist.

Default Device Certificate

This section corresponds to option 1 in [Device Management](#) on page 153.

If the default device certificate is missing for the device it will be generated, together with a key pair, when the IPBS is upgraded to version R3. The default certificate contains the MAC address of the device and will be valid for 10 years.

If the self-signed certificate is deleted and the device is restarted, a new certificate and key pair will be generated.

HTTPS is deactivated during the generation (creation) of the certificate.

The default certificate is a self-signed certificate. This means that certificates cannot be verified and thus the user/administrator will be prompted by the web browser to accept the certificate before it can be used. From this point on within the browser session (as long as the certificate is not changed) communication between the browser and the device is possible without further accept operations from the user/administrator.

If the device certificate is replaced or regenerated the user/administrator has to manually accept the new certificate.

Self-signed Certificates

This section corresponds to option 2 in [TLS Certificates](#) on page 39.

1. Select Configuration > General > Certificates.

Subject	Issuer	Not before	Not after	Download
00-01-3e-01-9c-8e	00-01-3e-01-9c-8e	01.01.2000	31.12.2049	PEM DER

[Create new](#)

File:

2. Click the "Create New" hyperlink in the Device Certificate section. A New Certificate window opens.
3. Select "Self-signed certificate" in the Type drop-down list.

4. Select/Enter the following settings:

Field name	Description
Key	Select either the desired key strength (1024-bit, 2048-bit, 4096-bit) or select to reuse the old key pair (this is not recommended).
Signature	Select which signature that shall be used for the certificate. Following signatures can be selected: SHA1, SHA256, SHA384, SHA512. The last three ones are SHA2 variants.
Validity	Enter the default validity in years. This is a mandatory field.
Common Name	Enter the domain name or IP address for the device. This is the same value as entered in the web browser when accessing the device.
DNS Name	If the device has got a DNS name it should be entered here. It will be stored as a subjectAltName (SAN) in the certificate. The format of this field is a FQDN (e.g. host.domain.com).

5. Click "OK".

6. A new key pair and a certificate will be created. This may take up to one hour depending on the key strength selected. During this time the device will be fully operational with the exception of https not working and the certificate tab pane not being visible.

Certificate Signing Request (CSR)

This section corresponds to option 3A & 3B in [TLS Certificates](#) on page 39. This will be the most common options for IP-DECT systems. For more information on CSRs see [Certificate Authorities](#) on page 38.

1. Select Configuration > General > Certificates.
2. Click the "Create New" hyperlink in the Device Certificate section. A New Certificate window will open.
3. Select "Signing Request" in the Type drop-down list.
4. Select/Enter the following settings:

Field name	Description
Key	Select the desired key strength (1024-bit, 2048-bit, 4096-bit) or select to reuse the old key pair (this is not recommended).

Signature	Select which signature that shall be used for the certificate. Following signatures can be selected: SHA1, SHA256, SHA384, SHA512. The last three ones are SHA2 variants.
Validity	This is an read-only information field indicating a default mandatory validity of 1 year. The time length of the validity is defined by the CA.
Common Name	Enter the domain name or IP address for the device. This is the same value as entered in the web browser when accessing the device.
DNS Name	If the device has got a DNS name it should be entered here. It will be stored as a subjectAltName (SAN) in the certificate. The format of this field is a FQDN (e.g. host.domain.com).

5. Click "OK". The windows closes.

A key pair and a CSR file will be created. This may take up to one hour depending on the key strength selected. During this time the device will be fully operational with the exception of https not working and the certificate tab pane not being visible.

When the CSR file has been generated it is visible in the Signing Request section of the Certificates page.

6. Download the CSR file by clicking the "PEM" or "DER" link in the Signing Request section.
7. Send the CSR file to your CA.
8. If successful, your CA will send back a digitally signed certificate file. This file should now be uploaded.
9. Select the certificate file.
10. Click "Upload".

Note:

If the CSR file generated in step 5 is deleted before receiving the reply from the CA (in step 8) it will not be possible to upload the signed certificate file in step 10. The system will automatically delete the CSR file when step 10 has completed.

Import of Certificate Including Private Key (PKCS #12 file)

This section corresponds to option 4 in [TLS Certificates](#) on page 39.

1. Select Configuration > General > Certificates.
2. In the Device Certificate section, click "Browse" to locate the PKCS #12 file. If the file is password protected, enter a password in the Password field.
3. Click "Upload".

Provisioning

Note:

Provisioning is only applicable when using IP-PBX.

Provisioning makes it easy to manage IP-DECT users from the IP-PBX without using the IP-DECT GUI. Provisioning is mainly configured in the IP-PBX but it must be enabled in the IPBS/IPBL. If provisioning is enabled user records in the IPBS/IPBL cannot be modified since all user data is mapped from the IP-PBX to the IPBS/IPBL.

Note:

Local users created in the IPBS/IPBL will be deleted when provisioning is enabled if no corresponding user exists in the IP-PBX.

Current view Primary

Enable ☒

Use HTTPS ☒

PBX IP Address

General HTTP settings

Base directory

User Name

Password

Update service sub directory and file name

Command File

Provisioning sub directory and file name

System data

User data

Status Inactive

Figure 6. Configure Provisioning

Provisioning can be enabled for one primary and one redundant IP-PBX. The redundant IP-PBX will act as a standby in case that the primary IP-PBX goes down. Repeat the below steps for both the primary and the redundant IP-PBX if both shall be used for Provisioning.

Note:

When enabling a redundant IP-PBX for Provisioning, make sure that the *PBX Resiliency* check box is selected (DECT > Master). Otherwise, Provisioning will not work for the redundant IP-PBX.

To enable provisioning, do the following:

1. Select Services > Provisioning.
2. In the Current view drop-down-list, select "Primary" or "Redundant".
3. Select the Enable check box.
4. The communication between the IPBS and the IP-PBX can be encrypted using https. Select the Use HTTPS check box to enable the encryption.
5. Specify the IP address of the IP-PBX in the PBX IP Address field.
6. The other values on the page are default values and filled out automatically.

Note:

These values will not be visible if the IPBS GUI is set to simplified mode.

7. Click "OK".
8. Reset the IPBS/IPBL to make the changes take effect, see [Reset](#) on page 190.

If the HTTPS protocol is used the IPBS/IPBL downloads a certificate from the IP-PBX to ensure a secure transaction. The IPBS/IPBL does not initially trust the certificate so it must be added manually to the trust list of the IPBS/IPBL. It is also possible that more than one certificate is downloaded creating a certificate chain. The root CA certificate is at the end of the chain which contains a self-signed signature and it is able to approve other certificate requests. It is recommended to add the root CA certificate to the IPBS trust list.

Note:

The connection to the IP-PBX will only be established after the certificate is acknowledged.

If the certificate expires, the ongoing connection is maintained but it will not be possible to start a new connection until the certificate is renewed.

To add a certificate to the trust list do the following:

9. Select General > Certificates.
10. In the Rejected certificates section select the check box of the certificate you want to trust.
11. Click "Trust".

For more information about certificate handling, see [Public Key Certificates \(Digital Certificates\)](#) on page 37.

Provisioning Modes

There are three different modes.

Active	The connection is up.
Inactive	Provisioning is not enabled for the currently viewed IP-PBX or the connection is used for the other IP-PBX.
Not connected	Provisioning is enabled for the currently viewed IP-PBX but the connection cannot be established or the connection is being established.

LAN

This section describes how to do the following configurations and settings in the device:

- Set DHCP mode
- Set IP static address
- Set dynamic IP address
- Set link type
- Configure VLAN
- Set 802.1X
- Enable RSTP (only for IPBL)
- View LAN statistics
- Deactivate LAN port (only for IPBL)
- Disable LLDP

Note:

The IPBL has two LAN ports. LAN1 port must be used in the IP-DECT system (LAN2 port is for administration only). This is not applicable when RSTP is used, see [Enabling RSTP \(only for IPBL\)](#) on page 114.

The IP-DECT system supports dual-stack, so both IPv4 and IPv6 addresses can be used simultaneously.

Some of the above configurations and settings plus additional ones can be set by a DHCP server via DHCP options. For more information about DHCP options, see [Appendix G: Configure DHCP Options](#) on page 229.

Setting the DHCP mode for IPv4

The IPBS/IPBL can have different DHCP modes, see the table below.

Disabled	Used if the IPBS/IPBL should have a static IP address.
Client	The IPBS/IPBL acts as a DHCP Client, if there is a DHCP server in the network it will be assigned an IP address
Automatic	In automatic DHCP mode the IPBS/IPBL will act as a DHCP client on power up. If the IPBS/IPBL is restarted by shortly pressing the reset button it will get the IP address 192.168.0.1 and the netmask 255.255.255.0 for the LAN1 port.

Change DHCP mode following the steps below.

1. On the IPBS: Select LAN > DHCP4.
On the IPBL: Select LAN1 > DHCP4.
2. Select DHCP mode in the *Mode* drop-down list.
3. Click "OK".
4. If "Client" or "Automatic" is set, reset to make the changes take effect. See [Reset](#) on page 190.

Setting a static IPv4 address

It is necessary for the Master and the Standby Master to have static IP addresses. The Slaves can have dynamic IP addresses retrieved from the network DHCP server.

Ask the network administrator to reserve an IP address for the Master and Standby Master.

1. On the IPBS: Select LAN > DHCP4.
On the IPBL: Select LAN1 > DHCP4.
2. Select "Disabled" in the *Mode* drop-down list.
3. Click "OK".
4. Do NOT reset the device yet. Set a static IP address first.
5. On the IPBS: Select LAN > IP4.
On the IPBL: Select LAN1 > IP4.
6. Enter "IP Address", "Network Mask", "Default Gateway" and "DNS Server" addresses provided by the network administrator in the text fields.

You can enter an alternative DNS Server in the Alt. DNS Server text field and select the Check ARP check box to detect and prevent ARP poisoning attacks.

You can also configure an alternative gateway under Static IP Routes if a specific IP address should use another gateway instead of the default one.

7. Click "OK".
8. Reset in order to make the changes take effect, see [Reset](#) on page 190.
9. Start the web-based configuration, using the static IP address.

Setting dynamic IPv4 address using DHCP

The Radios can have dynamic IPv4 address allocation if the network has an DHCP server.

1. On the IPBS: Select LAN > DHCP4.
On the IPBL: Select LAN1 > DHCP4.
2. Select "Client" in the *Mode* drop-down list.
3. Select "Selected Server only" if the device should accept a lease only from a selected DHCP server.

4. Enter the number of seconds the device waits for a lease from the selected DHCP server before accepting a lease from another server in the "Wait for selected Server" field.
5. If several DHCP servers are available, enter the object identifier (DHCP vendor option 250 value) of the selected DHCP server in the "Server Identifier" field. For example, 1.3.6.1.4.1.27614.1.1.
6. The device sends a default hostname to the server. Enter an alternative hostname in the "Hostname" field to change the default name. Up to 63 alphanumeric characters are allowed.
7. Click "OK".
8. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Note:

If the DHCP lease time is shorter than the time-to-live of the name/IP address association in the Windows Internet Name Service (WINS) server, it may cause a mismatch, and a wrong device may be reached if its WINS name is used.

Set DHCP Mode for IPv6

The device can have different DHCP modes for IPv6, see the table below.

Disabled	Used if the device should have a static IP address.
Inform	The device can receive DHCP options, but it will use its automatically assigned IP addresses.
Client	The device acts as a DHCP client. If there is a DHCP server in the network, it will be assigned an IP address.

Change DHCP mode following the steps below.

1. On the IPBS: Select LAN > DHCP6.
On the IPBL: Select LAN1 > DHCP6.
2. Select DHCP mode in the Mode drop-down list.
3. Click "OK".
4. If "Client" is set, reset to make the changes take effect. See [Reset](#) on page 190.

Dynamic IPv6 address via DHCP

The Radios can have dynamic IPv6 address allocation if the network has an DHCPv6 server.

1. On the IPBS: Select LAN > DHCP6.
On the IPBL: Select LAN1 > DHCP6.
2. Select "Client" in the Mode drop-down list.

3. Select "Selected Server only" if the device should accept a lease only from a selected DHCP server.
4. Enter the number of seconds the device waits for a lease from the selected DHCP server before accepting a lease from another server in the "Wait for selected Server" field.
5. If several DHCP servers are available, enter the object identifier (DHCP vendor option 250 value) of the selected DHCP server in the "Server Identifier" field. For example, 1.3.6.1.4.1.27614.1.1.
6. The device sends a default hostname to the server. Enter an alternative hostname in the "Hostname" field to change the default name. Up to 63 alphanumeric characters are allowed.
7. Click "OK".
8. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Set an Automatic IPv6 Address

The IPv6 protocol supports stateless address autoconfiguration. It means that the device gets a link-local IPv6 address and a default gateway automatically. For IPv6 configuration, automatic address assignment is the default setting.

To view the assigned IPv6 address:

1. On the IPBS: Select LAN > IP6.
On the IPBL: Select LAN1 > IP6.
2. The address is shown under *Addresses*.

You can also configure an alternative gateway under *Static IP Routes* if a specific IP address should use another gateway instead of the default one.

Set a Static IPv6 Address

It is necessary for the Master and the Standby Master to have static IP addresses. The Slaves can have dynamic IP addresses retrieved from the network DHCP server.

Ask the network administrator to reserve an IPv6 address for the Master and Standby Master.

1. On the IPBS: Select LAN > DHCP6.
On the IPBL: Select LAN1 > DHCP6.
2. Select "Disabled" in the Mode drop-down list.
3. Click "OK".
4. Do NOT reset the device yet. Set a static IP address first.
5. On the IPBS: Select LAN > IP6.
On the IPBL: Select LAN1 > IP6.
6. Select "Static" in the Mode drop-down list.

7. Enter the "IP Address", "Prefix" and "Default Gateway" addresses provided by the network administrator in the text fields.

You can also configure an alternative gateway under Static IP Routes if a specific IP address should use another gateway instead of the default one.

8. Click "OK".
9. Reset in order to make the changes take effect, see [Reset](#) on page 190.
10. Start the web-based configuration, using the static IP address.

Setting link type

1. Do one of the following:
 - On the IPBS: Select LAN > Link.
 - On the IPBL: Select LAN1 > Link.

The link setting should be set to "auto" under all normal circumstances.

Configuring VLAN

Identity and priority settings for VLAN are done in the "LAN > VLAN" sub menu.

Note:

It is necessary to have a VLAN with the same ID as configured in the IPBS/IPBL, otherwise it will not be possible to access the IPBS/IPBL.

Note:

If "VLAN = 0", the Quality of Service (QoS) is inactive according to 802.1q. It is also recommended to avoid "VLAN = 1" as it often is used as a default VLAN setting.

Setting 802.1.x

The 802.1X standard is used for authentication when connecting to the LAN. EAP-MD5 and EAP-TLS are supported. The EAP-MD5 fields must be filled out even if EAP-TLS is used. If EAP-TLS is used, a certificate must be available at General > Certificates > Device Certificate.



Important:

Currently Avaya IP-DECT system does not support EAP-TLS.

1. Select LAN > 802.1X.
2. Enter the user name for the authentication in the User text field.

3. Enter the corresponding password for EAP-MD5 or an arbitrary text for EAP-TLS in the Password text field.
4. Click "OK".

Viewing LAN statistics

1. To view statistics of LAN events, do one of the following:
 - On the IPBS: Select LAN > Statistics.
 - On the IPBL: Select LAN1 > Statistics.

To reset the ethernet statistics counters, click "Clear".

Enabling RSTP (only for IPBL)

The RSTP (Rapid Spanning Tree Protocol) function is provided for IPBLs connected to a redundant bridged network when an IPBL must stay operational even if a network port or a bridge in the network fails. If RSTP is enabled LAN1 is assumed to be the primary port and LAN2 the backup port. RSTP packets are sent over both ports. From received RSTP packets it is learned which port shall be used for data traffic. The port to be used for data traffic may change whenever the network topology changes, i.e. when a link between bridges goes down or up or a bridge is added. On each such change the IP stack is moved to the selected port without disruption of data traffic.

Before RSTP can be enabled the following preconditions must be met:

- The bridges in the network should support RSTP.
- LAN1 and LAN2 should be connected to RSTP enabled bridge ports.
- LAN1 and LAN2 should be connected to different bridges.
- LAN1 must be configured for a static IP address. See [Setting a static IPv4 address](#) on page 110.
- Select LAN1 > IP. Make sure that the *Check ARP* and the *Disable* check boxes are unchecked.
- Select LAN2 > IP. Select the *Disable* check box.
- Select LAN2 > DHCP. Select *disabled* in the *Mode* drop-down list.
- Select LAN1 > VLAN. Check that VLAN is not enabled.
- Select LAN2 > VLAN. Check that VLAN is not enabled.

To enable RSTP:

1. Select LAN1 > RSTP.
2. Select the *Enable* check box.

3. To trace events triggering RSTP state machine actions and the associated events: Select the *Trace Actions* check box.
4. Click "OK".

Deactivating LAN port (only for IPBL)

To deactivate LAN port:

1. Select LAN2 > IP.
2. Select the Disable check box.
3. Click "OK".

The LAN2 port is for administration only and it is the port you in normal case are interested in deactivating. This is not applicable when RSTP is used.

Disabling LLDP

LLDP (Link Layer Discovery Protocol) is a vendor-neutral link layer protocol used by network devices for advertising their identity, capabilities, and neighbors on an IEEE 802 local area network.

LLDP is enabled by default and can be disabled in order to prevent the IP-DECT device to get VLAN settings through the LLDP protocol. To disable LLDP, do as follows:

1. Select LAN > LLDP.
2. Select the Disable check box.
3. Click "OK".

IP4

Configuring IP4 settings

The following settings can be done in the IP4 settings sub menu:

ToS priority, RTP Data and VoIP Signalling:	Determines the priority from the ToS field in the IP header. This function can be used if the router can use ToS priority control. Hexadecimal, octal or decimal values can be used; 0x10, 020 and 16 are all equivalent. There are two fields for ToS priority, one for RTP Data and one for VoIP Signalling ^a . Other types of traffic (for example http and ldap) are not prioritized and use 0x00. NOTE: Remember that the same value should be set in the ToS field for all devices.
RTP ports:	If the ports fields are left blank, the ports 16384 to 65535 will be used.

a. VoIP Signaling includes roaming, handover, registrations towards the IP-PBX etc.

Note:

These settings are valid for IPv6 as well.

1. Select IP4 > Settings.
2. Enter the ToS priority value (recommended value is "0xb8") in the ToS Priority - RTP Data text field.
3. Enter the ToS priority value (recommended value is "0x68") in the *ToS Priority - VoIP Signaling* text field.
4. Select which ports to use for RTP traffic by entering the first port in the First UDP-RTP Port text field.
5. Enter the number of ports to use in the Number of Ports text field.
6. Click "OK".

Routing

View the IP4 routing by Select IP4 > Routing.

Note:

The IPBL has two LAN ports. LAN1 port must be used in the IP-DECT system (LAN2 port is for administration only). This is not applicable when RSTP is used, see [Enabling RSTP \(only for IPBL\)](#) on page 114.

TLS

The following TLS versions are supported:

- TLS 1.0
- TLS 1.1
- TLS 1.2

The following TLS versions and cipher suits can be configured:

Normal	Enables all supported versions and ciphers. Most recent versions and most secure ciphers have priority.
Fast	Enables all supported versions and ciphers. The fastest ciphers have priority, but they provide less security.
Highest security	Only the most recent supported TLS version and secure ciphers are enabled. This setting might cause compatibility issues.

To set the TLS profile, do the following:

1. Select IP4 > TLS.
2. Select the TLS profile in the Profile drop-down list.
3. Click OK.

IP6

Routing

View the IPv6 routing by selecting IP6 > Routing.

Note:

The IPBL has two LAN ports. LAN1 port must be used in the IP-DECT system (LAN2 port is for administration only). This is not applicable when RSTP is used, see [Enabling RSTP \(only for IPBL\)](#) on page 114.

TLS

The following TLS versions are supported:

- TLS 1.0
- TLS 1.1
- TLS 1.2

The following TLS versions and cipher suits can be configured:

Normal	Enables all supported versions and ciphers. Most recent versions and most secure ciphers have priority.
Fast	Enables all supported versions and ciphers. The fastest ciphers have priority, but they provide less security.
Highest security	Only the most recent supported TLS version and secure ciphers are enabled. This setting might cause compatibility issues.

To set the TLS profile, do the following:

1. Select IP6 > TLS.
2. Select the TLS profile in the Profile drop-down list.
3. Click "OK".

LDAP

The Lightweight Directory Access Protocol (LDAP) protocol is required for systems in which the server and a replicating client access a joint user database. All IPBSs/IPBLs in the system have access to the database, one of the IPBSs/IPBLs can be configured to be the LDAP server.

The joint user database contains information about the users registered in the system. It also contains the system configuration, that is the configurations made under the DECT menu.

This section describes how to do the following configurations and settings.

- Configure LDAP Server
- Check LDAP Server Status
- Configure LDAP Replicator
- Check LDAP Replicator Status

Configure LDAP Server

The IP-DECT system needs an LDAP server. If the PBX is set up as an LDAP server, the Master should be set up as an LDAP Replicator. If the Master is set up as an LDAP Server, the Standby Master could be set up as an LDAP Replicator, see [Configure LDAP Replicator](#) on page 120.

Setting up the IPBS/IPBL as an LDAP server

Note:

The selected user name and password must be the same in both the Master and the Standby Master. If a Multi Master system is used, the Masters must also have the same user name and password.

1. Select LDAP > Server.
2. Add a user, for example ldap-user, in the User text field.
3. Enter a password in the Password text field.
4. Select the Write Access check box.
5. Click "OK".

User	Password	Write Access
ldapTstuser	••••	<input checked="" type="checkbox"/>
		<input type="checkbox"/>

OK Cancel

039

Checking LDAP Server Status

Select LDAP > Server Status.

The following information is displayed:

- connections - Total number of active connections to the LDAP server
- write connections - Number of write-enabled connections
- rx search - Number of received search requests
- rx modify - Number of received change requests
- rx add - Number of added objects
- rx del - Number of deleted objects
- rx abandon - Number of lost connections
- tx notify - Number of sent change notifications

- tx error - Number of sent error notifications
- tx error 49 - Number of sent error notifications due to invalid credentials
- tx error 50 - Number of sent error notifications due to insufficient access rights

Configure LDAP Replicator

LDAP Replicators are usually configured in the following cases:

- User data is replicated from the Master to the Standby Master. The replicator is configured on the Standby Master (Full Directory Replication)
- User data is replicated from the PBX to the Master. The replicator is configured on the Master (Full Directory Replication)

Configure Full Directory Replication

1. Select LDAP > Replicator.
2. Select the Enable check box.
3. Enter the IP address to the LDAP server in the Server text field.
4. Enter the IP address to the alternative LDAP server in the Alt. Server text field.
5. NOTE: If this IPBS/IPBL is configured as an alternative/standby LDAP server, enter "0.0.0.0" in the Alt. Server text field.
6. Select a filter method from the Filter Type drop-down list:
 - Dect Gateway Name - Enter the name of the DECT gateway to limit the replication to users of a certain group
 - LDAP Filter - Enter an LDAP filter to limit replication to certain LDAP objects
7. Enter the LDAP User name and Password in the User and Password text fields.
8. Click "OK".

Note:

In the case of Master to Standby Master Full Directory Replication, do not register new handsets when the LDAP Server is down even if there is a Standby LDAP Server in the system.

Check LDAP Replicator Status

1. Select LDAP > Replicator-Status.

The following information is displayed:

- Server - The IP address and port of the LDAP server.

- Remote - State of replication in the source directory. Three states are possible: Stopped, Active, Completed
- Notify - Number of change notifications received from the server
- Paged - Number of objects received from AD server in response to paged search requests
- No match - Number of objects received that are not matching the configured LDAP filter condition
- Discarded - Number of objects discarded because no suitable map is found
- Local - State of replication in the destination directory. Three states are possible: Stopped, Active, Completed
- Notify - Number of change notifications sent to the server
- Add - Number of locally added objects
- Del - Number of locally deleted objects
- Modify - Number of locally modified objects
- Pending - Number of local objects waiting to be sent to the server

Expert tool

The Expert function should only be used after consultation with Avaya Technical Support.

DECT

This section describes how to do the following configurations and settings.

- Change System Name and password
- Change Subscription Method
- Configure Authentication Code
- Select Tones
- Set Default Language
- Set Frequency Band
- Enable/Disable Carriers
- Enable/Disable Local R-Key Handling
- Enable/Disable No Transfer on Hangup
- Enable/Disable No On-Hold Display
- Enable/Disable Display Original Called

- Disable ICE Support
- Wideband Audio
- Enable/Disable Early Encryption
- Configure Coder
- Secure RTP
- Configure Supplementary Services
- Select Master Mode
- Enable PARI Function
- Configure Gatekeeper
- Registration for Anonymous Devices
- Configure Trunks
- Select Crypto Master mode
- Select Mobility Master mode
- Connect Mobility Master to other Mobility Master(s)
- Disconnect Mobility Master to other Mobility Master(s)
- Connect Mobility Master to a Mobility Master
- Enable/Disable Radio
- Enter IP address to the PARI Master and the Standby PARI Master
- Multiple Radio Configuration
- Assign PARI
- Enter SARI
- Configure Air Synchronization

Changing System Name and Password

Note:

This is only applicable for a Master, never on a Slave.

The system name and password must be the same for all IPBS/IPBLs throughout the system. In order to make the changes take effect, reset the device.

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Write a system name in the System Name text field.

3. Enter a new password in the Password text field. Repeat the password.
4. Click "OK".

Note:

It is recommended to create a backup of the IPBS configuration when the password has been changed, see [Backup](#) on page 175.

Setting Subscription Method

The IP-DECT system can be set to use the following subscription methods:

- With User AC - Individual Registration and Auto Registration is possible.
- With System AC - Anonymous Registration and Individual Registration is possible.
- Disable - Registration is not possible.

Select subscription method:

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Select subscription method in the Subscriptions drop-down list.
3. Click "OK".

Note:

When "With System AC" is enabled, anyone could register to the IP-DECT System.

Configure Authentication Code

If "allow anonymous subscription" method is selected it is needed for the IP-DECT system to have an authentication code configured. The authentication code is generated automatically but can be modified manually by selecting a code consisting of 4 to 8 numbers (0-9).

1. Select DECT > System.
2. Note: To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.
3. Enter an authentication code in the Authentication Code text field.
4. Click "OK".

Select Tones

1. Select DECT > System.

Note: To access the System tab, the Master mode has to be activated, see 4.6.17

2. Select Master Mode on page 70.
3. Choose tones in the Tones drop-down list.
4. Click "OK".

Set Default Language

If the handset does not send language information to the system, this setting determine which language that is displayed for some text messages (for example hung-up and disconnected).

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Choose language in the Default Language drop-down list.
3. Click "OK".

Set Frequency Band

The IPBS/IPBL can operate in the following frequency bands:

- 1880-1900 MHz (Europe, Africa, Middle East, Australia, New Zealand, and parts of Asia)
- 1900-1906 MHz (Thailand)
- 1910-1930 MHz (South America)
- 1920-1930 MHz (North America)

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Select frequency area in the Frequency drop-down list.
3. Click "OK".

Note:

All calls will be disconnected and all handsets will temporarily lose contact with the system.

Enabling or disabling carriers

The IPBS/IPBL has 5 carriers for the North American frequency band, 4 carriers for the Thai frequency band, and 10 carriers for the other frequency bands. Under all normal circumstances all carriers should be enabled.

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. To enable carriers, select the Enabled Carriers check boxes.
3. To disable carriers, clear the Enabled Carriers check boxes.

Note:

For Brazil, select only the following carriers: 18, 19, 20, and 21.

4. Click "OK".

Enabling or disabling Local R-Key Handling

With this option enabled keypad information is handled locally. If this option is disabled keypad information is sent transparently to the IP-PBX. Local R-key handling is further described in [Appendix B: Local R-Key Handling](#) on page 213.

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. To enable, select the Local R-Key Handling check box.

Note:

To access the Local R-Key Handling check box, the SIP protocol has to be selected on the Master, see [Configure Gatekeeper](#) on page 133

3. Click "OK".

Enabling or disabling No Transfer on Hangup

If enabled, you cannot do a transfer by hanging up the handset. R4 must be pressed. See [Appendix B: Local R-Key Handling](#) on page 213.

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. To enable, select the No Transfer on Hangup check box.
3. Click "OK".

Enabling or disabling No On-Hold Display

If enabled, no On-Hold indication will be displayed in the handsets.

When one party in a call put the other party on-hold, the existing information in the other party's handset display will be replaced with an on-hold message. To prevent this the "No On-Hold Display" option must be enabled. Do as follows:

1. Select DECT > System.

Note:

NOTE: To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. To enable, select the No On-Hold Display check box.
3. Click "OK".

Enabling or disabling Display Original Called

If enabled, the original called party, instead of the diverted party, is shown to the called party if the call is diverted.

Example: Handset B is diverted to handset C which in turn is diverted to handset D. When handset A is calling handset B the following extension number or name will be shown in handset D's display depending on if the feature "Display Original Called" is enabled or not.

- Display Original Called is enabled: The extension number or name of handset B will be shown in handset D.
- Display Original Called is not enabled: The extension number or name of handset C will be shown in handset D.

Note:

In both cases the extension number or name of handset A will be shown as well.

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. To enable, select the Display Original Called check box.
3. Click "OK".

Enabling or disabling early encryption

With this option enabled the early encryption feature will be activated in the IP-DECT system.

Note: Activating early encryption will cause a restart of all RFPs.

Note: For the early encryption feature to function in the system, the DECT handset must also support early encryption.

Note: Handsets already registered will continue to function without early encryption.

Note: Only the handsets registered after enabling the early encryption feature will have support for this feature.

For more information on early encryption, see about Enhanced DECT Security in the *System Description documentation for IP-DECT*.

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. To enable, select the *Early Encryption* check box.

Note:

The *Early Encryption* check box will not be visible if the IPBS GUI is set to simplified mode. (About simplified mode, see [Simplified GUI](#) on page 71.) The *Early Encryption* check box will be disabled (greyed out) when Provisioning is enabled in the IPBS/IPBL. (About Provisioning, see [Provisioning](#) on page 107.)

3. Click "OK".

Note:

When using IPBL and the early encryption feature is enabled: The RFPs will startup only if they support this feature.

4. To view a list of DECT handsets where early encryption is in use: Select Users > Users and then click "Show". Those DECT handsets where early encryption is in use is indicated with a dot in the column *EE* (Early Encryption).

Wideband audio

Wideband audio is high definition voice quality for telephony audio. It extends the frequency range of audio signals, resulting in higher quality speech. For more information about wideband audio, see the System Description for IP-DECT.

Note:

Wideband Audio media is supported by IPBS2 only (software version 10.2.X or later). The support for Wideband Audio is also dependent on what model of handset that is used and the type of PBX that is used in the system and if handsets from other manufacturers supports the same wideband coder. For more information, see the data sheet for the handset.

To enable wideband audio, do as follows:

1. In the PARI Master, select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131

2. In the Coder drop-down list, choose either the G722.2/G711A or G722.2/G711u coder.
Depending on the support for wideband audio in the system (see the note text in the beginning of this section), then the G722.2 coder will be offered as the preferred choice which enables wideband audio. Otherwise, the G711A or G711u coder will be preferred instead. If it for some reason is necessary to disable the use of G722.2 coder in the system avoid these two coder options.
3. Enter the sample time in milliseconds in the Frame text field.

Note:

The sample time will be used only for the G711A or G711u coder.

4. Choose Exclusive enabled or disabled by selecting/clearing the Exclusive check box. The Exclusive check box will be used only for the G711A or G711u coder. If exclusive is selected for the coder the IPBS/IPBL is forced to use that coder.

Note:

When exclusive is enabled for a coder it might be impossible to make calls outside the IP-DECT system.

5. Choose Silence Compression enabled or disabled by selecting/clearing the SC check box. The Exclusive check box will be used only for the G711A or G711u coder. With Silence Compression enabled no information is sent during pauses in the conversation, this is used to save bandwidth.
6. Click "OK".

Configure Coder

Select the preferred coder, and enter the desired frame length. If exclusive is selected for the coder the IPBS/IPBL is forced to use that coder. With Silence Compression enabled no information is sent during pauses in the conversation, this is used to save bandwidth.

Note:

When exclusive is enabled for a coder it might be impossible to make calls outside the IP-DECT system.

1. Select DECT > System.

Note:

Note: To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Choose the applicable coder in the Coder drop-down list.
3. Enter the sample time in milliseconds in the Frame text field.
4. Choose Exclusive enabled or disabled by selecting/clearing the Exclusive check box.
5. Choose Silence Compression enabled or disabled by selecting/clearing the SC check box.
6. Click "OK".

Secure RTP

This option makes it possible to encrypt media streams. The encryption is activated if the SRTP is also enabled in the IP-PBX. For additional privacy, it is recommended to use the encrypted signaling protocol (SIPS) as well to hide the exchange of the SRTP keys when this is done through the signaling.

**Important:**

Configure either the RTP or SRTP option when you are using the IP-DECT solution in the Avaya Aura® SIP environment. Configuring both will result in best effort mode for SRTP and might result in call failures. For secure calls, IP-DECT supports encrypted SRTCP only. Any incoming call to IP-DECT with un-encrypted SRTCP might lead to call failures.

Note:

If SRTP is enabled, one Radio can handle maximum 5 calls for each IPBS1, 20 calls for each IPBS2 and 40 calls for each IPBL (including relayed calls) at the same time. For this reason and because of the high load on the CPU when SRTP is used, it is recommended to deactivate the Radio in the Master.

1. Select DECT > System.

Note:

To access the System tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. In the Secure RTP Key Exchange drop-down list, select what key exchange method(s) are offered and what method is selected from received offers, as follows:

Two different key exchange methods for SRTP can be selected. SDES is inside the signaling which is encrypted hop-by-hop.

- SDES (Only SDES is offered. SDES is selected, if possible.)
 - No encryption (Is set by default. No SRTP is offered. No SRTP is selected.)SDES: Only SDES is offered. SDES is selected, if possible.
3. To enable SRTP, in the Secure RTP Cipher drop-down list, select a cryptographic suite. The numbers in the list refer to key-length/sha1 hash-length.

Note:

The Secure RTP Cipher drop-down list will not be visible if “No encryption” has been selected in the Secure RTP Key Exchange drop-down list.

4. To disable SRTP, in the Secure RTP drop-down list, select the empty row at top.
5. Click "OK".

Note:

Step 6 and 7 is applies only to H.323 protocol.

6. Select DECT > Trunks.
7. In the *Password* text field, enter the same SRTP password as in the IP-PBX.
8. Click "OK".

The maximum amount of media streams are as follows depending on if SRTP is enabled or not:

- IPBS1: 20 RTP
- IPBS1: 5 SRTP
- IPBS2: 20 RTP
- IPBS2: 20 SRTP
- IPBL: 50 RTP
- IPBL: 40 SRTP

Configure Supplementary Services

The supplementary services determine how to handle a call if for example busy or not answered by the user.

1. Select DECT > Suppl. Serv.

Note:

To access the Suppl. Serv. tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Select the Enable Supplementary Services check box to activate the supplementary services below. The default Activate feature code is preset.

Explanation of feature code syntax:

\$ - Placeholder for user provided digits, e.g. a phone number

\$# - Number of digits decided by end indicator #

\$(N) – Number of digits decided by N

Example: Default feature code for Logout User is #11*\$#

Note:

To disable a specific service, select the Disable check box to the right.

3. Click "OK".
4. Reset in order to make the changes take effect, see [Reset](#) on page 190.

IP-DECT Base Station

System
Suppl. Serv.
Master
Trunks
Crypto Master
Mobility Master
Radio

☒ Enable Supplementary Services

	Activate	Deactivate	Disable
Call Forwarding Unconditional	<input type="text" value="*21*\$#"/>	<input type="text" value="#21#"/>	<input type="checkbox"/>
Call Forwarding Busy	<input type="text" value="*67*\$#"/>	<input type="text" value="#67#"/>	<input type="checkbox"/>
Call Forwarding No Reply	<input type="text" value="*61*\$#"/>	<input type="text" value="#61#"/>	<input type="checkbox"/>
Do Not Disturb	<input type="text" value="*42#"/>	<input type="text" value="#42#"/>	<input type="checkbox"/>
Call Waiting	<input type="text" value="*43#"/>	<input type="text" value="#43#"/>	<input type="checkbox"/>
Logout User	<input type="text" value="#11*\$#"/>		<input type="checkbox"/>
Clear Local Setting	<input type="text" value="*00#"/>		<input type="checkbox"/>
MWI Mode	<div style="border: 1px solid #ccc; padding: 2px;">Off</div>		
Local Clear of MWI	<input type="text" value="."/>		
External Idle Display			<input type="checkbox"/>

OK

Cancel

Select Master mode

1. Select DECT > Master.

Note:

The Master can be set to be inactive or active or for redundancy purposes, the Master can be set to act in two other ways: As Standby or Mirror.

2. In the *Mode* drop-down list, select one of the following:
 - "Off", if this IPBS/IPBL is not a Master.
 - "Active", if this IPBS/IPBL is the Master.
 - "Standby", if this IPBS/IPBL is the Standby Master.
 - "Deployment" is used for coverage test only. The speech from the handset is looped back to the handset.
 - "Mirror", if this IPBS/IPBL is the Mirror. For information about Mirror devices, see the system description for IP-DECT.
3. If you have selected the "Standby" mode, enter the primary Master IP address in its text field.
4. If you have selected the "Mirror" mode, do the following:
 - Configure NTP settings. See [Configuring the NTP settings](#) on page 100.
 - Enter the IP address to the other Mirror Master in the *Mirror Master IP address* text field.

For the Master that initially shall be the active Mirror: Click on the text link "Activate mirror". Any user and handset data in the inactive Mirror will be replaced with the user and handset data stored in the active Mirror.

To switch the active role between the Mirror Masters, click on the text link "Switch active mirror".

Note:

This should be done within a maintenance window as all active calls will be lost.

5. Click "OK".
6. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Set Master Id

1. Select DECT > Master.
2. Enter a Master id in the Master Id field. The id must be unique for each Master in a multiple Master system. The Standby Master must have the same id as the Master.
3. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Enable PARI function

Note:

This section is applicable only if SIP protocol is used.

The PARI Master is responsible for assigning PARIs, being part of the same external handover domain, to the Radios associated. A Radio will always be given the same PARI, based on the PARI-mac-address-association.

1. Select DECT > Master.
2. If this is the Pari Master or standby Pari Master, select the Enable Pari function check box.
3. Note: Only one Master per handover and sync domain can have the Pari function enabled.
4. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Configure Gatekeeper

This procedure is only applicable on the Master.

1. Select DECT > Master.
2. Set Master ID.

Note:

The ID for the Master and the Standby Master must be identical.

3. Select Protocol.

If H.323/XMobile protocol is selected, continue with Step 4 to Step 8. Otherwise, go to Step 9.

Note:

To use Avaya Aura[®] Session Manager as the SIP registrar, select SIP/UDP, SIP/TCP, or SIP/TLS as the protocol.

4. Select PBX.
5. If a redundant trunk shall be configured for connection to IPO-PBX, select the *PBX Resiliency* check box.

Note:

The *PBX Resiliency* check box will be disabled when Provisioning is enabled in the IPBS/IPBL. For more information about Provisioning, see [Provisioning](#) on page 107. *PBX Resiliency* check box is visible only if the H.323 protocol is used.

6. Enter ARS Prefix. For example, 00 for external calls.
7. Enter International CPN Prefix. For example, 0046 for Sweden.
8. Enter National CPN Prefix. For example, 031 for Gothenburg.

Note:

Step 9 and the following steps apply to the SIP/UDP, SIP/TCP, or SIP/TLS protocols.

9. In the Proxy text field, enter the IP address, domain name, or host name and optionally port of proxy (e.g. proxy1.example.com:5060) to the SIP proxy (registrar).
10. If TLS connections are used, select VoIP > SIP. For the parameter "Use Local Contact Port As Source Port For TCP/TLS Connections", select the SIPS check box.
11. Depending on how many alternative SIP proxies that are used, do as follows:
 - In the Alt. Proxy 1 text field: Enter the IP address, domain name or host name and optionally port of proxy (e.g. proxy2.example.com:5060) to the alternative SIP proxy (registrar).
 - In the Alt. Proxy 2 text field: Enter the IP address or host name and optionally port of proxy (e.g. proxy3.example.com:5060) to the alternative SIP proxy (registrar).

Note:

The Alt. Proxy 2 text field cannot be used if the Proxy and the Alt. Proxy 1 text fields contain domain names.

- In the Alt. Proxy 3 text field: Enter the IP address or host name and optionally port of proxy (e.g. proxy4.example.com:5060) to the alternative SIP proxy (registrar).Note: The Alt. Proxy 3 text field cannot be used if the Proxy and the Alt. Proxy 1 text fields contain domain names.

Note:

Unless you have a fully qualified domain name (FQDN) in your certificate when using SIPS with an alternative proxy, make sure that the parameter "No Server Certificate Subject Check For TLS Connections" under VOIP/SIP has been set to avoid connection problems with the PBX.

12. If used, enter the domain address in the Domain text field.
13. Enter the maximum internal number length in the Max. internal number length text field.
14. To handle calls of international format: Depending on the type of IP-PBX and handsets that are used in the IP-DECT system, it can be necessary to enter an international CPN prefix in the device. Do as follows:
 - In the International CPN Prefix text field, enter the international CPN prefix for the country in which the device is used.

Following will happen: When the IP-DECT system is receiving a call of international number format, the device will convert the plus sign (+) to the international CPN prefix that has been entered in the International CPN Prefix text field. The international CPN prefix will be shown in the handset display of the called party and when the called party calls back, the international CPN prefix will be used.

15. To use the system password for registration, select the Registration with system password check box.

In a system with many users where the same password shall be used for all users, it is possible to use the system password for registration towards the gatekeeper. About how to set the system password, see [Changing System Name and Password](#) on page 122.

Note:

When changing the system password you also need to change the password in all Radios and all other Masters, Pari Masters including standby devices. After this you need to restart all the devices where you made changes (i.e. probably the whole system).

16. To enable "Enbloc Dialing", select the Enbloc Dialing check box.

With this option enabled the keystrokes on the handsets are buffered in the device for a short period of time before sent to the IP-PBX (use this when the IP-PBX does not support overlap sending). If disabled the keystrokes are immediately sent to the IP-PBX.

17. To enable enblocsend-key, select the Enable Enbloc Send-Key check box.

If enabled, the #-key can be used as enbloc send-key to speed up dialing when digits are sent one by one from the phone.

Note:

If Enbloc Send-Key is enabled, it is not possible to dial numbers that include a #-key.

18. To enable DTMF through RTP Channel, select the Allow DTMF through RTP channel check box

If enabled, DTMF is negotiated according to RFC2833/4733, resulting in DTMF digits being sent as RTP payload directly to the other endpoint. If the other party does not support RFC2833/4733, there will be fall back to DTMF over the signaling channel (SIP INFO or H.245).

If disabled, the DTMF is always sent in the signaling channel.

19. To enable short disconnect tone, select the Short Disconnect Tone check box.

With this option enabled, a short tone (i.e. busy tone) is received when the other party hangs up. If this option is not enabled, busy tones will be received for a longer period of time.

20. To determine how calls that are rejected by the user should be handled: Select "Busy", "Rejected", or "No user responding" in the Treat rejected calls as drop-down list.
21. If in step 5, you selected "SIP" protocol, enable or disable the following options in the SIP Interoperability Settings section:

- Registration time-to-live

This is the Expires-header in the REGISTER message. The default is 120 seconds.

To enable this option, enter a value specified in seconds in the "Registration time-to-live" field. Note: Depending on the number of users, the entered value may have to be increased. For example, for 500 users it is recommended to enter 300 seconds and for 1000 users it is recommended to enter 600 seconds. The SIP proxy might respond to the REGISTER with a different value. Then the responded value will be used for REGISTER refresh.

When secondary SIP proxy is in use, for example when the primary SIP proxy is down, the configured time-to-live value is used to decide how often the Master will try to reconnect to the primary SIP proxy.

- STUN

If the SIP server is outside the private network and a STUN server is used for NAT traversal, enter the STUN server address in one of the following formats:

- A DNS name (a domain or a fully qualified domain name (FQDN)) and an optional port (for example, `stun.example.com:1234`)

When a domain is used, a DNS SRV lookup is made to discover up to two STUN servers.

- an IP address and an optional port. If an IP address is used, an alternative address can be specified for each server, separated by a comma (for example, `172.16.13.1:1234, 172.16.13.2`)



Important:

In the Avaya Aura[®] SIP environment, STUN is not supported. Therefore, do not enable this option when you are configuring Avaya Aura[®] Session Manager as the SIP registrar.

- Hold Signaling

Some IP-PBXs require special way of hold signaling. In the "Hold Signaling" list field, select one of the following:

- inactive: No media stream is sent or received.
- send only: Media stream is sent only and not received.
- send only with 0.0.0.0: Special case of send only where also the media IP address is set to 0.0.0.0.

- Hold before Transfer

If this option is enabled, the consultation call is put on hold before transfer. Some IP-PBXs require this option so that both called parties are put on hold before the transfer is carried out.

To enable this option, select the "Hold before Transfer" check box.

- Accept Inbound Calls not Routed via Home Proxy

If this option is enabled it could be possible for inbound calls to bypass call restrictions configured in the IP-PBX. If it is disabled a 305 Use Proxy response will be sent.

To enable this option, select the "Accept inbound calls not routed via home proxy" check box.

- Register with number

If this option is enabled, number will be used for registrations towards the IP-PBX instead of name. Name will be used for authentication. To enable this option, select the "Register with number" check box.

- AOR as Line Identity

If this option is enabled, the SIP address-of-record (AOR) is used as the line identity instead of Number.

- KPML support

If this option is enabled, the DTMF digits are sent with the SIP signaling using the Keypad Markup Language (KPML) method. With this method single DTMF digits can also be sent during call setup to add digits to the callend number (overlap sending). Enbloc dialing can then be unchecked. The IP-PBX must also support KPML.

To enable this option, select the KPML support check box.

Make sure that the Allow DTMF through RTP and the Send inband DTMF check boxes are cleared..

22. Click "OK".
23. Reset in order to make the changes take effect.
24. If in step 2, you selected the "SIPS" protocol, the IPBS downloads a certificate from the IP-PBX to ensure a secure transaction. The IPBS does not initially trust the certificate so it must be added manually to the trust list of the IPBS. It is also possible that more than one certificate is downloaded creating a certificate chain. The root CA certificate is at the end of the chain which contains a self-signed signature and it is able to approve other certificate requests. It is recommended to add the root CA certificate to the IPBS trust list.

Registration for Anonymous Devices

Handsets registered anonymously can make emergency calls through an extension reserved for anonymous users



Important:

In Avaya Aura® SIP environment, Registration for Anonymous Devices is not supported.

Note:

Call restrictions must be configured in the PBX to allow for emergency calls only. This option also provides a solution for the case when the Master, running on an IPBS with local power, loses IP connectivity without the local host Radio losing its connection to the Master. The handsets locked to this Radio become isolated from the system without any notification.

1. Select DECT > Master.
2. Enter the registration name and number to the PBX in the Registration Name /Number text fields.
3. Select the "Deactivate Master if no connection" check box to make the Master deactivate itself if the anonymous registration to the PBX fails. As a result the local host Radio will fail to register to the Master, and handsets, depending on their type, can move to another Radio that is operable.

Note:

It is not recommended to use this option for a Master without a Standby Master.

4. Click "OK".

Note:

A simpler and reliable way to handle this case is to deactivate the local host Radio on the Master.

Select Crypto Master Mode

Note:

This section is applicable only if SIP protocol is used.

In a system with Mobility Master(s), a Crypto Master must be configured to enable the early encryption feature.

1. Select DECT > Crypto Master.
2. Select "Active" in the Mode drop-down list.
3. Write a login name in the Name text field.
4. Enter a password in the Password text field.
5. Click "OK".
6. Connect Mobility Master(s) to the Crypto Master, see [Connect Mobility Master to a Crypto Master](#) on page 140

Select Mobility Master Mode

Note:

This section is applicable only if SIP protocol is used.

In a system with two or more Masters (Multiple Master system), a Mobility Master must be configured. For more information on Multiple Master Systems, see the System Planning documentation for IP-DECT.

1. Select DECT > Mobility Master.
2. Select in the Mode drop-down list:
 - "Active", if this device is the Mobility Master.
 - "Standby", if this device is the Standby Mobility Master.
3. If you have selected the "Standby" mode: Enter the primary Mobility Master IP address in its text field.
4. Write a login name in the Name text field.
5. Enter a password in the Password text field.
6. Click "OK".

Connect Mobility Master to other Mobility Master(s)

Note:

This section is applicable only if SIP protocol is used.

1. Select DECT > Mobility Master.
2. In the Other Mobility Masters section: Enter a name in the Name text field.
3. Enter a password in the Password text field.
4. Enter the address to the other Mobility Master in the IP Address text field.
5. Enter the address to the Standby Mobility Master for the other Mobility Master in the Alt. IP Address text field.
6. Click "OK".
7. Repeat the above steps to connect to additional Mobility Masters.

Disconnect Mobility Master from other Mobility Master(s)

Note:

This section is applicable only if SIP protocol is used.

1. Select DECT > Mobility Master.
2. Delete the name in the Name text field.
3. Delete the password in the Password text field.
4. Delete the address to the other Mobility Master in the IP Address text field.
5. Delete the address to the Standby Mobility Master for the other Mobility Master in the Alt. IP Address text field.

6. Click "OK".
7. Repeat the above steps to disconnect from additional Mobility Masters.

Note:

When disconnecting from other Mobility Master(s) the password field might have to be reentered.

Connect Mobility Master to a Crypto Master

Note:

This section is applicable only if SIP protocol is used.

In a system with Mobility Master(s), all Mobility Master(s) must be connected to a Crypto Master to enable the early encryption feature.

For information on how to configure a Crypto Master, see [Select Crypto Master Mode](#) on page 138.

1. Select DECT > Mobility Master.
2. In the Crypto Master section: Enter the name for the Crypto Master in the Name text field.
3. Enter the password for the Crypto Master in the Password text field.
4. Enter the address to the Crypto Master in the IP Address text field.
5. Click "OK".
6. Repeat the above steps to connect additional Mobility Masters to the Crypto Master.
7. To view a list of Mobility Masters connected to the Crypto Master: Select Device Overview > Crypto Master. The Mobility Masters sync status is shown in the list with a green, yellow or red dot in the column Sync. Green dot means that the Mobility Master is connected to the Crypto Master. Yellow dot means that the Mobility Master is disconnected from the Crypto Master. Red dot means that the Mobility Master must connect to the Crypto Master before the Crypto Master is operable.

Connect Master to a Mobility Master

Note:

This section is applicable only if SIP protocol is used.

In a system with several Masters, all Masters must be connected to the Mobility Master.

1. Select DECT > Master.
2. Enter the name for the Mobility Master in the Name text field.
3. Enter the password for the Mobility Master in the Password text field.
4. Enter the address to the Mobility Master in the IP Address text field.
5. Enter the address to the Standby Mobility Master in the Alt. IP Address text field.

6. Click "OK".
7. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Note:

This section is applicable only if SIP protocol is used.

Entering admin password

1. Select **DECT > System**.
2. Enter password.

Note:

Create a backup of the IPBS/IPBL configuration when you change the administrator password. See [Backup](#) on page 175.

Configuring Master ID

Only applicable on the Master and standby Master.

You only need the Master ID configuration in a Multi Base Station Master scenario. For a single IPBS/IPBL Master, use Master ID 0.

In a Multi Base Station Master scenario, configure an individual Master ID for each IPBS/IPBL Master in the range of 0 and 250. Use Master ID "0" for IPBS/IPBL Master1, which is the LDAP server of the IP-DECT system. All further IPBS/IPBL Masters doing the LDAP replication should use a Master ID from 1 to 250.

A standby Master must use the same Master ID as the corresponding IPBS/IPBL Master.

Configuring IP-PBX

Only applicable on the Master.

1. Select **DECT > Master**.
2. Select PBX.
3. Enter the ARS Prefix, for example, 00 for calling outside the building.
4. Enter the International CPN Prefix, for example, 0046 for Sweden.
5. Enter the National CPN Prefix, for example, 031 for Göteborg.

Configure Trunks (applies only to H.323 protocol)

Note:

Trunks cannot be configured (configuration sets will be grayed out) in the IPBS/IPBL when Provisioning is used with IP-PBX. However, it will still be possible to activate a primary trunk manually. See [Activation of Primary Trunks](#) on page 144. For information about Provisioning, see [Provisioning](#) on page 107.

A shared trunk is used for connection between the IP-DECT system and an PBX which can be an ACM PBX or an IP-PBX.

There are two kinds of trunks; primary and redundant. One or more primary trunks can be configured. They are used in the first place. One or more redundant trunks can also be configured. They are only used if none of the primary trunks are in "Active" mode. That is, all primary trunks must be in "Down" mode.

Note:

Only one primary and one redundant trunk can be configured for the IP-PBX.

To configure primary and redundant trunks, do as follows:

1. Select DECT > Trunks.
2. To determine the status of the trunks towards the IP-PBX, enter in the *Period (sec) field* how often the IPBS/IPBL shall send status inquiry messages to the IP-PBX.
3. Enter the IP Address of the IP-PBX in the CS IP Address field and the port of the IP-PBX in the CS Port field.
4. Enter port address of the IPBS in the Local Port field.
5. If a redundant trunk shall be configured for connection to the IP-PBX, make sure that the *PBX Resiliency* check box has been selected (DECT > Master).

Note:

The *PBX Resiliency* check box will be disabled when Provisioning is enabled in the IPBS/IPBL. For information about Provisioning, see [Provisioning](#) on page 107.

Load Balancing

Note:

This section does not apply for the IPO PBX.

There are possibilities to configure several primary trunks to get a good load balancing in the system. This means that call setups alternate between the active primary trunks. The first active primary trunk has the highest priority.

If no load balancing is desired in the network, only one primary trunk should be configured and all calls are set up on this trunk if it is in "Active" mode.

Trunk Modes

There are four different modes for a primary and redundant trunk.

Note:

A primary trunk can never be set to Standby.

Active	The trunk is up and accepts traffic.
Up	The trunk is up but does not accept traffic as it is not set to "Active" mode.
Down	The trunk is down and not working.
Standby	The trunk is ready to be used for redundant purpose.

A trunk that is "Active" or "Up" is correctly configured and correctly attached. A trunk that is "Down" has a fault. Either in the configuration or the hardware (broken cable). Fault finding can be to check that the IP-address is correct as well as to check the PCB and the cable.

Redundant Trunks

Commonly one redundant trunk is configured as a backup. It is used if all of the primary trunks are down.

If all primary trunks are "Down", the redundant trunks starts working. The redundant trunk will get the status "Active" or "Down" depending if it works or not. If it gets the status "Active" the calls will go through the redundant trunk until the primary trunks are activated again.

Activation of Primary Trunks

There are two ways of activating the primary trunk; Manual and Automatic:

- **Manual**

Click the "Activate Primary Trunks" button. (This button is only available if there is any primary trunk in the "Up" mode.)

The primary trunks then enters "Active" mode and the redundant trunks cease to be active and go to "Standby" mode". (New calls go through the primary trunks and ongoing calls go through the redundant trunks until the call is finished).

- **Automatic**

Note:

Automatic activation cannot be configured if Provisioning is used. About Provisioning, see [Provisioning](#) on page 107.

1	Select the "Primary trunks prioritized" check box.
2	<p>Set the "Supervision Timeout" to the desired time. The primary trunks are automatically changing from the "Up" mode to the "Active" mode when the timer is elapsed.</p> <p>Example: If the timeout is set to 600 seconds, it means that the system waits 600 seconds (10 minutes) until it is automatically up and running again (on active primary trunks). This is the amount of time to fix any problems.</p> <p>During the Supervision Timeout, there is a continuous condition check of the trunk connection. The timer states the time it must take until a successful connection is established in the system.</p>

Enable or disable the radio

If the IPBS/IPBL shall not be used as a radio, for example only be used as a Master, it can be disabled by marking the Disable check box.

**Tip:**

To assign a Master, see [Enter IP Address to PARI Master and the Standby Master](#) on page 145.

- Select DECT > Radio.
- Clear the Disable check box.
- Reset in order to make the changes take effect, see [Reset](#) on page 190.

Enter IP Address to PARI Master and the Standby Master

All IPBS/IPBL need to know the IP address of the Master and the Standby Master.

1. Select DECT > Radio.
2. Enter the name for the Master in the Name text field.
3. Enter the password for the Master in the Password text field.
4. Enter the address to the Master in the Master IP Address text field. If this is the Master, enter 127.0.0.1.
Note: The Master can be configured as Active or Mirror.
5. Enter the address to the Standby Master in the Alt. Master IP Address text field. If this is the Standby Master, enter 127.0.0.1.
Note: The Standby Master can be configured as Standby or Mirror.
6. Click "OK".
7. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Multiple Radio Configuration

The Master can configure the same Radio settings for all Radios in the system. All settings configured in the Radio Config page replace the local Radio settings. This means that all settings in the Radio Config menu will have precedence over values configured locally or received via DHCP options.

1. Select DECT > Radio Config.
2. Configure alarm and event forwarding, see [Forward Alarms and Events](#) on page 156.
3. Configure automatic firmware update, see [Configure Automatic Firmware Update](#) on page 154.
4. Configure NTP settings, see [Configuring the NTP settings](#) on page 100.
5. Configure IP settings, see [Configuring IP4 settings](#) on page 116.
6. Click "OK".

Assign PARI

The PARI is a part of the broadcast identity, which uniquely identifies an IPBS/IPBL. This PARI is automatically assigned to each IPBS/IPBL in the system. But if more than one Avaya IP-DECT system operates within the same coverage area, the systems need to have a unique system identity in the PARI assigned in order to differentiate the systems.

To see the occupied system IDs of other Avaya IP-DECT systems within the coverage area, perform an RFP scan, see [RFP Scan](#) on page 190.

1. Select DECT > PARI.
2. Select a number between 1 and 292. If this is not done, the IPBS/IPBL will randomly select a number.

Note:

The number of system IDs will affect how many IPBSs/IPBLs that can be used per Master in an installation, as shown below:

System ID = 1 to 36:

Max. 1023 IPBS per Master or max. 240 IPBL per Master.

System ID = 37 to 292:

Max. 127 IPBS per Master or max. 127 IPBL per Master.

3. Click "OK".
4. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Enter SARI

The SARI is the broadcast identity, which uniquely identifies an IP-DECT system. The SARI is added in the Master.

1. Select DECT > SARI.
2. Enter the license number delivered by your supplier in the SARI text field.
3. Click "OK".
4. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Configure Air Synchronization

This section only applies to the IPBS.

IPBS System

The IPBSs use the DECT air interface to synchronize to each other. For an individual IPBS it is not needed to configure which IPBS to synchronize to. It is needed to manually select one or several IPBS as synchronization master candidate. The Master assigns one of these IPBS as an active sync master. The remaining candidates will act as sync slaves and can be new sync masters in case the active sync master will fail/break. When using one sync region it is recommended to configure at least two base stations in the middle of the building as synchronization masters.

All IPBSs in sync slave mode sends its list over received sync candidates to the Master. The Master informs the IPBS sync slaves which sync candidate it shall synchronize to.

Mixed System

All IPBLs are synchronization masters in region 0. Any IPBS in this region will receive its synchronization over the air from the RFPs, which are connected to the IPBL.

Sync Regions

Sync regions are used when, for example, several buildings are located in the same coverage area and all radios are using same Master but where the synchronization coverage between buildings is not good enough for a stable synchronization.

A solution may be to use separate synchronization regions for the buildings and have reference synchronization between the regions. Each region has its own Sync Master but can take reference sync from another region and handover between the buildings is possible. If a region should lose the reference synchronization with another region, the internal synchronization in respective region will still work but there can be no handover between the regions.

Note:

For the synchronization to work, it is not allowed to configure reference sync in a ring.

Configure Sync Slave IPBS

All IPBSs in sync slave mode sends its list of sync candidates to the Master. The Masters informs the IPBS sync slave which sync candidate it shall synchronize to.

In addition to the above automatic synchronization procedure it is also possible to use static synchronization, that is, manually lock on to a specific RFPI. When specifying a specific RFPI, it must be within the same synchronization region.

Configure Sync Slave as follows:

1. Select DECT > Air Sync.
2. Select "Slave" in the Sync Mode drop-down list.
3. To lock the sync slave to a specific RFPI, enter the sync RFPI in the Sync RFPI text field. Enter an alternative sync RFPI in the Alternative Sync RFPI text field (optional).
4. In the Sync Region text field, enter a region ID between 0 and 249.

5. Click "OK".

Configure Restricted Slave IPBS

The restricted slave mode gives the possibility to disable air synchronization sources that are not reliable. IPBSs configured in restricted slave mode cannot be used as a synchronization source so they can only retrieve synchronization from other radios.

Configure restricted slave mode as follows:

1. Select DECT > Air Sync.
2. Select "Restricted Slave" in the Sync Mode drop-down list.
3. To lock the restricted slave to a specific RFPI, enter the sync RFPI in the Sync RFPI text field. Enter an alternative sync RFPI in the Alternative Sync RFPI text field (optional).
4. Enter a region ID between 0 and 249 in the Sync Region text field.
5. Click "OK".

Configure Sync Master IPBS

Radios configured as sync master will report to the Master that it wants to be a sync master. The Master will select one of them to be the active sync master.

When a sync master has been assigned to be active it searches for other IPBSs within the same region during 30 seconds. If any IPBS is found the values for slot, frame, multi frame and PSCN are received and applied to the Sync Master. After receiving all these values or after the time-out of 30 seconds the Sync Master enters the master state.

With this method it will be possible to restart only the Master in the region. The remaining slaves will be able to maintain synchronization for a few minutes during restart of the Master. The Master will adjust itself to the other IPBSs at startup. The slaves will notice that the Master is back and the synchronization will be received from the Master.

In master state the values are updated locally during all further operation of the Master IPBS and no synchronization to other IPBSs in the same region is done.

It is possible to configure the Sync Master to synchronize to a reference base station (another or same DECT system). In this case the Sync Master will try to synchronize to the reference system if the reference system is found but it will not require the reference system to be available. The Sync Master will operate even though the reference system is not available. During startup the Master will prefer to synchronize to a slave base in the same system before synchronizing to the reference base station.

Configure Sync Master as follows:

1. Select DECT > Air Sync.
2. Select "Master" in the Sync Mode drop-down list.
3. To synchronize the sync master to a reference base station, enter the reference base station in the Reference RFPI text field. Enter an alternative reference base station in the Alternative reference RFPI text field (optional).

4. In the Sync Region text field, enter a region ID between 0 and 249.
5. Select type of resynchronization action to perform at reference sync failure, a manual or an automatic (scheduled) one.
6. Select Action at reference sync failure as one of the following:
 - Resynchronize on command (manually)
 - Resynchronize every day (automatically)
 - Resynchronize once per week (automatically)
7. If automatic resynchronization is selected, the master will restart the synchronization at the scheduled time if the synchronization to the reference system is lost. If manual resynchronization is selected, the administrator can manually restart the synchronization to the reference system if required.
8. Click "OK".

VoIP

This section only applies if the SIP protocol is used in the system.

Add instance id to the user registration with the IP-PBX

This might simplify administration with some IP-PBXs.

1. Select VoIP > SIP.
2. To enable, select the "Add instance id to the user registration with the IP-PBX" check box corresponding to the SIP protocol that is used.
3. Click "OK".

IP-PBX supports redirection of registration when registered to alternative proxy

When the primary proxy is down and an alternative proxy is in use, the IP-PBX will redirect the registration to the primary proxy when available again.



Important:

IP-DECT does not make any attempts to contact the primary proxy as long as the alternative proxy is available. If you want to redirect the registration to the primary proxy again, you must manually disable the redirection configuration by clearing the "IP-PBX supports redirection of registration when registered to alternative proxy" check box".

1. Select VoIP > SIP.

2. To enable, select the "IP-PBX supports redirection of registration when registered to alternative proxy" check box corresponding to the SIP protocol that is used.

Note:

This configuration is disabled by default.

3. Click "OK".

Use local contact port as source port for TCP and TLS connections

Instead of having a dynamic/ephemeral source port for the persistent TCP/TLS connection, the local contact port of the corresponding phone can be used instead (required by some IP-PBXs.).

1. Select VoIP > SIP.
2. Select the SIPS check box.
3. Click "OK".

Prefer P-Asserted-Identity As Calling Party Identity

Enable this option if the P-Asserted-Identity-header is preferred instead of the From-header as calling party identity, received in the INVITE message.

1. Select VoIP > SIP.
2. To enable, select the "Prefer P-Asserted-Identity As Calling Party Identity" check box corresponding to the SIP protocol that is used.
3. Click "OK".

Use SBC for NAT traversal

If a Session Border Controller (SBC) is used which handles NAT traversal between IP-DECT and the IP-PBX, it might be needed to enable this option. By enabling this option the Contact address will not be updated with the external address when NAT is detected by IP-DECT.

1. Select VoIP > SIP.
2. To enable, select the "Use SBC for NAT traversal" check box corresponding to the SIP protocol that is used.
3. Click "OK".

No Server Certificate Subject Check For TLS Connections

Normally the server certificate subject (CN/SAN) will be checked against what has been configured in IP-DECT. If there is no match, the TLS connection will fail. By selecting this option the check will not be made.

1. Select VoIP > SIP.
2. To enable, select the "No Server Certificate Subject Check For TLS Connections" check box corresponding to the SIP protocol that is used.
3. Click "OK".

Accept Hold Signaling Using Remote Media Address 0.0.0.0

This option is used when a media re-negotiation returns a remote media address 'c=IN IP4 0.0.0.0' and the purpose is to put the local handset on hold without media, but the media attribute 'a=inactive' is not used.

1. Select VoIP > SIP.
2. To enable, select the "Accept Hold Signaling Using Remote Media Address 0.0.0.0" check box corresponding to the SIP protocol that is used.
3. Click "OK".

Remove SRTP Lifetime in SDP

This option is used to disable SRTP crypto key lifetime in SDP. The purpose is to make the SRTP negotiation compatible with PBXs that does not support SRTP crypto key lifetime in SDP (e.g. Cisco UCM).

1. Select VoIP > SIP.
2. To enable, select the "Remove SRTP Lifetime in SDP" check box corresponding to the SIP protocol that is used.
3. Click "OK".

Allow Multiple Codecs in Answer SDP

If a received SDP answer includes multiple voice codec choices, a re-negotiation is started to pinpoint the preferred codec and avoid potential asymmetric media problems. By selecting this option the re-negotiation will not be made.

1. Select VoIP > SIP.
2. To enable, select the "Allow Multiple Codecs in Answer SDP" check box corresponding to the SIP protocol that is used.
3. Click "OK".

Configure Echo Canceller

This section describes the echo canceller settings for IPBS2.

If DECT handsets are used in noisy environments, gaps in the voice may appear that are caused by the echo canceller. A noise optimised echo canceller mode can be used in this case.

1. Select VoIP > Media.
2. Select "Enhanced EC" from the *EC Type* drop-down list if handsets are used in a noisy environment.
3. Click "OK".

UNITE

Configure Messaging

If an AIWS2 is to be used in the IP-DECT system, enter the IP address following the steps below.

1. Select UNITE > SMS.

Note:

To access the SMS tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Click "OK".
3. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Configure Network Regions

It is possible to setup several Network Regions by configuring one Master Base Station for each Network Region.

Each Master Base Station is identified towards the AIWS2 by a unique number. The AIWS2 is supporting 100 Network Regions. It is recommended to set a number between 1 and 100.

1. Select UNITE > SMS.

Note:

To access the SMS tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Enter a number identifying the Network Region in the Region ID field.
3. Click "OK".

Device Management

If a specific Device Manager (for example AIWS2) is to be used in the IP-DECT system, enter the IP address to the Device Manager following the steps below. To set the device to search for an existing Device Manager on the network, go to [Service Discovery](#) on page 153.

Note:

To access the Device Management tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

For Portable Devices, do as follows:

1. Select UNITE > Device Management.
2. In the *Portable Devices* section: Enter the address to the Device Manager in the IP Address text field.

The IP address for the Device Manager that the Master is currently connected to is shown under Active Settings.

3. Click "OK".

For IP-DECT Devices, do as follows:

1. Select UNITE > Device Management.
2. In the *IP-DECT Devices* section, enter the address to the Device Manager in the IP Address text field.

Note:

The IP-DECT Devices section is accessible only for PARI Master and for devices where the Radio is not activated.

The IP address for the Device Manager that the Master is currently connected to is shown in the Unite Address text field under Active Settings.

3. Enter the Resource Identity/Service in the Resource Identity text field. The default is IPDECT.
4. Click "OK".

Service Discovery

If no Device Manager (for example AIWS2) has been selected to be used in the IP-DECT system, see [Device Management](#) on page 153, then the Master will automatically search for an existing Device Manager on the network. To set the Master to search in a specific domain on the network or to stop the search, follow the steps below.

1. Select UNITE > Service Discovery.

Note:

To access the Service Discovery tab, the Master mode has to be activated, see [Select Master mode](#) on page 131.

2. Do one of the following:
 - To stop the Master to search for a Device Manager, select the Disable check box.
 - To set the Master to search for a Device Manager in a specific domain on the network, enter the domain id in the Domain ID text field. The domain id must be the same as the one entered in the Device Manager.
3. Click "OK".

When the Master is connected to a Device Manager, the IP address for the Device Manager is shown in the Unite Address text field under UNITE > Device Management.

Send Status Log

It is possible to send alarm and event reports to the Unite system. For example directly to the ESS fault handler or to the UNA (Unite Node Assistant) which in turn forwards the alarm event according to distribution lists.

1. Select UNITE > Status Log.
2. Enter the address to the server where the Status Log should be sent in the Unite IP Address text field.
3. Enter the Resource Identity/Service in the Unite Resource Identity text field. If this field is left empty then the default will be UNA (Unite Node Assistant).

Services

Configure Automatic Firmware Update

The IPBS/IPBL can be configured to automatically update its firmware. A script file must be uploaded to a suitable directory on an internal web server. For information on the script file syntax, see [Appendix A: How to Configure and Use the Update Server](#) on page 203.

1. Select Services > Update.
2. Enter the URL of the script file in the URL text field.
3. Enter the poll interval, in minutes, in the Interval (min) text field
4. Click "OK".

The Current Update Serials section shows the values of the variables set after the last execution of the associated command.

Configure Logging

There are three ways to collect logs, see the table below.

TCP	The syslog entries are transmitted using a TCP connection.
SYSLOG	The entries are reported to a “syslogd” server in the network, which is responsible for further evaluation or storage of the entries.
HTTP	The syslog entries are transferred to a web server where they can be further processed. Each individual syslog entry is transmitted as form data to the web server in HTTP GET format.
HTTPS	The syslog entries are transferred to a web server where they can be further processed. Each individual syslog entry is transmitted as form data to the web server in HTTPS GET format.

Store the Syslog Entries using a TCP Connection

1. Select Services > Logging
2. Select "TCP" in the Type drop-down list.
3. Enter the "IP address" of the logging server in the Address text field.
4. Enter the "Port" of the logging server in the Port text field.
5. Click "OK".

Store the Syslog Entries in a Syslogd

1. Select Services > Logging.
2. Select “SYSLOG” in the *Type* drop-down list.
3. Enter the “IP address” of the syslogd in the *Address* text field.
4. Enter the desired syslogd message class in the *Class* text field.
5. Click “OK”.

Store the Syslog Entries on a Web Server

1. Select Services > Logging.
2. Select “HTTP” or “HTTPS” in the *Type* drop-down list.
3. Enter the IP address in the *IP Address* text field.
4. Enter the port in the *Port* text field.
5. Enter the relative URL of the form program on your web server in the *Path* text field.

6. Click "OK".

Note:

The IPBS/IPBL will make an *HTTP GET* request or *HTTPS GET* request to the web server on the registered URL followed by the URL-encoded log entry.

Example:

Enter the value "/cdr/ cdrwrite.asp" in the "URL-Path" field if a page is on the web server with the name "/cdr/cdrwrite.asp" with a form that expects the log message in the "msg" parameter. In this example, the IPBS/IPBL will make a *GET /cdr/cdrwrite.asp?event=syslog&msg=logmsg* request to the server.

Forward Alarms and Events

It is possible to forward alarms and events to a HTTP server destination. Typically this can be a Master base station. This programming can be done in the Master (DECT > Radio config) or locally as described below.

1. Select Services > Logging.
2. If the HTTP server destination requires HTTPS then select "HTTPS" in the Type drop-down list.
3. Enter the IP Address of the IPBS/IPBL where you want to have an overview of all faults in the External HTTP Server Address text field.
4. Enter the HTTP server port in the External HTTP Server Port text field. The default value is 80.

Configure HTTP settings

Traditionally IPBS/IPBL has been administered over the network via the http protocol (default port 80).

In a secure system (see the IP Security chapter) IPBS/IPBL should be administered via the https protocol (default port 443). If for some reason port 443 is not to be used, you can use another port for the local https server and then access the IPBS/IPBL via this port.

Http and https traffic, respectively, would be disabled if their port values were to be set to zero (0). Therefore:

- To disable http traffic set "Port" to 0 (which is recommended in a secure system). Attempts to contact the device using the http protocol will result in an Unable to connect message.
- To disable https traffic set "HTTPS Port" to 0 (not recommended).

Any other port values would enable http and https traffic, respectively, for the port specified.

The screenshot shows the 'IP-DECT Base Station' configuration window. The 'HTTP' tab is selected in the top navigation bar. On the left, a sidebar lists various configuration categories. The main content area is divided into sections for general HTTP settings, allowed stations, and active sessions. The 'General' section includes checkboxes for 'Force HTTPS', 'Disable HTTP basic authentication', and 'Password protect all HTTP pages', along with input fields for 'Port' (set to 80) and 'HTTPS-Port' (set to 443). The 'Allowed Stations' section has 'Address' and 'Mask' input fields. The 'Active HTTP sessions' section contains a table with columns for 'From', 'Protocol', 'To', 'Uptime', and 'Idle Requests', showing a single entry for an HTTPS session from 172.20.14.122 to /HTTP0/mod_cmd.xml.

Figure 7. Configure the HTTP Settings

1. Select Services > HTTP

- Select the Force HTTPS check box to allow only HTTPS sessions and all HTTP requests are redirected as HTTPS requests.
- Select the Disable HTTP basic authentication check box to require all administrative and programmatic clients to support HTTP digest authentication.
- Select the Password protect all HTTP pages check box to password protect all HTTP pages.
- Select the *Mutual TLS (MTLS)* check box to enable mutual TLS for client certificate authentication.



Important:

A trusted client certificate with the associated private key must be installed in the web browser's certificate store. See [Appendix E: Import Client Certificate in the Web Browser](#) on page 223. The trusted client certificate or the CA certificate that signed the client certificate must also be added to the trust list in the device. See [Trust List](#) on page 102. If the correct certificate is not available, and mutual TLS authentication is enabled, it is not possible to access the device in any other way.

- Select the *No Cache* check box to request the web browser not to store any data in the cache. Selected by default.
- Enter "Port number" in the Port text field. The device is by default administered over the network via the TCP port 80 (http). If port 80 is not to be used another port can be set up for access. Set this value to 0 to disable http traffic (recommended). Attempts to contact the device using the http protocol will result in an Unable to connect message.
- Enter "HTTPS Port" in the HTTPS Port text field. To access the device securely, use the TCP port 443 (https). Set this value to anything except zero (0) to enable https traffic. The default value is 443. The value zero (0) disables https traffic which is not recommended.
- Enter "Network Base Address" / "Network Base Mask" in the Allowed stations text fields to only allow access only from matching network, for example: 172.16.0.0 / 255.255.0.0

- In the Active HTTP sessions field all ongoing HTTP traffic is displayed.
2. Click "OK".

Configure the HTTP Client settings

A list of URL that require authentication can be specified.

1. Select Services > HTTP Client.
2. Enter the "URL" in the *URL* text field.
3. Enter "User" and "Password" in the *User* and Password text fields.
4. Click "OK".

A new row will be shown and more URLs can be added.

SNMP

Faults can be reported in the IP-DECT system via the Simple Network Management Protocol (SNMP). The SNMP framework has three parts:

- An SNMP manager: the system used to control and monitor the activities of network hosts using SNMP.
- An SNMP agent: the software component within the managed device that maintains data for the device and reports data, as needed, to managing systems.
- A MIB: The Management Information Base (MIB) is a virtual information storage area for network management information.

The agent and MIB reside on a network device (for example, router, access server, or switch). To enable the SNMP agent on the IPBS/IPBL, the relationship between the manager and the agent must be defined.

The screenshot shows the 'IP-DECT Base Station' configuration window. On the left is a sidebar with a 'Configuration' section containing tabs for General, LAN, IP, LDAP, DECT, VoIP, Unite, and Services. Below this is an 'Administration' section with tabs for Users, Device Overview, DECT Sync, and Traffic. The 'Services' tab is selected, and within it, the 'SNMP' sub-tab is active. The main area contains the following fields and controls:

- Community:** A text box containing 'public'.
- Device Name:** A text box containing 'Building_A_Master_1'.
- Contact:** An empty text box.
- Location:** A text box containing 'Building A'.
- Authentication Trap:** A checkbox that is currently unchecked.
- Trap Destinations:** A large empty text area.
- Allowed networks:** A section with two sub-fields:
 - Address:** An empty text box.
 - Mask:** An empty text box.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom.

Figure 8. Configure SNMP Settings

1. Select Services > SNMP
2. Enter a name in the Community field if you are not using the standard community name (public). The community text string acts like a password to regulate access to the agent on the Base Station.
3. Enter a device name in the Device Name field. This field is optional and serves only informational purposes.
4. Enter the name and phone number of the contact person in the Contact field. This field is optional and serves only informational purposes.
5. Enter a location in the Location field. This field is optional and serves only informational purposes.
6. Select the Authentication Trap check box to enable the sending of authentication traps. Access via SNMP is only possible if the correct Community Name is entered. If enabled a trap will be generated in the event of access with an incorrect Community Name.
7. Enter the IP address of the desired trap destinations in the Trap Destinations field. SNMP traps will be sent to all destinations.
8. Enter the IP address and mask of the networks that are allowed to send SNMP requests. All networks are allowed if the field is empty.
9. Click "OK".

Phonebook

Note:

This section applies only when using IP-PBX.

Central phonebook is a feature that when enabled in the Master allow DECT handset users to search for telephone numbers in a database stored locally on a Master.

Note:

If the phonebook functionality in the IPBS/IPBL is enabled, then the SMS feature in the AIWS2 is disabled. If an AIWS2 is connected, the central phonebook should be located in the AIWS2 instead of the IPBS/IPBL.

Import Entries to the Central Phonebook

Note:

When importing new entries to the central phonebook, existing entries will be overwritten.

In the Master, do as follows:

1. Select Services > Phonebook.
2. Select the Enable check box.
3. Enter the phonebook number in the *Phonebook Number* field, i.e. the phonebook number the DECT handsets are using to access the phonebook. Check that the phonebook number does not conflict with any of the DECT handsets in the system. The default phonebook number is 999999.
4. Enter the IP address to the TFTP server (IP-PBX) in the *Server IP Address* field.
5. In the *External Directory File* field, enter the path to the IP-PBX's external phonebook.
6. In the *Internal Directory File* field, enter the path to the IP-PBX's internal phonebook.
7. In the *Synch. Interval [min]* field, enter the database synchronization interval in minutes. A value between 10 and 30000 can be entered.
8. Click "OK".
9. If a Standby Master is used, repeat the above steps for the Standby Master also.

Users

This section describes the Users sub menu and how to do the following:

- Show all registered users in the IP-DECT system.
- Search for user information.
- Add a user.
- Add a user administrator.
- Import a csv file with user information.
- Export a txt file with user information.

- Show all anonymous registered handsets in the IP-DECT system.
- Add an anonymous handset.
- Import a csv file with IPEI numbers for anonymous handsets.
- Export a txt file with IPEI numbers for anonymous handsets.

Show all Registered Users in the IP-DECT System

Shows both User Administrator and Users.

1. Select Users > Users.
2. Click "show".

It is possible to change the order of the list by clicking on the headings.

Search for User Information

It is possible to search for users registered in the system by name or extension number. Search for a user following the steps:

1. Select Users > Users.
2. Enter the name or number to search for in the text field. You can enter the whole name or the beginning of the long name.
3. Click "show".

Add a User

For information on how to add users to the IP-DECT system, see [Add Users](#) on page 80.

Add a User to Another IP-DECT System

To allow handsets to identify the system to which the subscription shall be directed (e.g. the same physical area may be covered by different systems), it may be necessary to enter an initial PARK into a handset.

To view the PARK and the PARK 3rd party code:

1. Select Users > Users.

PARK: Must be used for Avaya handsets. Can also be used for other handsets if they support a PARK that matches the SARI.

PARK 3rd party: Must be used for handsets that do not support a PARK that matches the SARI.

For information on how to subscribe the user's handset to the other IP-DECT system, see the reference guide for the handset.

Add a User Administrator

For information on how to add user administrator to the IP-DECT system, see [Managing user administrators](#) on page 70.

Import Users from a csv or txt file

If many users should be added, it is possible to import a csv or txt file with the IPEI / IPDI.

Field name	Description	Max. characters
Long Name	Mandatory, the name of the user, need to be unique throughout the system. This is the name presented in a called party's display, unless this is configured in the IP-PBX.	30
Display Name	Optional, will be shown in the handset display when the handset is idle.	30
Name	Optional, the user name.	30
Number	Mandatory, the phone number extension, need to be unique throughout the system.	30
Password	Optional, is used for registration towards the gatekeeper.	15
IPEI / IPDI	The unique identification number of the handset.	
Auth. Code	Optional, the individual authentication code for this user. Automatically created by default. Can be modified manually.	

The rows in the csv or txt file can have the following format:

Long Name;Display Name;Name;Number;Password;IPEI/IPDI;Auth Code;

Different separators can be used in a delimiter-separated file. Import of files with semicolon (;) or Tab as separators is supported.

1. Select Users.
2. Click "Import".
3. Click "Browse" to locate the csv or txt file.
4. Click Open > Next Make sure the correct number of entries are correct.
5. Click Next

Limitations

- Maximum 1000 rows in the csv or txt file.

- The maximum size of csv or txt file is 128 Kb. If the file is too large, divide the file into several files.
- Only the new user data is imported. The existing user data is not deleted.
- Existing user data cannot be updated.
- If the separator is wrong, an error message will be displayed.
- The Authentication Code (AC) can not be entered in the csv or txt file for safety reasons. The system generates a AC for every user in the list. If the user needs the AC the administrator will have to use Show, see [Show all Registered Users in the IP-DECT System](#) on page 161.

Export the Users to a txt file

The Users can be exported to a txt file, for example for editing or backup reasons.

1. Click "Export".
2. Click "Save" in the dialog window that appears.
3. Enter a name of the file and select in which folder the file should be saved.
4. Click "Save".

Note:

For safety reasons, the Auth. Code and Password will not be included in the txt file.

Show all anonymous registered handsets

The IPEI / IPDI number is displayed on anonymous registered handsets.

1. Select "Users".
2. Select "Anonymous".

Add an anonymous handset

1. Select Users > Anonymous.
2. Click "new".
3. Enter the IPEI for the anonymous handset.
4. Click "OK".

For information on how to assign the anonymous handset to a user, see [Anonymous Registration](#) on page 81.

Import Anonymous Handsets from a csv or txt file

The anonymous handsets IPEI can be imported from a csv or txt file.

The csv or txt file can have the following format with one IPEI per line:

- IPEI
- IPEI
- IPEI
- IPEI

1. Select Users > Anonymous.
2. Click "import".
3. Click "Browse" to locate the csv or txt file.
4. Click Open > Next. Make sure the correct number of entries are correct.
5. Click Next

Limitations

- Maximum 1000 rows in the csv or txt file.
- The maximum size of csv or txt file is 128 Kb. If the file is too large, divide the file into several files.
- Only the new IPEIs are imported. The old IPEIs are not deleted.
- Existing IPEIs cannot be updated.

Export Anonymous Handsets to a txt file

The anonymous registered handsets IPEI can be exported to a txt file, for example for editing or backup reasons.

1. Select Users > Anonymous.
2. Click "export".
3. Click "Save" in the dialog window that appears.
4. Enter a name of the file and select in which folder the file should be saved.
5. Click "Save".

Device Overview

Radios

Information about the devices in the IP-DECT system.

1. Select Device Overview > Radios.

Name	The unique identification name. The name syntax is ipbs-xx-xx-xx (IPBS1), ipbs2-xx-xx-xx (IPBS2) or ipbl-xx-xx-xx (IPBL), where xx-xx-xx should be replaced with the last 6 hexadecimal digits of the MAC address.
RFPI	Radio Fixed Part Identity.
IP Address	The IP address, click on the IP address to access the configuration GUI of that IPBS/IPBL.
Sync	The current synchronization status. Should be "Master OK", "Slave OK" or "Standby OK" if synchronized. "Standby" is a Radio configured as a Sync Master but it is active.
Region	The sync region which the Radio belongs to.
Device Name	The name entered in the general menu.
Version	The current software version.
Connected Time	The elapsed time since connected to the Master.

Add Radios

In the Uninitialized Registrations section, uninitialized Radios not registered to a PARI Master are shown.

1. Select Device Overview > Radios
2. Click "Add" to add the Radio to the Master.
3. In the Add Radio window enter a name for the device. You can also add a Standby Master IP Address and a Sync Region.
4. Click "OK".
5. The Radio restarts and it establishes a connection to the PARI Master only.

Delete Radios

In the Static Registrations section, initialized Radios no longer registered to the PARI Master are shown.

1. Select Device Overview > Radios
2. In the Static Registrations section, click "Delete" to delete the Radio.

The Radio's RFPI is now released and can be reused. All other RFPIs in use are not affected.

Move RFPIs

In the Static Registrations section, initialized Radios no longer registered to the PARI Master are shown. If it is vital that the new device keeps the RFPI for the broken device e.g. alarm localization purposes, move the RFPI for the broken device to the new device registered to the PARI Master.

1. Connect the replacing device.
2. Add the Radio to the PARI Master, see [Add Radios](#) on page 165.
3. Select Device Overview > Radios
4. In the Static Registrations section, click "Move" for the Radio that is broken.
5. In the Move RFPI window, select in the Destination section the new Radio that you want to move the broken Radio's RFPI to.
6. Click "Move".

Existing RFPI on the new Radio is replaced by the broken Radio's RFPI. The new Radio's RFPI is now released and can be reused. All other RFPIs in use are not affected. The broken Radio will be deleted from the Static Registrations section.

RFPs

This section only applies to the IPBL.

Information about the DECT devices connected to the IPBL. For explanation on the information, see the table below.

1. Select Device Overview > RFPs.
2. Click the applicable port to open the RFP details pop-up window.
3. The following actions are available:
 - Click "OK" to save your settings and close the pop-up window.
 - Click "Cancel" to close the pop-up window.
 - Click "Refresh" to update the information.
 - Click "Reset" to reset the RFP.

RFP Logging

An IPBL can retrieve logs from connected DB1s. A DB1 continuously produce logs by default, but during normal operation there will be few logs. Detailed logs will be produced if the DB1 experience a major event, such as an unexpected restart.

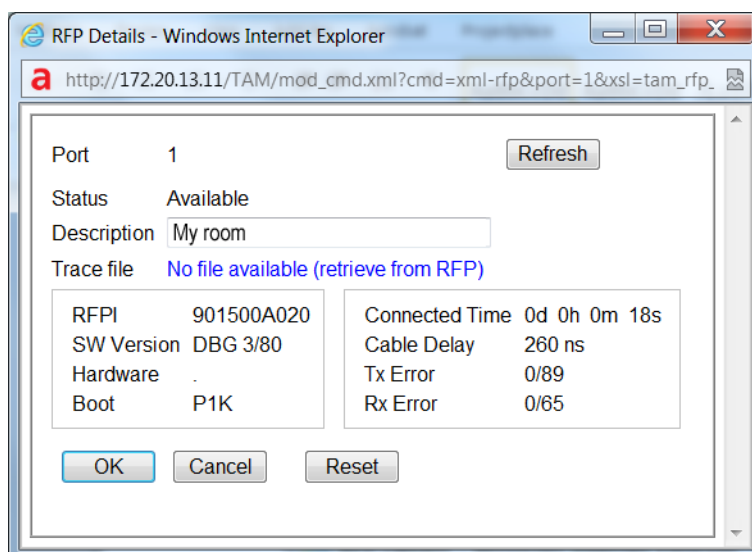
Retrieving an RFP Log

To retrieve a log, do as follows:

1. Select Device Overview > RFPs.
2. Click the applicable port (blue text link) to open the RFP details pop-up window.
3. Click on the blue retrieval text link "No file available (retrieve from RFP)" (see [figure](#) on page 168). The log is being prepared for download which may take up to 3 to 4 minutes ([figure 9](#)). The retrieval link will thereafter turn into the blue text link "Download" ([figure 10](#)).
4. Click on the blue text link "Download" and open or save the log.

Note:

The log can only be downloaded once. It is removed from the RFP after download. Logs are stored in the volatile memory and will be lost if the RFP loses power for whatever reason.



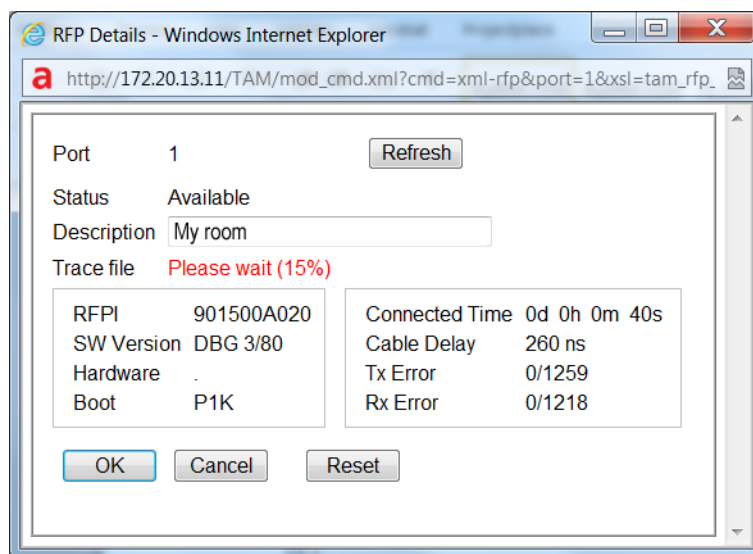


Figure 9.

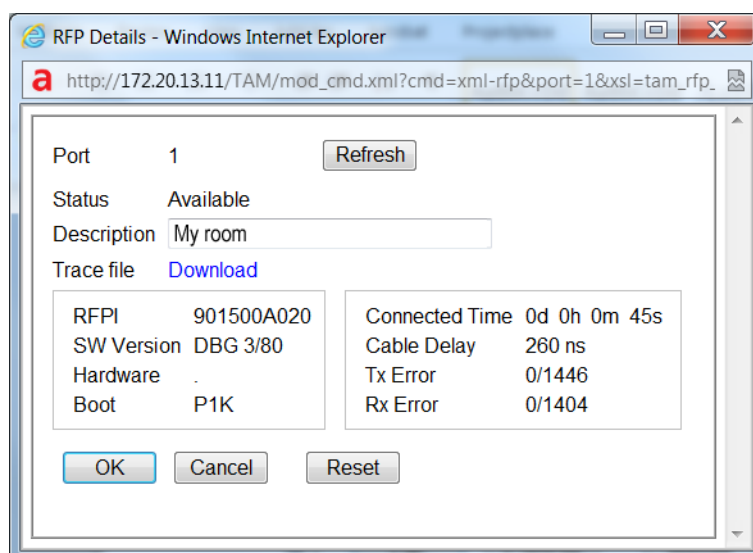


Figure 10.

Halted Logs

At certain major events, such as an unexpected restart, the logging will be halted so that the major event can be investigated. When the logging has been halted, the blue RFP link on the RFP overview (Device Overview > RFPs) will turn red (see [figure 11](#)). The logging will be restarted after the log has been downloaded.

Note:

An unexpected RFP restart will be indicated by the fault code 0x000e000a under Diagnostics > Events.

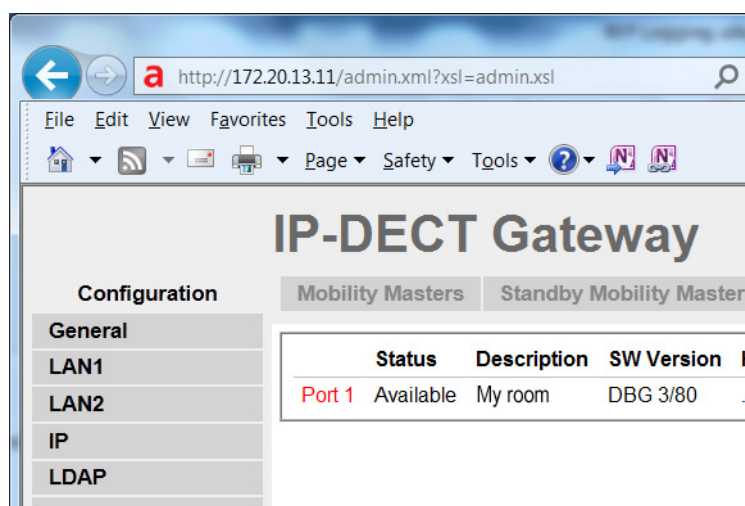


Figure 11.

Sync Ring

This section only applies to the IPBL.

A wire map of the synchronization ring is available in the GUI. The identities (IPBL-xx-xx-xx) of the IPBLs and the position in the ring is displayed. If the ring is broken it is possible to locate where. Click the IP address to access another IPBL.

1. Select DECT Sync > Sync Ring.

Sync Ports

This section only applies to the IPBL.

Displays the current status of the synchronization ports.

1. Select DECT Sync > Sync Ports.

Status	The current status of the port.
Sync Offset	The synchronization offset for the IPBL.
Cable Delay	The delay caused by the cable.
Sync Lost Counter	The number of times synchronization lost.
Communication	The present status of communication.

Connected to	The IP address of the IPBL connected.
Tx Error	The number of transmitting errors.
Rx Error	The number of receiving errors

Air Sync

This section only applies to the IPBS.

Air Sync status is displayed in the Device Overview > Air Sync menu. For explanation on the information shown for the active and the alternative sync bearers, see the table below.

RFPI	Radio Fixed Part Identity is the Id number of the sync bearer.
Carrier	The carrier used for air synchronization
Slot	The slot used for air synchronization
Hop	The number of hops from the Sync Master to the sync bearer
RSSI	Received Signal Strength Indication
FER	Frame Error Rate, a value between 0 and 100%. For a good synchronization, the FER should be 0. It is OK to occasionally have a high FER, but only for short periods (up to one minute).

Sync Lost Counter in IPBS

This section will describe briefly the different situations when the “sync lost counter” is incremented and what impact it has for the users.

Sync Lost Counter

When an IPBS increments the sync lost counter it means that the IPBS stops to handle all radio traffic for a while and after that restarts the synchronization procedure. The radio part is not really restarted but out of service for a short time period. The IP-part of the IPBS is not affected by this but is in service all the time.

There are five reasons for when the sync lost counter is incremented:

- The IPBS has not been able to find a synchronization source within 9 minutes.
- The PSCN value is changed.
- The value for frame number is changed.
- The value for multi frame number is changed.

- The number of enabled carriers is changed.

If the PSCN, frame number, multi frame number and/or the number of enabled carriers is changed, then the radio stops to handle traffic immediately.

Impact for the Users

During speech

If the radio stops to handle traffic as described in [Sync Lost Counter](#) on page 170, it does not necessarily mean a disconnected call. In a system with good overlapping coverage it might be possible to make a handover to another IPBS without disconnecting the call. If the handset does not quickly find any other IPBS the call will be disconnected and the handset will indicate “No System”. As soon as the IPBS is synchronized it is available again for handset communication. The handset will then connect to the system in the same way as for a normal power on.

In idle mode

In idle mode the user will most likely not discover any problem. Since the handsets have a short delay before showing “No System” the handset has time to roam to another IPBS. This requires a good overlap between radio cells to make it possible for the handset to roam to another IPBS. If no other IPBS is available the handset(s) will indicate “No System”. As soon as the IPBS is synchronized it is available again for handset communication. The handset will then connect to the system in the same way as for a normal power on.

DECT Sync

Air Sync Overview

This section only applies to the Master.

To see a graphic presentation of the air synchronization in a system, select DECT Sync > Air Sync Overview.

The internal synchronization for each region is shown separately by an expandable tree view, see [figure 12](#). The green, yellow and red dots in the sync tree show the following sync status for the Radios:

- Green: Synchronized
- Yellow: Synchronized but poor received signal strength (RSSI < -83 dBm)
- Red: Unsynchronized

The grey dot at top in the sync tree shows that it is a reference sync RFPI.

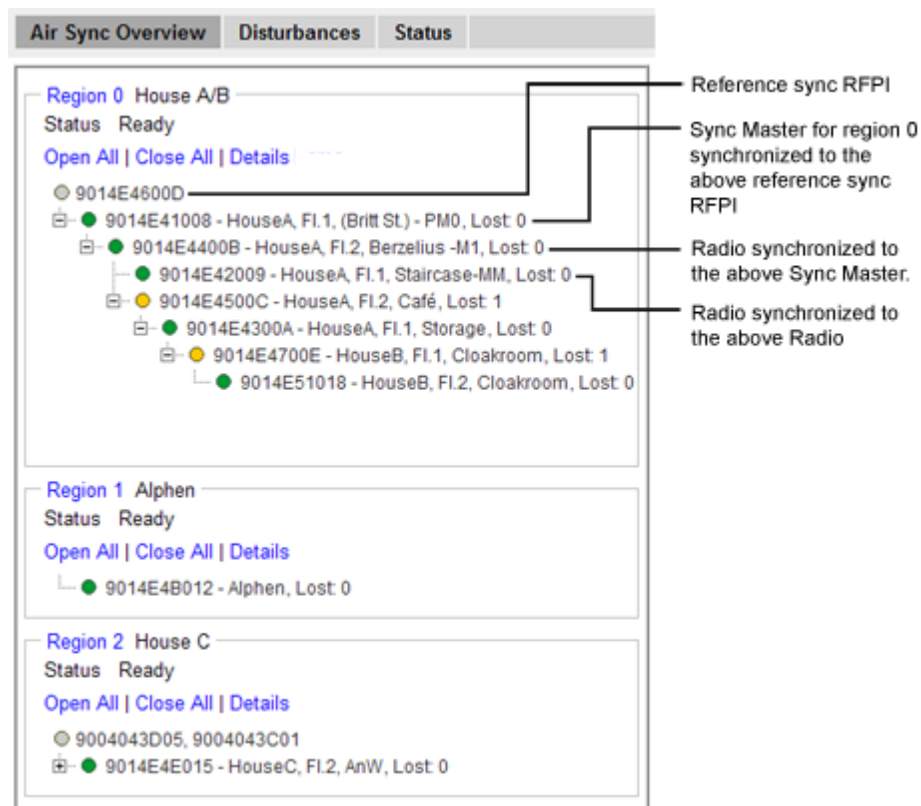


Figure 12. The sync trees for region 0, 1 and 2 where region 0 is fully expanded.

Region Details

1. Select DECT Sync > Air Sync Overview.
2. Click on the region ID text at top above the sync tree.
3. If this has not already been done: In the Region Details window, enter a name for the region.
4. In section Statistics, there are three counters:
 - Calculations: Is incremented each time the sync tree is calculated.
 - Configurations: Is incremented when an IPBS has received a new sync instruction.
 - Sync Lost: Is incremented when an IPBS stops to handle radio traffic for a while and after that restarts the synchronization procedure.
 To clear the counters, click "Clear".

Reference Synchronization

To get the Sync Master to resynchronize to the reference sync, do as follows:

1. Select DECT Sync > Air Sync Overview.

2. Click on the region ID text at top above the sync tree.
3. In the Region Details window, click "Start". When resynchronizing, all ongoing calls in the region will be disconnected.

IPBS Details

1. Select DECT Sync > Air Sync Overview.
2. Click on the "Details" text link above the sync tree. The sync tree will now display name and sync lost counter for the IPBSs in the region. The sync lost counter is a counter that is incremented when the IPBS stops to handle radio traffic for a while and after that restarts the synchronization procedure.

Disturbances

This section only applies to the Master.

1. Select DECT Sync > Disturbances.
2. Click "Start".

A list of potential disturbances is shown, that is, alien DECT systems that have a higher signal strength than the current sync signal.

Status

This section only applies to the IPBS.

Air Sync status is displayed in the DECT Sync > Status menu. For explanation on the information shown for the active and the alternative sync bearers, see the table below.

Sync offset	Adjustment of frequency in progress performed by the current IPBS so it can be in synchronization with the synch source.
Drift	The time difference between the current IPBS and its sync source.
Sync lost counter	A counter that is incremented when the IPBS stops to handle radio traffic for a while and after that restarts the synchronization procedure.
RFPI	Radio Fixed Part Identity is the Id number of the sync bearer.
Carrier	The carrier used for air synchronization
Slot	The slot used for air synchronization
Hop	The number of hops from the Sync Master to the sync bearer

RSSI	Received Signal Strength Indication
FER	Frame Error Rate, a value between 0 and 100%. For a good synchronization the FER should be 0. It is OK to occasionally have a high FER, but only for short periods (up to one minute).

Traffic

Traffic information is displayed in the Traffic sub menu. For the Master the traffic information for the IP-DECT system is displayed as well as traffic information for the Radio itself (if this Radio is enabled).

Display All Ongoing Calls in the System

All ongoing calls in the IP-DECT system can be displayed by selecting Traffic > Master Calls in the Master. See the table below for information about the different statistics fields.

Master	
Calls In	The total number of incoming calls to the Master.
Calls In Delivered	The number of connected incoming calls in the Master.
Calls Out	The number of outgoing calls from the Master.
Handover	The number of handovers in the Master.
Handover Cancelled	The number of cancelled handovers in the Master. Occurs when the handset decides to stay on the original Base Station.
Abnormal Call Release	The number of abnormal call terminations. A call release can occur if for example the user leaves the system's coverage area. To analyze the events, select Diagnostics > Events. To analyze how calls are connected and disconnected, select Diagnostics > Logging and select the <i>DECT Master</i> check box.
Busy Hour Call Attempts	The number of calls under the busiest hour counting from when pressing the Clear button.
Busiest hour start time	The start time of the busiest hour counter which was started when pressing the Clear button.

Display Calls

All calls on an IPBS/IPBL can be displayed by selecting Traffic > Radio Calls. See the table below for information about the different statistics fields.

Radio	
Calls In	The number of incoming calls to the Radio.
Calls Out	The number of outgoing calls from the Radio.
Handover	The number of handovers in the Radio.
Handover Canceled	The number of failed handovers in the Radio. NOTE: There can be several reasons for uncompleted handovers occurring. This will in most cases not cause dropped or disconnected calls.

Handover

During call, all ongoing handovers in the IP-DECT system can be displayed by selecting Traffic > Handover in the Master.

Backup

The IPBS/IPBL configuration can be downloaded and saved on a disc or a server. This is useful when identical configuration should be applied to several IPBSs/IPBLs, for example when configuring the Radios in a system. For information on how to load a saved configuration on the IPBS/IPBL, see [System Downgrade for IPBS2 and DB1](#) on page 180.

1. Select Backup > Config.
2. Click "download".
3. Click "download with standard password" to save the configuration with the default system password.
4. Click "Save" in the dialogue window and browse to the place where the configuration should be saved.
5. Click "Save".

Software Upgrade

The RFP version information is not displayed in the IPBS2 GUI. RFP software is more integrated now and this information becomes obsolete. In IPBS1 the RFP software has a separate flash memory, but this is not the case for IPBS2. On the IPBS1 the RFP version is still displayed.

Before Upgrading

1. For safety, take a backup of the configuration parameters for the Master and Standby Master.
2. Make a note of the Master and Standby Master IP address.

On the device configured as Master, continue with step 3 to 5 below.

3. When upgrading from software version 2.X.X to later: Select DECT > SMS and make a note of the AIWS2 IP address.
4. When upgrading from software version 2.X.X to later: Select DECT > Master and make a note of the SIP proxy (registrar) IP address, found in the Gatekeeper IP Address text field.
5. When upgrading from software version 2.X.X to later: Select DECT > Master and make a note of the alternative SIP proxy (registrar) IP address, found in the Alt. Gatekeeper IP Address text field.

Upgrading Sequence

1. Upgrade firmware and boot file of Standby Mobility Master, see [Software Upgrade from 2.X.X](#) on page 177 and [Software Upgrade](#) on page 177.
2. Upgrade firmware and boot file of Mobility Master, see [Software Upgrade from 2.X.X](#) on page 177 and [Software Upgrade](#) on page 177.
3. Upgrade firmware and boot file of Radios, see [Software Upgrade from 2.X.X](#) on page 177 and [Software Upgrade](#) on page 177.

When upgrading from software version 2.X.X to later: Update configuration of Radios, see [Configuration After Updating the Firmware From Software Version 2.X.X to Later](#) on page 178.

4. Upgrade firmware and boot file of Standby Master, see [Software Upgrade from 2.X.X](#) on page 177 and [Software Upgrade](#) on page 177.

When upgrading from software version 2.X.X to later: Update configuration of Standby Master, see [Configuration After Updating the Firmware From Software Version 2.X.X to Later](#) on page 178.

When upgrading from software version 3.X.X to later: Update configuration of Standby Master, see [Configuration After Updating the Firmware From Software Version 3.X.X to Later](#) on page 179.

5. Upgrade firmware and boot file of Master, see [Software Upgrade from 2.X.X](#) on page 177 and [Software Upgrade](#) on page 177.

When upgrading from software version 2.X.X to later: Update configuration of Master, see [Configuration After Updating the Firmware From Software Version 2.X.X to Later](#) on page 178.

When upgrading from software version 3.X.X to later: Update configuration of Master, see [Configuration After Updating the Firmware From Software Version 3.X.X to Later](#) on page 179.

Software Upgrade from 2.X.X

1. When upgrading from software version 2.X.X to later: Disable LDAP replication for all Radios except in the case of Standby Master to Master Replication. Select LDAP > Replicator and make sure that the Enable check box is not selected.
2. When upgrading from software version 2.X.X to later: Update the firmware to 2.4.0 or later 2.X.X. See [Update Firmware](#) on page 181 for more information on how to update the firmware.
3. Reset in order to make the changes take effect, see [Reset](#) on page 190.
4. Update the firmware to 3.4.12. See [Update Firmware](#) on page 181 for more information on how to update the firmware.
5. Reset in order to make the changes take effect, see [Reset](#) on page 190.
6. Update the boot file to 3.0.26. See [Update the Boot File](#) on page 181 for more information on how to update the boot file.
7. Reset in order to make the changes take effect, see [Reset](#) on page 190.
8. To update the IPBS Web GUI, press CTRL+F5 on the keyboard or close the IPBS Web GUI and start it again in order to update the GUI.
9. Continue with [Software Upgrade](#) on page 177.

Software Upgrade

1. Update the firmware to the latest. See [Update Firmware](#) on page 181 for more information on how to update the firmware.
2. Update the boot file to the latest. See [Update the Boot File](#) on page 181 for more information on how to update the boot file.
3. Reset in order to make the changes take effect, see [Reset](#) on page 190.

4. To update the IPBS Web GUI, press CTRL+F5 on the keyboard or close the IPBS Web GUI and start it again in order to update the GUI.

Configuration After Updating the Firmware From Software Version 2.X.X to Later

The following configuration settings should be changed in the Web GUI after updating the firmware from version 2.X.X to later.

Radio Configuration

1. Select DECT > Radio and enter the name and password for the Pari Master.
2. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Master/Standby Master Configuration

For both Master and Standby Master, do as follows:

1. If the Radio is activated, select DECT > Radio and enter the name and password for the Pari Master in the Name and Password text fields.
2. For Standby Master only: Enter the address to the Master in the Primary Master IP Address text field.
3. Select UNITE > SMS and enter the address to the AIWS2 in the IP Address text field.
4. Select DECT > Master.
5. Select the Enable Pari function check box.

If SIP/UDP, SIP/TCP or SIP/TLS protocol is used, continue with step 6 to 11 below:

6. Enter the IP address to the SIP proxy (registrar) in the Proxy text field.
7. Enter the IP address to the alternative SIP proxy (registrar) in the Alt. Proxy text field.
8. Select the Enbloc Dialing check box.
9. Select the Allow DTMF through RTP check box.
10. Select the Register with number check box.
11. To update the Web GUI, press CTRL+F5 on the keyboard or close the Web GUI and start it again in order to make the new menu to appear.
12. If H.323 protocol is used: Enter the address to the gatekeeper in the Gatekeeper IP Address text field.
13. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Configuration After Updating the Firmware From Software Version 3.X.X to Later

Master/Standby Master Configuration

When upgrading from version 3.X.X to later the MWI will automatically be set to Off. If the MWI was enabled prior to the upgrade: Select DECT > Suppl. Serv. and select an MWI mode in the MWI Mode drop-down list.

When upgrading a system from software version 3.X.X to later, existing system administration accounts remain configured locally in the IPBS(s)/IPBL(s). However, it is recommended that the system administration accounts are configured centrally instead by moving them to the Kerberos server. To have the system administration accounts configured locally is a potential security risk. For information on how to configure Kerberos, see [Centralized Management of Admin/Auditor Accounts Using Kerberos](#) on page 88.

To move the system administration accounts to the Kerberos server, do as follows:

Step 1:

For each IPBS/IPBL where system administration accounts have been configured locally, do as follows:

1. Select General > Admin.
2. Go to the Additional Administrator and Auditor Accounts section.
3. Write down each accounts configuration data such as the user name, password (when known) and role.

Step 2:

On the Kerberos server, do as follows:

1. Select General > Kerberos Server.
2. Go to the Users section and enter the configuration data for each account that was written down in step 1 above.
3. Click "OK".

Step 3:

For each IPBS/IPBL where system administration accounts have been configured locally, do as follows to delete the local system administration accounts:

1. Select General > Admin.
2. Go to the Additional Administrator and Auditor Accounts section.
3. For each account row, select the Delete check box.
4. Click "OK".

All local system administration accounts are deleted and the Additional Administrator and the Auditor Accounts section is no longer visible. The system administration accounts are now instead configured centrally on the Kerberos server.

System Upgrade from Software Version 4.X.X to 7.0.X

Radios with software version 4.X.X will not be able to connect to a Pari Master with software version 7.0.X. It is therefore recommended when doing a manual upgrade (i.e. when not using an update server) to upgrade Radios first and then the Pari Master.

System Downgrade for IPBS2 and DB1

This section applies only to IPBS2 and DB1 with the following article numbers that can be found on the label on the backside of the device:

- IPBS2-**A
- DB1-**A

Note:

When downgrading, minimum version of the software that runs on IPBS2 is 7.2.11 and on DB1 it is R3E.

Update

This section describes how to do the following configurations and settings.

- Update Configuration
- Update Firmware
- Update the Boot File
- Update the RFPs

Update Configuration

A previously saved configuration can be loaded and activated on the IPBS/IPBL. See [Backup](#) on page 175 for information on how to save a configuration.

1. Select Update > Config.
2. Click "Browse..." and browse to the saved configuration.

3. Click "Upload".
4. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Considerations when updating of configuration

Configuration files are only fully compatible if the backup and restore are done on products that have CPUs with the same endianness. Both IPBS1 and IPBL have "big-endian" CPUs compared to IPBS2 which have "little-endian" CPU. Hence, IPBS1 and IPBL are compatible.

If a device (e.g. IPBS2) is configured and the configuration is taken from another type of device (e.g. IPBS1), some lines in the configuration will be skipped by the configured device (IPBS2). This is because devices of different types do not have the same hardware and some configuration lines are therefore not applicable in the configured device (IPBS2).

Update Firmware

Updated software files are distributed by your supplier.

There are three ways to update the firmware:

- Using an update server. See [Appendix A: How to Configure and Use the Update Server](#) on page 203.
- Using a device manager.
To set up a connection to a Device Manager, see [Device Management](#) on page 153. To update the firmware using a Device Manager, see the Installation and Operation Manual for AIWS2.
- Manual update, see below.

To update manually:

1. Select Update > Firmware.
2. Click "Browse..." and browse to the firmware file.
3. Click "Upload"
4. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Update the Boot File

Updated software files are distributed by your supplier.

There are three ways to update the boot file:

- Using an update server, see [Appendix A: How to Configure and Use the Update Server](#) on page 203.
- Using a device manager.
To set up a connection to a Device Manager, see [Device Management](#) on page 153. To update the firmware using a Device Manager, see the Installation and Operation Manual for AIWS2.

- Manual update, see below.

To update manually:

1. Select Update > Boot.
2. Click "Browse..." and browse to the boot file.
3. Click "Upload".
4. Reset in order to make the changes take effect, see [Reset](#) on page 190.

Update the RFPs

This section only applies to the IPBL.

Updated software files are distributed by your supplier.

There are two ways to update the RFPs:

- Using an update server, see [Appendix A: How to Configure and Use the Update Server](#) on page 203.
- Manual update, see below.

To update manually:

In the RFP status list, information on connected RFPs are displayed.

1. Select Update > RFPs.
2. Click "Browse..." and browse to the RFP update file.
3. Click "Upload".

Upgrade RFP Software

Firmware File \\seprjaw\\klas\\sw\\rfp\\Worf4_GAP_R4H.S2

Update start time ☒ Immediate ☐ Scheduled

Month Day Hour (0-23) Minute (0-59)

April 6 0 0

In sequence ☐

When idle ☐

Port	Status	Description	SW version	Upgrade
1	Available		R4H 3/40	<input type="checkbox"/>
2	Available	E81009	R4H 3/40	<input type="checkbox"/>
3	Available	E8403A	R4H 3/40	<input type="checkbox"/>
4	Disconnected	9014E8302B		<input type="checkbox"/>
5	Disconnected			<input type="checkbox"/>
6	Disconnected			<input type="checkbox"/>
7	Disconnected			<input type="checkbox"/>
8	Disconnected			<input type="checkbox"/>

Start Cancel

Figure 13. Upgrade the RFP.

4. Select "Immediate" or "Scheduled" update.
5. Select "In sequence" check box to update the selected RFPs one by one.
6. Select "When idle" check box to start the update when the RFP is idle.
7. Mark the applicable RFPs to be updated.
8. Click "Start" to upgrade the selected RFPs.

The RFP restarts after the upload is finished.

System Upgrade in System with Mobility Masters

Upgrade in the following order:

1. Upgrade all Standby Mobility Masters.
2. Upgrade all Mobility Masters.
3. Upgrade all of the remaining devices for each site by following the upgrade sequence under [Upgrading Sequence](#) on page 176.

Note:

Roaming between sites is only possible when the sites have the same software version.

Replacing Master Hardware in Multiple Master System

If a faulty Master IPBS shall be replaced with a new one, perform the following steps otherwise all the subscription data will be lost when connecting the new Master:

1. Disconnect the faulty Master.
2. Wait at least 2 minutes.
3. On the Mobility Master, select Device Overview > Masters and delete the faulty Master.
4. Connect the new Master and upload the configuration from the faulty Master. For information on how to upload a configuration on the new Master, see [Update Configuration](#) on page 180.

Replacing Master Hardware in a System with a Crypto Master Active

If a faulty Master is replaced with a new one, then the faulty Master must be deleted in the Mobility Master. The reason for deleting the replaced Master is that the Crypto Master is operable only if all Masters, part of the Crypto Master hierarchy, are connected.

Replacing Mobility Master Hardware in a System with a Crypto Master Active

If a faulty Mobility Master is replaced with a new one, then the faulty Mobility Master must be deleted in the Crypto Master. The reason for deleting the replaced Mobility Master is that the Crypto Master is operable only if all Mobility Masters, part of the Crypto Master hierarchy, are connected.

Diagnostics

Logging

The IPBS/IPBL can generate a number of logs which can be useful when supervising and troubleshooting the IP-DECT system. For information on how to collect the log files, see [Enable or disable the radio](#) on page 144. For a description of each log, see the table below.

Setting	Description
TCP	Logs generated upon TCP connection set-ups in the H.225 / H.245 protocol.
Gateway Calls	Logs generated by calls that go through the gateway interface.
Gateway Routing	Logs generated by calls that are routed through the gateway interface.
H.323 Registrations	Logs generated upon RAS registration.
H.323/TCP Registrations	Logs generated upon RAS registration.
H.323/TLS Registrations	Logs generated upon RAS registration.
DECT Master	Logs generated by the Master software component in the IPBS/IPBL.
DECT Radio	Logs generated by the Radio software component in the IPBS/IPBL.
DECT Stack	A low level DECT log, intended for support departments.
Config Changes	Logs generated upon configuration changes in the IPBS/IPBL or the IP-DECT system.

1. Select Diagnostics > Logging.
2. Select which logs to generate by selecting the check box next to the log name.
3. Click "OK".
4. View the logs by clicking the "syslog" link. The logs are updated in real-time.

Tracing

The information gathered from the trace functionality is mainly used for troubleshooting in case of failure in the system. The trace information is intended for the support departments.

It is possible to trace traffic information on the LAN for troubleshooting purposes.

1. Select Diagnostics > Tracing.

2. Select the Enable check box in the Remote PCAP section to enable the use of a network protocol analyzer program, for example Wireshark.
3. The Trace check box in the Remote PCAP section is mainly used by the R&D department to follow the desired network attributes.
4. Select the TCP/UDP Traffic check box in the IP section to capture traffic information.
5. Click "OK".

Alarms

Under Diagnostics > Alarms are all active alarms displayed.

An alarm is a fault that affects the normal service of the IP-DECT system and may require action from personnel to correct it. An IP-DECT Master can collect alarms from Radios and it can display all active alarms in the system. If an object is removed from the system, object-related alarms are automatically cleared after a timeout period of 30 minutes. Active alarms are also cleared if the related object is restarted.

For a description of the attributes, see the table below.

Attribute	Description
Time	The date and time when the alarm is issued.
Code	A unique number that identifies the alarm. Click the code to get more detailed information about the alarm. For a list of possible codes and their descriptions, see Fault Code Descriptions on page 195.
Severity	It has three possible states: <ul style="list-style-type: none"> • Critical - Immediate action is required. It is displayed, for example, if a managed object goes out of service. • Major - Urgent action is required. It is displayed, for example, if the capability of the managed object is severely degraded. • Indeterminate - Level of severity cannot be determined
Remote	The IP Address of the object that reported the alarm. Click the IP address to access the object.
Source	The software module that reported the alarm. Together with the code it uniquely identifies an alarm.
Description	A textual description of the alarm.

Events

Under Diagnostics > Events is history of alarms and errors displayed including active alarms. Click "Clear" in the top-right corner to clear the list of alarms and errors.

For a description of the attributes, see the table below.

Attribute	Description
Time	The date and time when the alarm, error is issued or cleared.
Type	The status of the fault. It has four possible states: <ul style="list-style-type: none"> Alarm - Alarms displayed in red are active alarms Alarm cleared - The alarm is already cleared Alarm timeout - The alarm exceeded the timeout period Error - Refers to faults that are not active for a specific time.
Code	A unique number that identifies the alarm. Click the code to get more detailed information about the alarm. For a list of possible codes and their descriptions, see Fault Code Descriptions on page 195.
Severity	It has three possible states: <ul style="list-style-type: none"> Critical - Immediate action is required. It is displayed, for example, if a managed object goes out of service. Major - Urgent action is required. It is displayed, for example, if the capability of the managed object is severely degraded. Indeterminate - Level of severity cannot be determined
Remote	The IP Address of the object that reported the alarm. Click the IP address to access the object.
Source	The software module that reported the alarm. Together with the code it uniquely identifies an alarm.
Description	A textual description of the alarm.

Performance

It is possible to check different performance parameters. For a description of the parameters, see the table below.

Parameter	Description
CPU	Shows CPU utilization. To have a 100% utilization for a longer time is not good but occasional peaks are acceptable. Reason for high utilization may be caused by running SRTP. Another reason may be that there are a lot of users registered on the Master.
CPU-R	Shows utilization of CPU resources allocated by different tasks. If the CPU resources are fully utilized it will prevent connection of more calls. One solution in that case can be to install an additional Base Station in the same coverage area.
MEM	Shows utilization of the RAM memory. If the utilization is continuously and significantly increasing then it can be due to memory leakage. It can also be due to a large number of simultaneous ongoing events. Another reason can be that a Base Station has too much to handle and a solution can be to divide the roles of Pari Master, Radio etc. on several Base Stations. The displayed utilization curve will never decrease as it shows the amount of memory that has been dedicated to a specific memory pool. Within each memory pool it can still be reused.
ETH0	Shows the traffic on the Base Station's ethernet interface.
Concurrent calls	Shows the number of simultaneous ongoing calls on the Base Station's air interface. Maximum number of calls that can be handled simultaneously in air is 8. If the number of concurrent calls is 8 for a longer time, a solution could be to add an additional Base Station to the system.
Temperature (only for IPBL)	Shows the temperature of the cabinet.
Voltage (only for IPBL)	Shows the power supply voltage level. An alarm warning about high voltage will be sent at 54 V. An alarm warning about low voltage will be sent at 42 V. The IPBL will shut down when the voltage drops below 36 V or goes above 60 V.
Current (only for IPBL)	Shows the power supply current consumption.

1. Select Diagnostics > Performance
2. Select the checkbox(es) for the desired performance statistics.
3. Click "OK".

4. One window shows statistics for the last 24 hours. The maximum possible value is displayed in the top-left corner. Click the left or right arrow buttons to see different time frames.

Config Show

Under Diagnostics > Config Show, the configuration is displayed as a text output.

Ping

The ping function is used to determine the response time from the IPBS/IPBL to a certain IP address. It can be used to analyse the connection between the IP-DECT system components.

1. Select Diagnostics > Ping.
2. Enter an IP address in the IP Address text field.
3. Press "Enter" on the keyboard.

Traceroute

The traceroute function displays how packets travel from the IPBS/IPBL to a certain IP address. The result is an ordered list of IP addresses with the measured round trip time.

1. Select Diagnostics > Traceroute.
2. Enter an IP address in the IP Address text field.
3. Press "Enter" on the keyboard.

Environment

This section only applies to the IPBL.

The environment tab gives information power supply and consumption. It also display temperature and fan status.

1. Select Diagnostics > Environment.
2. The following information is available in the Power section:
 - Power supply - AC or DC power port.
 - Voltage - input voltage.
 - Current consumption - total consumption for the IPBL an the connected RFPs.
 - Max current consumption is 1,9/0,9 A when supplied with 110/230 VAC.
 - Max current consumption is 5,2 A when supplied with 48 VDC.
3. The following information is available in the Environment section:
 - Temperature - °C

- Fan status - OK, Failure.

RFP Scan

This section only applies to the IPBS.

To scan for occupied system IDs of other IP-DECT systems within the coverage area, perform an RFP scan following the steps below.

Note: Executing an RFP scan will terminate all calls on the IPBS.

1. Select Diagnostics > RFP Scan
2. Click "Start Scanning"

Service Report

To download a service report do the following:

1. Select Diagnostics > Service Report.
2. Click "download".
3. Click "Save" and browse where to save the service report.

Reset

Some configuration changes requires a reset in order to take effect. A reset reboots the software. There are two ways to perform a reset:

- Idle reset - waits until there are no active calls in the IPBS/IPBL.
- Immediate reset - clears all calls and resets the IPBS/IPBL.

Idle Reset

1. Select Reset > Idle Reset.
2. Click "OK".
3. The IPBS/IPBL will reset when there are no active calls.

Immediate Reset

1. Select Reset > Reset.
2. Click "OK".
3. The IPBS/IPBL will terminate all active calls and reset.

TFTP Mode

Note:

When the IPBS/IPBL is in TFTP mode it can only be reached using the gwload utility. This mode should not be used during normal operation.

Boot

When the IPBS/IPBL is in Boot mode it uses a small version of the firmware (minifirmware) which contains only the IP stack and the web interface.

1. Select Reset > Boot.
2. Click "OK".

Reset Using the Reset Button

It is possible to do a hardware reset of the IPBS and IPBL by pressing the reset button. The button is accessed through a hole in the back of the IPBS (IPBS1: [figure 1](#) on page 16, IPBS2: [figure 2](#) on page 19) and on the front of the IPBL ([figure 4](#) on page 23).

Note:

Use a pointed object in an non conducting material to perform a reset.

Short press < 1 sec	Restart
Medium press ~3 sec. For IPBS2: When 3 sec. has gone, the LED on IPBS2 will start to flash in blue and the reset button can then be released.	Restart in TFTP mode. In TFTP mode the IPBS and IPBL can be accessed only through the gwload application. This mode is intended for support and development departments.

<p>Long press ~ 10 sec.</p> <p>For IPBS2: When 10 sec. has gone, the LED on IPBS2 will start to flash in blue, indicating the start of the factory reset process. Hence the reset button can then be released.</p> <p>When the LED (LED 1 for IPBS1) is steady amber/yellow, the factory reset process is complete. The device can now be restarted by disconnecting the supply voltage.</p>	<p>Factory reset - all configuration parameters will be set to default values.</p>
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Commissioning

This section describes the visual inspection and tests that must be executed after completing the installation and initialization of the IP-DECT system. The purpose of the visual inspection and tests is to verify that all installation activities have resulted in a correctly functioning system. If it appears that a part is malfunctioning while the system is installed correctly (that is, no cabling faults, no configuration faults), the technician must consult the maintenance section included in this manual for fault finding.

Radio coverage verification tests

The radio coverage verification consists of two tests:

- Base station operation test
- Coverage area test

Note:

Be sure that all batteries in the handset are charged before executing the tests.

Base Station Operation Test

The purpose of this test is to check if all base stations are operational.

1. Put a handset in the service display mode (DCA mode), see applicable User Manual for the handset.
2. Use the base station plan, see the applicable System Planning documentation for IP-DECT.
3. Move close to each base station and check that the handset locks to it (the service display should display the correct number).

After having checked that all base stations are operational proceed with the coverage area test.

Coverage Area Test

The purpose of this test is to verify that there is satisfactory field strength to enable good speech quality everywhere within the covered area (rooms, lift shafts, staircases). This test is executed with two handsets and requires two persons.

1. Place the handset in the service display mode (DCA mode) and call the other handset. One user of the handset should now start moving around the covered area. Both users must check that a good speech quality is maintained everywhere. Special attention should be paid to areas such as edges of the building and areas behind metal structures where there is a possibility of reduced speech quality.

2. Mark areas where cracking sounds or mutes are heard.

Evaluation

After having performed the coverage area test, the results should be evaluated. If the coverage is not sufficient you should review the planning and move or add equipment.

Cordless Extension Number Test

This test checks for each handset the complete connection from the IP-DECT system to the PBX. Furthermore it checks that the handsets' numbers have been correctly programmed. The test is performed by calling all handset from one specific handset.

1. Put all handset together in order of extension number on a table.
2. Go off-hook with each handset and check that the dial tone is heard.
3. Call with a handset (handset A) all other handsets sequentially and check that the handset with the corresponding number on its display rings when called.
4. Call handset A and check if it rings.

Troubleshooting

Updating with new firmware using the Gwload tool

If the firmware is corrupt, for example if firmware download is interrupted the IPBS/IPBL could become unreachable by the web GUI. It will not be possible to load new firmware or to start correctly. If this occurs, the IPBS/IPBL runs on the bootcode and the Gwload tool, a tftp-style client used to repair a broken firmware, can be used to upload new firmware.

1. Download the Gwload software from the IP-DECT system provider.
2. Set the IPBS/IPBL in TFTP-mode by performing a medium (~3 sec) hardware reset, see [Reset Using the Reset Button](#) on page 191.
3. Start a command window.
4. To update with new firmware, execute the following command from the folder where the gwload.exe file is located:

IPBS:

```
gwload /setip /i <ipaddress> /gwtype 1201 /prot <..path/
firmwarefilename> /go
```

IPBL:

```
gwload /setip /i <ipaddress> /gwtype 4001 /prot <..path/
firmwarefilename> /go
```

5. If there is more than one IPBS/IPBL in TFTP mode, select the unit to update and press enter.

Fault Code Descriptions

This section lists the possible fault codes, their description and severity level.

Explanation of the table columns **C**, **M** and **I**:

C = Critical (IP-DECT) / Critical (Unite)

M = Major (IP-DECT) / Error (Unite)

I = Indeterminate (IP-DECT) / Warning (Unite)

Description	Code	Device	C	M	I
The LDAP replicator is not connected (Users)	0x00030001	IPBS/IPBL		X	
CPU resources are not available (Radio)	0x00030101	IPBS/IPBL			X

Standby master active (Master)	0x00030201	IPBS/IPBL		X	
User registration failure (Master)	0x00030202	IPBS/IPBL		X	
Connection to Radio lost (Master)	0x00030204	IPBS/IPBL		X	
Primary/redundant trunk is down (Master)	0x00030205	IPBS/IPBL		X	
Master active (Master) This event is generated when the Mirror becomes active.	0x00030206	IPBS/IPBL			X
Master inactive (Master) This event is generated when the Mirror becomes inactive.	0x00030207	IPBS/IPBL			X
Limit of static radios is reached (Master) This is an alarm which is generated when the number of radios in the radios list (Device Overview > Radios) is reaching 2100. The alarm is cleared once the number of radios goes below 2100.	0x00030208	IPBS/IPBL		X	
No Media data received (RTP) No RTP packets from remote side were received on a connected call. This points to either a NAT problem (private RTP address was given to remote side) or a general signaling problem (media negotiation).	0x00050001	IPBS/IPBL		X	
Excessive loss of data (RTP) This event is generated if in a period of 10s more than 3% received RTP packets were lost. This is an indication of a network problem and it is recommended to check the involved media IP addresses and what kind of device that is involved.	0x00050002	IPBS/IPBL		X	
Wrong payload type received (RTP) Caused by signaling/negotiation problems (interoperability). An endpoint sends RTP packets with a payload type other than negotiated. Wrong Payload Type is a message if there is a Media Problem with a another PBX.	0x00050003	IPBS/IPBL		X	
Stun failed (RTP)	0x00050004	IPBS/IPBL		X	
Unexpected message (H323) A message was received, which was not expected by the protocol in this state. This could be caused by network problems or by incompatible equipment.	0x00060001	IPBS/IPBL		X	
Status inquiry (H323)	0x00060002	IPBS/IPBL		X	
Signaling TCP failed (H323) The signaling transport connection could not be established. This usually means, the destination (IP) is not reachable. Check network connectivity.	0x00060003	IPBS/IPBL		X	
Signaling timeout (H323) A signaling timer expired. The reason for this could be a network problem or an interop problem.	0x00060004	IPBS/IPBL		X	
Invalid URL (WebMedia)	0x00080001	IPBS/IPBL		X	
Coder missing in URL (WebMedia)	0x00080002	IPBS/IPBL		X	

Unexpected restart (watchdog/reset/power on) (Cmd) The system was restarted because of watchdog, trap or by pressing the reset button. This event is generated 60s after the restart.	0x000b0001	IPBS/IPBL		X	
Unexpected message (TLS)	0x000c010a	IPBS/IPBL			X
Unexpected message (TLS)	0x000c020a	IPBS/IPBL			X
Bad MAC (TLS)	0x000c0114	IPBS/IPBL			X
Bad MAC (TLS)	0x000c0214	IPBS/IPBL			X
Decryption failed (TLS)	0x000c0115	IPBS/IPBL			X
Decryption failed (TLS)	0x000c0215	IPBS/IPBL			X
Record overflow (TLS)	0x000c0116	IPBS/IPBL			X
Record overflow (TLS)	0x000c0216	IPBS/IPBL			X
Decompression failure (TLS)	0x000c011e	IPBS/IPBL			X
Decompression failure (TLS)	0x000c021e	IPBS/IPBL			X
Handshake failure (TLS)	0x000c0128	IPBS/IPBL			X
Handshake failure (TLS)	0x000c0228	IPBS/IPBL			X
No certificate (TLS)	0x000c0129	IPBS/IPBL			X
No certificate (TLS)	0x000c0229	IPBS/IPBL			X
Bad certificate (TLS)	0x000c012a	IPBS/IPBL			X
Bad certificate (TLS)	0x000c022a	IPBS/IPBL			X
Unsupported certificate (TLS)	0x000c012b	IPBS/IPBL			X
Unsupported certificate (TLS)	0x000c022b	IPBS/IPBL			X
Revoked certificate (TLS)	0x000c012c	IPBS/IPBL			X
Revoked certificate (TLS)	0x000c022c	IPBS/IPBL			X
Expired certificate (TLS)	0x000c012d	IPBS/IPBL			X
Expired certificate (TLS)	0x000c022d	IPBS/IPBL			X
Unknown certificate (TLS)	0x000c012e	IPBS/IPBL			X
Unknown certificate (TLS)	0x000c022e	IPBS/IPBL			X
Illegal parameter (TLS)	0x000c012f	IPBS/IPBL			X
Illegal parameter (TLS)	0x000c022f	IPBS/IPBL			X
Unknown CA (TLS) A TLS connection could not be established because the CA of the remote certificate is not trusted. Check the rejected certificates for details.	0x000c0130	IPBS/IPBL			X
Unknown CA (TLS) A TLS connection could not be established because the remote party does not trust the CA of the certificate of this device.	0x000c0230	IPBS/IPBL			X
Access denied (TLS)	0x000c0131	IPBS/IPBL			X
Access denied (TLS)	0x000c0231	IPBS/IPBL			X

Decode error (TLS)	0x000c0132	IPBS/IPBL			X
Decode error (TLS)	0x000c0232	IPBS/IPBL			X
Decryption error (TLS)	0x000c0133	IPBS/IPBL			X
Decryption error (TLS)	0x000c0233	IPBS/IPBL			X
Export restriction (TLS)	0x000c013c	IPBS/IPBL			X
Export restriction (TLS)	0x000c023c	IPBS/IPBL			X
Protocol version (TLS)	0x000c0146	IPBS/IPBL			X
Protocol version (TLS)	0x000c0246	IPBS/IPBL			X
Insufficient security (TLS)	0x000c0147	IPBS/IPBL			X
Insufficient security (TLS)	0x000c0247	IPBS/IPBL			X
Internal error (TLS)	0x000c0150	IPBS/IPBL			X
Internal error (TLS)	0x000c0250	IPBS/IPBL			X
User cancelled (TLS)	0x000c015a	IPBS/IPBL			X
User cancelled (TLS)	0x000c025a	IPBS/IPBL			X
No renegotiation (TLS)	0x000c0164	IPBS/IPBL			X
No renegotiation (TLS)	0x000c0264	IPBS/IPBL			X
Service not found (Kerb client) The host account of the device has been deleted on the Kerberos server. Join the Kerberos realm again.	0x000c0403	IPBS/IPBL		X	
Kerberos server unreachable (Kerb client) The device did not get a response from the Kerberos server. Make sure that the Kerberos server is up and its address is well configured on the devices.	0x000c0406	IPBS/IPBL		X	
Kerberos cross realm failure (Kerb client) <i>Kerberos: Cross-realm trust not configured:</i> The user tried to log-in with a user account from a Kerberos realm that does not trust or is not trusted by the realm of the device. <i>Kerberos: Cross-realm password mismatch:</i> The password for the cross-realm trust is not the same on both of the Kerberos servers.	0x000c0407	IPBS/IPBL		X	
Certificate validation is disabled until system time is set (X509) System time is not set but the current date is needed to validate if cryptographic certificates are valid. Therefore encrypted TLS connections will fail. Configure a NTP server or set the system time manually.	0x000c1000	IPBS/IPBL			X
Certificate expired/Will expire soon (X509) The device certificate or one of the trusted certificates has already expired or will expire during the next 30 days. After the certificate has expired TLS connections using this certificate will fail. Replace the certificate with a new one.	0x000c1001	IPBS/IPBL			X

RFP disconnected (TAM)	0x000e0001	IPBL		X	
RFP malfunctioning (TAM)	0x000e0002	IPBL		X	
RFP disabled (TAM)	0x000e0003	IPBL		X	
RFP software download (Dwl)	0x000e0004	IPBL		X	
RFP unsynchronized (RFPInit) <i>Four common reasons:</i> 1. The IPBS has lost contact for nine minutes with the RFPI used as synchronization source. 2. The IPBS is not PSCN synchronized (Primary Receiver Scan Carrier Number). 3. The IPBS is not MFN synchronized (Multiframe Number). 4. The IPBS is not slot number synchronized.	0x000e0005	IPBS		X	
Synchronization to reference system lost (RFPInit) Get the Sync Master to resynchronize to the reference sync either manually or automatically (scheduled). To select type of resynchronization action, see Configure Sync Master IPBS on page 148. To resynchronize manually, see Reference Synchronization on page 172.	0x000e0006	IPBS		X	
Other DECT system with same sysid detected (RFPInit)	0x000e0008	IPBS		X	
Sync master failed to resynchronize to reference (RFPInit)	0x000e0009	IPBS		X	
RFP restarted Burst mode controller of the IPBS restarted.	0x000e000a	IPBS		X	
High temperature (TAM)	0x000f0001	IPBL	X		
High power consumption (TAM)	0x000f0002	IPBL	X		
Supply voltage low (TAM)	0x000f0004	IPBL	X		
Supply Voltage High (TAM)	0x000f0008	IPBL	X		
Fan failure (TAM)	0x000f0010	IPBL		X	
Synchronization ring broken (Sync)	0x00100001	IPBL		X	
Reference synchronization signal lost (Sync)	0x00100002	IPBL		X	
Synchronization lost (Sync)	0x00100004	IPBL		X	
Unsynchronized to reference (Sync)	0x00100008	IPBL		X	
Interface down (ipproc)	0x00110000	IPBS/IPBL		X	
Interface not configured (ipproc)	0x00110001	IPBS/IPBL			X
DHCP server not responding (ipproc)	0x00110002	IPBS/IPBL		X	
Invalid UDP-RTP port base/range (ipproc)	0x00110019	IPBS/IPBL		X	
Invalid UDP-NAT port base/range (ipproc)	0x0011001a	IPBS/IPBL		X	
Invalid NAT port base/range (ipproc)	0x0011001b	IPBS/IPBL		X	
ARP poisoning detected (ipproc)	0x00110041	IPBS/IPBL		X	
Out of TCP/NAT ports (ipproc)	0x00110046	IPBS/IPBL		X	
Out of TCP ports (ipproc)	0x00110047	IPBS/IPBL		X	

TCP bind error (ipproc) Local error. TCP socket was trying to bind itself to a specific local port number. The port number was found to be in use by some other socket.	0x00110049	IPBS/IPBL		X	
Out of UDP/RTP ports (ipproc)	0x00110050	IPBS/IPBL		X	
Out of UDP ports (ipproc)	0x00110051	IPBS/IPBL		X	
UDP bind error (ipproc) Local error. UDP socket was trying to bind itself to a specific local port number. The port number was found to be in use by some other socket.	0x00110053	IPBS/IPBL		X	
No route to destination (ipproc)	0x0011005a	IPBS/IPBL		X	
No route to destination, if down (ipproc) The IP routing process failed to deliver a packet explicitly directed to a specific network interface. The network interface was either down or disabled. Packets directed to a specific network interface are used for example by DHCP (UDP) and by PPTP Tunnels (TCP/GRE). If this error is reported for UDP broadcast packets rather often it usually indicates that DHCP client mode is configured for the interface but the interface is not connected to a network or disabled. In this case the DHCP mode should be changed to disabled.	0x0011005b	IPBS/IPBL		X	
No route to destination, if unknown (ipproc)	0x0011005c	IPBS/IPBL		X	
No route to destination, if unconfigured (ipproc)	0x0011005d	IPBS/IPBL		X	
No route to destination, no gateway (ipproc)	0x0011005e	IPBS/IPBL		X	
No route to destination, loop (ipproc)	0x0011005f	IPBS/IPBL		X	
Memory Usage above 85% (box)	0x00120001	IPBS/IPBL	X		
Radio busy for speech (Dect)	0x00140001	IPBS			X
Default encryption key timeout (Dect) Too long delay in the LAN/WAN network for early encryption to work. The problem can be solved by configuring a local Mobility Master. Even though a local Mobility Master is configured, the fault message will not disappear, i.e. it will be shown at first location registration attempt when the home Master must be reached. At the next location registration attempt, the key will be in the local Mobility Master and early encryption will work.	0x00140065	IPBS/IPBL			X
Cipher timeout (Dect) This indicates that a call has been forcefully disconnected since the cipher option has been disabled in the radio.	0x00140066	IPBS/IPBL		X	

Master connection timeout (Dect) A signaling timer expired. The reason for this could be a network problem between Radio and Master.	0x00140067	IPBS/IPBL		X	
Busy for speech (CLU)	0x00150001	IPBL			X
Data communications error (Provisioning)	0x00190001	IPBS		X	
Data communications put error (Provisioning)	0x00190002	IPBS		X	
Failed to transfer Unite communication block (Unite) Check that the Unite address is correct.	0x001a0001	IPBS/IPBL			X
ICP Connection down	0x00200000	IPBS/IPBL		X	
Read update script Failed to read script from update server.	0x00210001	IPBS/IPBL		X	
Upload bootcode Failed to get the bootcode from update server.	0x00210002	IPBS/IPBL		X	
Upload firmware Failed to get the firmware from update server.	0x00210003	IPBS/IPBL		X	
Upload config Failed to get the config from update server.	0x00210004	IPBS/IPBL		X	
Download config Failed to send the config to update server.	0x00210006	IPBS/IPBL		X	

Appendix A: How to Configure and Use the Update Server

A.1 Summary

Automatic update is based on configuration and firmware information stored on a standard web server and retrieved by the devices on a regular basis.

There are 2 modules in the device which work in tandem. The first is known as "UP0" and actually executes the upload and download of configuration information as well as the download of updated firmware. UP0 is controlled by commands as described below.

The second module is known as "UP1". It serves to poll a given website for changed configuration information. If certain conditions are met, UP1 will issue commands to UP0 to perform the requested updates.

UP0 can also receive commands from the "Update clients" page of the PBX Administration user interface.

A.2 System Requirements

One or more regular Web Server that can be accessed by all devices are required. This has been tested with Microsoft IIS and Apache, but any regular Web Server should do.

For best results, the Web Server should be able to maintain a large number of HTTP sessions simultaneously, since potentially all devices may attempt a configuration update at the same time. For example, Microsoft's Personal Web Server is not adequate, since it only support 10 simultaneous sessions.

Following URLs are supported: HTTP, HTTPS and TFTP.

A.3 Installation

To be able to upload (save) device configuration information on the web server, it must allow HTTP PUT requests. All other functions require HTTP GET permissions only.

Since all HTTP requests are performed unauthenticated, the website used must allow anonymous read (and potentially write) access. You may want to restrict access to that site to certain network address ranges.

Configure a Microsoft IIS URL to allow PUT commands:

1. Create a directory where you want to save configurations to
2. Create a virtual directory in Microsoft's IIS manager
3. Select "read" and "write" access

No installation is needed on the IPBS/IPBLs.

A.4 Configuration in IP-DECT

See [Configure Automatic Firmware Update](#) on page 154 on how to configure the IPBS/IPBLs for automatic update.

The URL parameter must point to the site where the file containing the commands is stored. Note that in this URL, no host names are supported. The web servers IP address must be used.

A.5 Setting the UP1 Parameters

The applet saves the configuration in a line starting config change UP1.

The full syntax is:

```
config change UP1 /url <url> [/poll <slow>] [/poll-fast <fast>] [/disc]
```

If the URL ends with a '/' then a default filename is used based upon the product in question. If for example the URL for an IPBS1 is "http://1.2.3.4/configs/", it is expanded to "http://1.2.3.4/configs/update-IPBS.htm".

	Command filename
IPBS1	update-IPBS.htm
IPBS2	update-IPBS2.htm
IPBL	update-IPBL.htm

The product type name used is the one used in the Version line on the devices Info page. Note that the extension is irrelevant, .htm or .txt or no extension at all may be used. On some Web servers, URLs are case sensitive.

The maintenance command file is retrieved initially after the configured poll interval (in minutes) is expired after boot. Short poll intervals can create substantial load on a big network. A value less than 15 minutes (which is the default) is therefore not recommended.

However, for new devices (that is, devices which have been reset to factory settings and never had a successful download of a maintenance command file), the command file is retrieved every minute (for up to 30 minutes). This is done so that a fresh device can quickly retrieve a site depending standard configuration when it is installed. You can change this initial polling interval using the /poll-fast <fast> parameter (this is not recommended).

The /disc parameter can be specified to force the device to close the http sessions used immediately.

When the maintenance command file is retrieved, the commands found in the file are executed in sequence. Theoretically, all commands which can be typed in to a telnet session to the device or which appear in a config file can be used in the command file. However, in most cases, you will use config change commands and commands to the UP0/UP1 modules.

The command file is executed every time it is retrieved (depending on the poll interval). However, in most cases, you don't want it to be executed each time, but only once. For example, if you are about to deploy a certain configuration change to all IPBSs, then you want this change to be done once per IPBS only. This can be achieved by the check command:

```
mod cmd UP1 check <final-command> <serial>
```

The devices maintain an internal variable UPDATE/CHECK which is initially (or when the device is reset to factory settings) empty. The check command will compare the <serial> parameter with the UPDATE/CHECK variable. If it is equal, any further processing of the command file is canceled.

If it differs, the remainder of the file will be processed and, after the last command is executed, the UPDATE/CHECK variable will be set to <serial> and the <final-command> will be executed. The following commands are useful values for <final-command>:

ireset	resets the device as soon it is idle
reset	resets the device immediately
iresetn	resets the device as soon it is idle, only if a reset is required
resetn	resets the device immediately, only if a reset is required
ser	this is a no-op

Often, configuration changes shall be made only during certain times (e.g. non-working hours). This can be achieved using the times command:

```
mod cmd UP1 times [/allow <hours>] [/initial <minutes>]
```

The times command will check the current time against <hours>. If it does not match this restriction, any further processing of the command file is cancelled. <hours> is a comma separated list of hours. Only those hours listed are considered valid times for execution of the command file.

```
mod cmd UP1 times /allow 12,23,1,2,3,4
```

The command above allows command executions only between 12:00 and 12:59 and 23:00 and 4:59 local time (on a 24h clock). Note that if the device has no time set, all command executions will be cancelled.

If the /initial parameter is set, the no commands will be executed within the first <minutes> minutes after the device has been booted. This is done to avoid firmware download and flashing when installing devices.

```
mod cmd UP1 times /allow 12,23,1,2,3,4 /initial 6
```

The command above suppresses any command file processing within the first six minutes after each boot of the device. If /initial is set, new devices (or those that have been reset to factory settings), the command file will be retrieved even if it normally would be suppressed by the /allow parameter. This allows new devices to retrieve a site specific standard configuration quickly.

A.6 Setting the UP0 Parameters

To perform a firmware update, use the following command:

```
mod cmd UP0 prot <url> <final-command> <build-serial>
```

The command above downloads the new firmware from <url> and flash it to the device, then <final-command> is executed.

The IPBSs maintain an internal variable UPDATE/PROT which is initially (or when the device is reset to factory settings) empty. The prot command will compare the <build-serial> parameter with the UPDATE/PROT variable. If it is equal, no firmware will be loaded or flashed. If there is no UPDATE/PROT yet (like for a new device), <build-serial> is compared against the build number of the current firmware. After a successful download, UPDATE/PROT is set to <build-serial>. Note that <build-serial> is not checked against the firmware version actually loaded. It is your responsibility to keep this consistent.

If <url> ends with a slash ('/'), then a default firmware filename is added to the URL depending on the type of the device.

	Firmware filename
IPBS1	ipbs.bin
IPBS2	ipbs2.bin
IPBL	ipbl.bin

```
mod cmd UP0 prot http://192.168.0.10/firm/ ireset 5.0.0
```

The command above determines if firmware 5.0.0 is already installed. If not, new firmware will be downloaded from the following location depending on type of device:

IPBS1: http://192.168.0.10/firm/ipbs.bin

IPBS2: http://192.168.0.10/firm/ipbs2.bin

IPBL: http://192.168.0.10/firm/ipbl.bin

The UPDATE/PROT variable will be set to 5.0.0 and the device will be reset as soon as it is idle.

Similar to the prot command, the boot command will update the boot code.

	Boot filename
IPBS1	boot_ipbs.bin
IPBS2	boot_ipbs2.bin
IPBL	boot_ipbl.bin

```
mod cmd UP0 boot http://192.168.0.10/firm ireset 5.0.0
```

The command above determines if boot code 5.0.0 is already installed. If not, new boot code will be downloaded from the following location depending on type of device:

IPBS1: http://192.168.0.10/firm/boot_ipbs.bin

IPBS2: http://192.168.0.10/firm/boot_ipbs2.bin

IPBL: http://192.168.0.10/firm/boot_ipbl.bin

The UPDATE/BOOT variable will be set to 5.0.0 and the device will be reset as soon as it is idle.

Using UP0, device configurations can be saved to a web server.

```
mod cmd UP0 scfg <url>
```

This will cause the device to upload its current config to url. This will be done using an HTTP PUT command. url must be writable thus. With url, some meta character strings are replaced as follows:

Sequence	Replacement	Example
#d	Current date and time	20040319-162544
#m	Device mac address	00-90-33-03-0d-f0
#h	Device hardware ID	ipbs-03-0d-f0
#b	Rolling backup index loops over 0 .. n-1 for each backup	5

Example IPBS1/IPBS2/IPBL Boot and Firmware Update

This example shows an "update file" for the IPBS1/IPBS2 and IPBL.

```
mod cmd UP0 prot http://172.20.8.128/avaya/firmware/ ireset 5.0.0
mod cmd UP0 boot http://172.20.8.128/avaya/boot/ ireset 5.0.0
```

A.7 Configuration File Backup

To make a backup of the configuration file, use the following command:

```
mod cmd UP0 scfg <url> [<final-command> <save-serial> [ /force
<hours>]]
```

The scfg command uploads the current configuration file to the specified <url>.

Example:

```
mod cmd UP0 scfg http://192.168.0.10/configs/saved/#h#b5.txt no-op
WEEKLY /force 168
```

The command above saves the device configuration file once a week with a backlog of 5 weeks.

A.8 Download Configuration File

To load a configuration file on the IP-DECT device use the following command:

```
mod cmd UP0 cfg <url> <final-command> <serial>
```

The command loads the configuration file, and all commands in it are executed.

A.9 Setting the RFP_UPDATE0 Parameter

To perform a RFP firmware update, use the following commands.

```
mod cmd RFP_UPDATE0 firmware http://192.168.0.10/Worf4_GAP_R4H.s2
```

The command above specifies the url to the RFP firmware to use.

```
mod cmd RFP_UPDATE0 select 0x2753
```

Specifies which RFPs to update using a hex-encoded bit-mask. Each bit represents an RFP port starting with port 1 at the LSB (0x0001) up to port 16 (0x8000).

0x2753 specifies RFP "1,2,5,7,9,10,11,14" to be updated.

```
mod cmd RFP_UPDATE0 schedule DD.MM.YYYY-HH:MM
```

Specifies when the update shall start. If no date is provided, the update will be immediate when the start command is issued.

```
mod cmd RFP_UPDATE0 start /idle
```

Starts the update or activates the schedule. Normally the /idle command is selected and an update starts only if the RFP is idle.

If multiple RFPs are selected for update, they will be updated one at a time If /sequence command is used.

Example Update RFP Firmware

This example shows an "update file" for the IPBL.

```
mod cmd UP1 check ser 20070316-1
```

```
mod cmd RFP_UPDATE0 firmware http://172.20.8.125/avaya/rfp/  
Worf123.S2
```

```
mod cmd RFP_UPDATE0 select 0xffff
```

```
mod cmd RFP_UPDATE0 start /idle
```

A.10 Configure Microsoft IIS as an Update Server

To be able to upload (save) device configuration information on the web server, it must allow HTTP PUT requests. All other functions require HTTP GET permissions only.

You may want to restrict access to that site to certain network address ranges.

To avoid entering authentication data in every IPBS/IPBL, it is recommended to allow anonymous read access. For write access (http PUT), authentication is needed with IIS ver. 6 and later. Authentication data needs to be configured in the devices that need to be backed up, e.g. the PARI Master, Master and Mobility Master.

Requirements for IP-DECT

- Version 5.1.X and later supports the authentication algorithm "md5-sess".

Requirements for Microsoft IIS

- Must be a Windows 2008 R2 server containing Microsoft IIS ver. 7.5.

To configure Microsoft IIS as an Update Server

The steps that are involved are shown in the figure below. The steps are described in more detail below the figure.

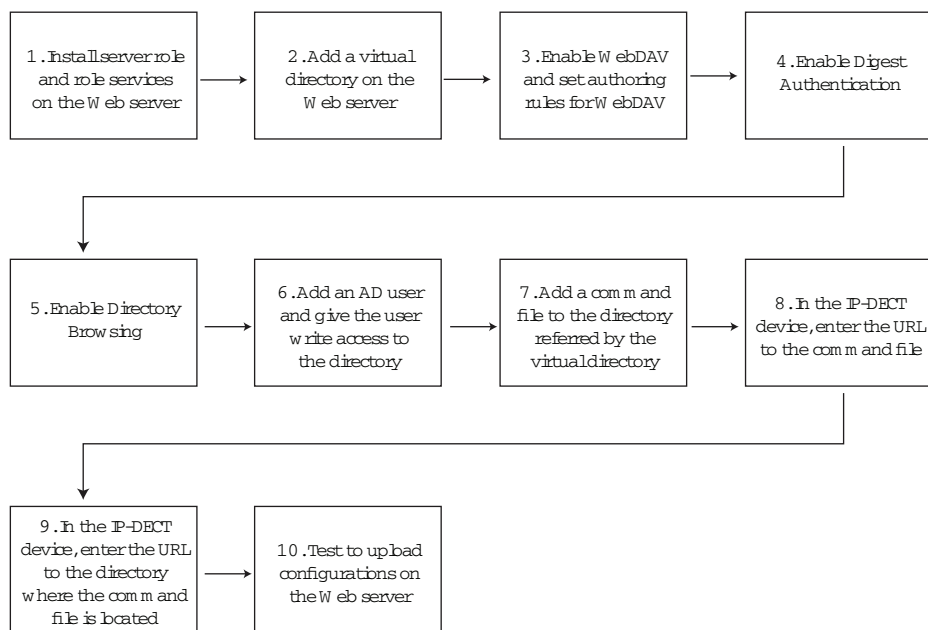


Figure 14. To configure Microsoft IIS as an Update Server.

1. Install server role and role services on the Web server

1. Connect to the Windows 2008 R2 server.
2. In Server Manager: Right-click on "Roles" and select "Add Roles" (menu item). The "Add Roles" wizard starts.
3. Click "Next".
4. Select the server role *Web Server (IIS)* check box.
5. Click "Next".
6. Click "Next".

7. Make sure that the following role services check boxes are selected and leave the rest unchecked:
 - Directory Browsing
 - WebDAV Publishing
 - Digest Authentication
8. Click "Next".
9. Click "Install".

2. Add a virtual directory on the Web server

10. In "Internet Information Services (IIS) Manager": Right-click on "Default Web Site" and select "Add Virtual Directory..." (menu item). The "Add Virtual Directory" window is shown.
11. In the *Alias* text field, enter a name for the virtual directory.
12. In the Physical path: field, click on the "..." button to the right of the field and browse to the location where the virtual directory shall be stored. Create a new virtual directory and name it.
13. Close the "Add Virtual Directory" window, click "OK".

3. Enable WebDAV and set authoring rules for WebDAV

14. In "Internet Information Services (IIS) Manager": Left-click on "Default Web Site".
15. Left-double click on "WebDAV Authoring Rules"
16. Left-click on "Enable WebDAV" (link).
17. Left-click on "Add Authoring Rule..." (menu item)". The "Add Authoring Rule" window is shown.
18. In section *Allow access to this content to:*, select the *All users* option.
19. In section *Permissions*, select the *Read*, *Source* and *Write* check boxes.
20. Click "OK".

4. Enable Digest Authentication

Note:

Digest Authentication requires that the Web server is joined to a domain.

21. Left-click on the virtual directory.
22. Left-double click on "Authenticaton" and left-click on "Enable" (link).

5. Enable Directory Browsing

23. Left-click on the virtual directory.

24. Left-double click on "Directory Browsing" and left-click on "Enable" (link).

6. Add an AD user and give the user write access to the directory

Note:

This section requires an existing Active Directory (AD) user.

25. Right-click on the virtual directory and left-click on "Edit Permissions..." (menu item). The *Properties* window for the virtual directory is shown.
26. Click on the *Security* tab.
27. Click on "Edit..." (button). The "Permissions for *virtual directory name*" window is shown.
28. Click on "Add" (button). The "Select Users, Computers, Service Accounts, or Groups" window is shown.
29. In the *Enter the object names to select (examples):* text field, enter the name of an AD user. Click on "Check Names" (button) to the right of the text field.
30. Click "OK".
31. In the "Permissions for *virtual directory name*" window: Allow modify permission for the AD user by selecting the *Allow* check box for the *Modify* permission.
32. Click "OK".
33. Click "OK".

7. Add a command file to the directory referred by the virtual directory

34. Add a command file to the directory referred by the virtual directory. For information on the command file syntax, see [A.6 Setting the UP0 Parameters](#) on page 206.

8. In the IP-DECT device (IPBS/IPBL), enter the URL to the command file

35. See [Configure Automatic Firmware Update](#) on page 154 on how to configure the IPBS/IPBLs for automatic update.

9. In the IP-DECT device (IPBS/IPBL), enter the URL to the directory where the command file is located

36. Select Services > HTTP Client.
37. In section *Authenticated URLs*, enter in the *URL* text field the URL to the directory.
38. In the *User* text field, enter the user name of the AD user that was given write access, see [6. Add an AD user and give the user write access to the directory](#) on page 211.
39. In the *Password* text field, enter the password.

10. Test to upload configurations on the Web server

40. During the test period, set the poll interval to 1 minute.

41. When the command file has been run, check that the label data in the IPBS/IPBL (select Services > Update) is the same as in the command file.
42. Check that the configuration file is located in the directory.

Appendix B: Local R-Key Handling

Local R-key handling assume that the check box for local R-key handling is selected, see [Enabling or disabling Local R-Key Handling](#) on page 125.

The following R-key functions are available during a call.

Key	Description
R	Put the ongoing call on hold and get a new line. (Dial the number to the second call.)
R0	Reject the incoming call.
R1	Terminate the ongoing call and switch to call on hold/incoming call.
R2	Switch between ongoing call and call on hold/incoming call.
R3	This function is normally used for initiate a conference call.
R4	<p>Transfer the call on hold to the ongoing call and disconnect.</p> <p>Note:</p> <p>In the Avaya Aura® SIP environment, you must disable the SIP Endpoint Managed Transfer (SEMT) parameter on Communication Manager to make attended transfer using the R4 key without any issues. In 372x and 374x handsets the attended transfer will not be captured in the call log.</p>
RR (unattended transfer)	Put the ongoing call on hold and dial the number to the destination where the last held call shall be transferred to.

Appendix C: Update Script for Configuration of Kerberos Clients

The update script is as follows:

```
mod cmd UP1 check resetn serial002

config add NTP0 /addr 192.168.42.136

config write

config activate

vars create CMD0/KCMD p <join+realm="negrealm1"+user="neguser1"+
password="negpwd1"+force="true"+disable-local="true"+kerberos-rc4=
"true"><server+realm="negrealm1"+address="192.168.42.34"><server+
realm="negrealm2"+addres="192.168.42.99"/></join>
```

Description of the update script:

Command line 1: `mod cmd UP1 check resetn serial002`

By inserting this into the update script file the update server will check the variable “check” and if the value (serial002) is different from the value in the update server this script will be executed and the box will be rebooted afterwards.

Command line 2: `config add NTP0 /addr 192.168.42.136`

By inserting this into the update script the local Time server is configured with IP address to valid time server and active time can be retrieved. Correct time is very important in Kerberos for joining of realm and for login purpose.

Command line 3: `vars create CMD0/KCMD p`

The format of this line is very important. It is very important to only modify the data surrounded with double quote (“”). This script describes the mandatory data, the other data is set to default values. All parameters set by the Add-tab (see section 1) is possible to set with this script.

The XML format is as follows:

```
<join realm="..." host="..." user="..." password="..." disable-local="..."
force="..."><server realm="..." address="..." port="..." secondary-address="..."
secondary-port="..." /></join realm>
```

realm: The realm to join

host: The host name for the box (optional, otherwise the hardware id will be used)

user: Admin user name from the Kerberos server

password: Admin password from the Kerberos server

disable-local: the config flag will be set accordingly (true or false, optional, defaulting to false)

force: tells if an existing realm membership shall be discarded (true or false, optional, defaulting to false)

server: multiple servers may be given

In the above example two servers are configured one for the Kerberos server and one if using an Active Directory or Standby Kerberos server.

Appendix D: Import Server Certificate in the web Browser

To access the GUI for an IPBS/IPBL using secure web access (https), the certificate for the IPBS/IPBL can be installed in the web browser to avoid getting certificate error messages.

To install the certificate, perform the following two steps:

Step 1. Create a certificate. See *D.1 Create a Certificate*.

Step 2. Install the certificate in the web browser. See *D.2 Import the Certificate*.

D.1 Create a Certificate

Note: Make sure the name you use to access the IPBS/IPBL is in the "Common Name" of the certificate (e.g. IP-address) or if the name is an FQDN, in the "DNS Name". The Web Browser will require a match when validating the certificate information.

Create a certificate by selecting one of the following two types of certificate handling options:

- Self-signed certificate

This option is for customers not planning on having their certificates signed by public or private CAs. Self-signed certificates provide encryption but do in most cases not provide authentication. For more information see [Self-signed Certificates](#) on page 104.

- Certificates signed by a Certificate Authority (CA)

Two options are possible:

A Certificates signed by the customer's own CA. Customers possessing the knowledge and infrastructure to house their own CA could build an internal enterprise CA, enabling them to sign (approve) their own certificate requests. This would make the customer a private CA.

B Certificates signed by a trusted public third party entity/organization. There are only about a dozen issuers who have the authority to sign certificates for servers worldwide. An example is VeriSign. To use a public CA for certificate approvals the IP-DECT system would in most cases need to be connected to the Internet and hold a fully qualified domain name. For more information see [Certificate Signing Request \(CSR\) or Certification Request](#) on page 38.

D.2 Import the Certificate

The instructions below apply for Internet Explorer version 8 and may differ for later versions.

Note:

If your PC is running Windows Vista or later, select "run as administrator" for Internet Explorer.

1. Access the GUI for an IPBS/IPBL. A security warning window will appear when using secure web access (https) to access the GUI.

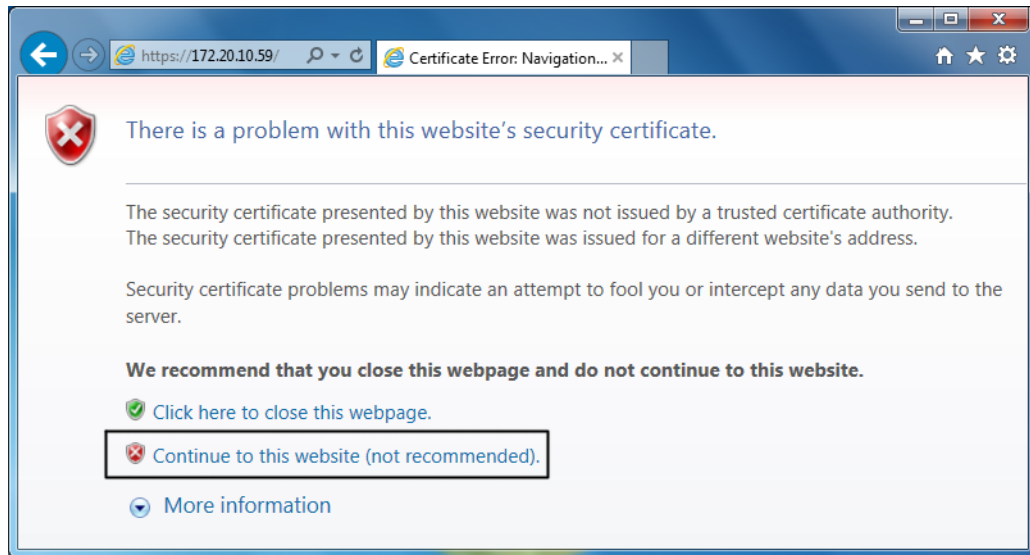


Figure 15. Security warning window.

2. In the security warning window, click on the text link "Continue to this website (not recommended)." The login window for the device will appear.
3. Click on the "Certificate Error" notification in the Security Status bar (next to the Internet Explorer Address bar), see [figure 16](#). The Security Report window will appear, see [figure 17](#).

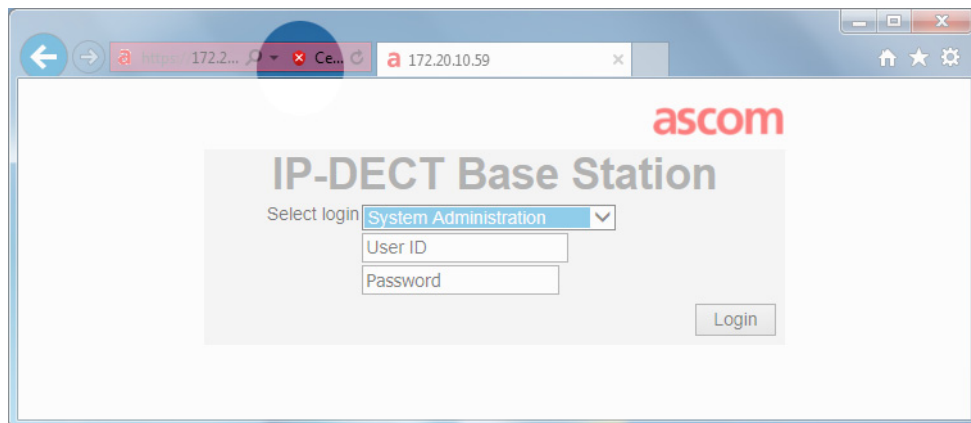


Figure 16. Screenshot of the login window, with the "Security Status bar highlighted.

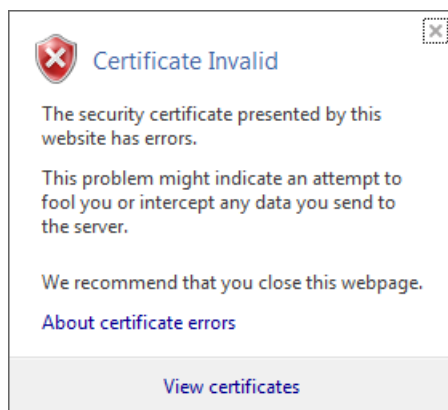


Figure 17. The Security Report window.

4. In the Security Report window, click on the blue text link "View certificates". The Certificate window will appear.

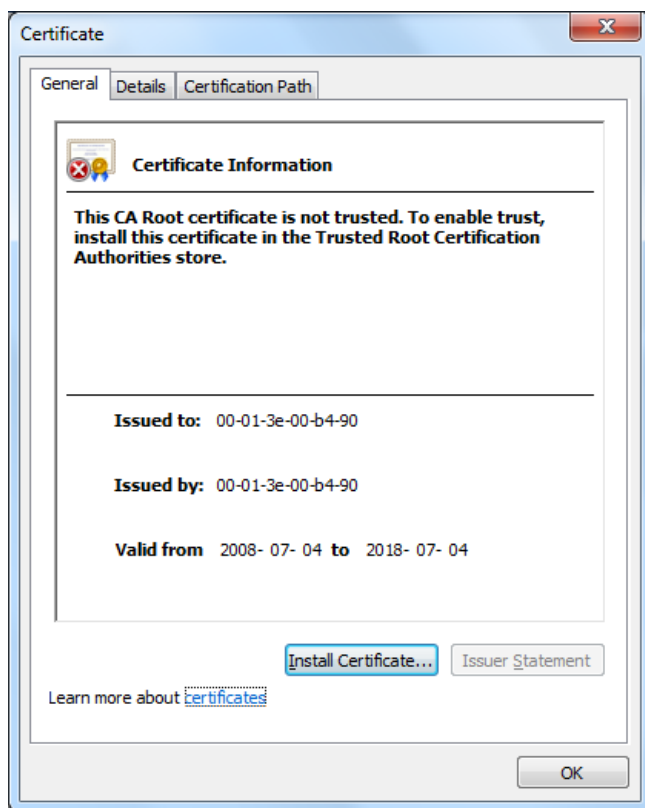


Figure 18. The Certificate window.

5. In the Certificate window, click on the button "Install Certificate...". The Certificate Import wizard is started.
6. Click on "Next".
7. Make sure that option "Automatically select the certificate store based on the type of certificate" is selected, see [figure 19](#). Click on "Next".

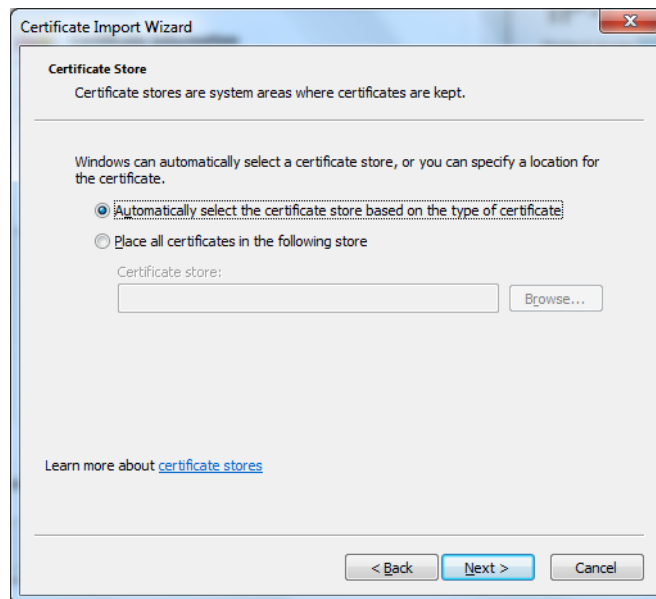


Figure 19. The Certificate Import wizard.

8. Click on "Finish" to complete the Certificate Import wizard. The Security Warning window will appear.
9. Click on "Yes" to install the certificate".

Appendix E: Import Client Certificate in the Web Browser

If mutual TLS authentication is used, a trusted client certificate with the associated private key must be available in the web browser's certificate store. IP-DECT uses the *Subject Alternative Name* (SAN) certificate extension to map a client certificate to a user account. The entity that issues the client certificate must use one of the following SAN formats when including the user id:

- rfc822Name - The user id is based on the e-mail format defined in the RFC 822 standard.
- otherName, Microsoft, User Principal Name (UPN) - The user id is based on the UPN format, used in Microsoft Windows system.

Importing Client Certificate

Perform the following steps to import the client certificate provided by your IT department in the web browser. The instructions below apply for Internet Explorer version 11 and may differ for later versions.

1. In the Windows Start menu, go to the Control Panel and select Network and Internet > Internet Options.
2. Click the "Content" tab and click "Certificates".

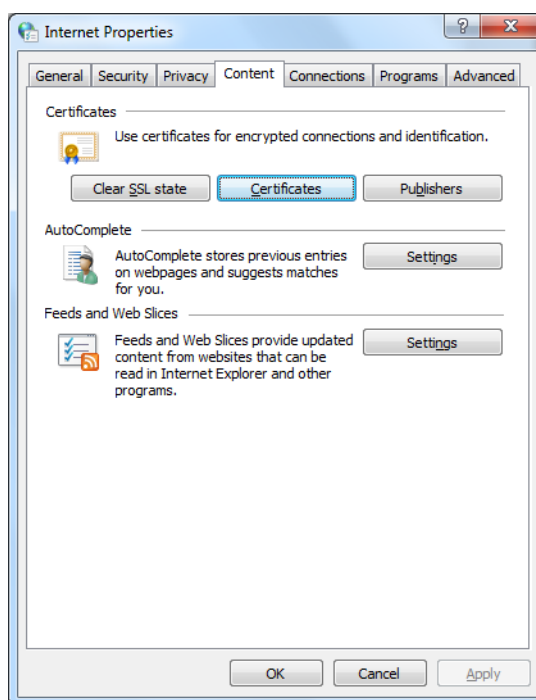


Figure 20. The Internet Properties window

3. Click "Import...". The Certificate Import Wizard opens.

4. Click "Next".
5. Click "Browse..." and find your client certificate provided by your IT department.
6. Click "Next".
7. Select "Place all certificates in the following store" and make sure that the *Personal* certificate store is selected.

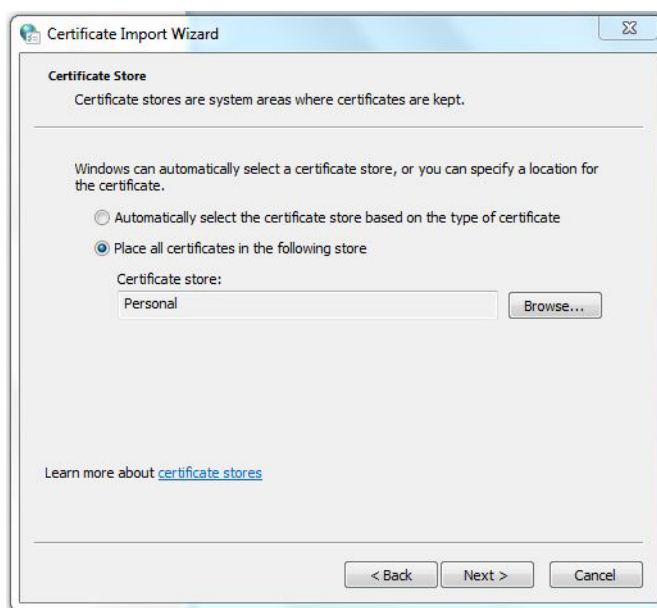


Figure 21. The Certificate Import Wizard

8. Click "Next" and click "Finish".

9. Select the imported certificate in the *Certificates* window and make sure that *Client Authentication* is mentioned under Certificate intended purposes.

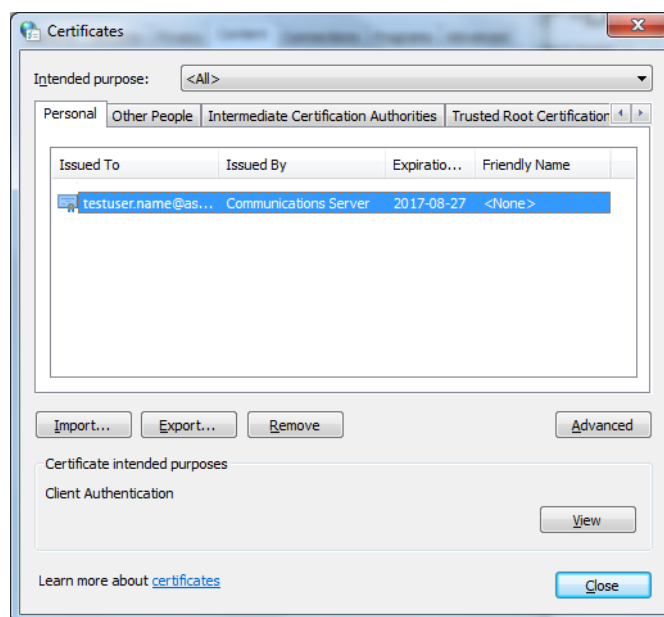


Figure 22. The Certificates window

10. Click "Close".

Appendix F: Used IP Ports

The IP ports are described as inbound ports, with the destination IPBS, IPBL, or IPVM.

Port	Protocol	Source	Description
68	UDP DHCP	Dynamic port	
80	TCP HTTP	Dynamic port	Web configuration over HTTP. Events & Alarms logging.
88	UDP KERBERO S	Dynamic port	
123	UDP NTP	123	
161	UDP SNMP	Dynamic port	
389	TCP LDAP	Dynamic port	Master, Kerberos server.
636	TCP LDAPS	Dynamic port	Master, Kerberos server.
443	TCP HTTPS	Dynamic port	Web configuration over HTTPS. Events & Alarms logging.
464	UDP KERBERO S	Dynamic port	
1716–1717	TCP H.323	Dynamic port	Master
1718–1719	UDP H.225	Dynamic port	Master, Radio Note: UDP session timer minimum 120 s.
1718–1719	TCP H.323	Dynamic port	Radio
1722–1723	TCP H.323	Dynamic port	Master
1724–1727	TCP H.323	Dynamic port	Radio
1728–xxxx (depending on the number of masters)	TCP H.323	Dynamic port	Radio (Multiple Master system). See system description for details
1814–1817	TCP UNITE	Dynamic port	Master messaging.

3217	UDP UNITE	3217	IP-DECT Device Management, Fault Reporting, Service Discovery Note: No UDP session timeout allowed.
5060	UDP/TCP SIP	Dynamic port	Master
5061	TCP SIPS	Dynamic port	Master
12346	TCP UNITE	Dynamic port	Master Portable Device Management
16384–65535	UDP RTP	Dynamic within that range	Radio Media (port range is configurable) Note: No UDP session timeout.

Appendix G: Configure DHCP Options

IPBS/IPBL include a DHCP client which allows the IP interface to be configured from a DHCP server. In addition to that, IPBS/IPBL also allow configuring a number of settings via special DHCP vendor options.

G.1 System Requirements

To use vendor specific DHCP options, a DHCP server that supports such options is required. Most popular DHCP server implementations such as the Microsoft Windows DHCP service and the Linux dhcpd do so.

G.2 Configuration

For the DHCP server to support vendor specific options, the options must be made known to the server. Consult the accompanying documentation which comes with your DHCP server implementation how to do this.

G.3 Supported Options

Name	Data type	Array	Code	Meaning	How to code
H323 gatekeeper	IP address	Yes	200	Defines the IP address of both the primary and the alternate gatekeeper for the device. This is only required, if gatekeeper discovery is not feasible	This is an array of IP addresses. Put the primary gatekeepers IP into the first entry, the alternate gatekeepers IP into the second entry. Further entries are ignored.
H323 gatekeeper id	String	No	201	The gatekeeper id of the gatekeeper the device likes to register with. Usually required only if several gatekeepers are running and a particular one must be chosen during gatekeeper discovery	Type the gatekeeper id as configured in the gateway or PBX configuration into the string field.

POSIX TZ	String	No	202	Defines both the time zone and the daylight saving time information.	This option is in fact identical to the standard DHCP option number 88 (TZ). However, various DHCP servers do not support this option, so it is provided as a redundant vendor specific option. If your DHCP server supports option 88, the vendor specific option is not needed.
Default coder	String	No	203	Defines the preferred coders for H.245 coder negotiation, as well as the packet size when sending RTP packets and the use of CNG and VAD.	This string option must contain the value of the “/ coder” option in the configuration file, e.g. G729A,40,esx . Additional options are: e - Exclusive, s - Silence Compression, x - Enable Secure RTP (SRTP), n - No DTMF Detection.
VLAN ID	Word (16bit)	No	206	The 802.1q VLAN ID for traffic sent and received by the device	Enter the numerical ID into the 16bit edit field
VLAN Priority	Byte (8bit)	No	207	The 802.1p VLAN priority for traffic sent by the device	Enter the numerical priority into the 8bit edit field
TOS Bits	String	No	208	The values for the IP TOS/DSCP field in the IP header of UDP-RTP and TCP-signalling packets sent by the device (Bit 0..2 'precedence', bit 3..6 'type of service')	Enter the comma separated numerical priorities into the string field. You may prefix with 0x to specify hexadecimal numbers (or 0 to specify octal numbers). The default for RTP packets is 0xb8 (RFC 3246 - Expedited Forwarding), for signalling packets it is 0x68 (RFC 3246 - Assured Forwarding). 0xb8,0x68 for example defines the default values
Enbloc dialling	Byte (8bit)	No	209	The number of seconds dialled digits are kept in IP-DECT before they are sent en-bloc to the gatekeeper	Enter the number of seconds into the 8bit edit field. A value of 0 indicates that en-bloc dialling is turned off and digits are sent to the gatekeeper as they are dialled

Dialtone type	Byte (8bit)	No	210	The type of dialtone to generate locally	Enter the numeric dialtone type (0 - EUROPE-PBX, 1 - EUROPE-PUBLIC, 2 - US, 3 - UK, 4 - ITALY-PUBLIC, 5 - CZECH-PBX, 6 - CZECH-PUBLIC, 7 - SWEDEN, 8 - FRANCE, 9 - SWISS, 10 - ITALY-PBX, 11 - BELGIUM, 12 - NETHERLANDS, 13 - NORWAY, 14 - DENMARK, 15 - GERMANY, 16 - SPAIN, 17 - FINLAND, 18 - AUSTRIA, 19 - IRELAND, 20 - AUSTRALIA, 21 - NEWZEALAND, 22 - MALAYSIA, 23 - TURKEY, 24 - RUSSIA, 25 - SOUTH AFRICA, 26 - BRAZIL)
Faststart	Byte (8bit)	No	211	Disable/Enable the H245 faststart procedure	To disable enter 0 , otherwise enter 1 into the 8bit edit field
H245-Tunneling	Byte (8bit)	No	212	Disable/Enable H245 tunneling	To disable enter 0 , otherwise enter 1 into the 8bit edit field
Update URL	String	No	215	URL to retrieve update commands from. This is identical to the /url option parameter of the UP1 module	Complete URL as in http://192.168.0.10/file.txt . No symbolic host names are supported
Update Poll Interval	Word (16bit)	No	216	Standard poll interval in minutes. This is identical to the /poll option parameter of the UP1 module	Interval in minutes

G.4 Disabling the DHCP Client

In certain circumstances, it is convenient to partly disable the DHCP client. This way, the device still gets its IP address from the DHCP server, however, additional settings possibly supplied by the DHCP server are ignored. This is especially useful if in a given setup, some devices are to be configured differently but the majority is still configured by DHCP.

This can be achieved using the following config file options:

config change UP1 /no-dhcp	The update server uses the config files configuration even though there is a configuration supplied from DHCP (innovaphone vendor options "Update URL [215]" and "Update Poll Interval [216]" are ignored).
config change DHCPn /no-vlan	The VLAN settings use the config files configuration even though there is a configuration supplied from DHCP (innovaphone vendor options "VLAN ID [206]" and "VLAN Priority [207]" are ignored).
config change DHCPn /no-vendor	All vendor options are ignored.

G.5 Known Problems with Lengthy Options

The minimum space available for options in a BOOTP/DHCP record is 312 byte. There are some extension mechanisms but only a few DHCP servers support it. The Windows 2000 DHCP server for example does not, but silently truncates options not fitting in this 312 byte space.

G.6 Known Problems with VLAN Configurations

The handling of the 802.1q VLAN ID is a bit tricky. If not hard configured otherwise, the device will request a DHCP lease using the Ethernet switch ports default VLAN ID (that is, it will not send any VLAN header). It will thus receive a DHCP offer dedicated to devices on that VLAN. If this offer includes a VLAN ID option, the device will not accept the offered lease, set the VLAN ID to the value received in the otherwise disregarded offer and start the DHCP process all over again. Now, the DHCP request will be issued on a new VLAN ID. Therefore, the DHCP server will now send an offer dedicated for devices on that new VLAN. This will most probably be a different DHCP scope.

As a consequence, DHCP options on a non-default VLAN must be configured twice. The VLAN ID option itself must be configured in the default VLANs DHCP scope. All other options must be configured in the new VLANs DHCP scope.

Be sure to configure the VLAN in both scopes identically. If not, the DHCP client process will never terminate, since it will always detect a changed VLAN ID, set the VLAN ID and restart the DHCP process.

Here is how DHCP leases are handled in detail:

First boot

The client will broadcast a DHCP DISCOVER, expecting an OFFER from the server including all requested parameters. If the client intends to use the offered lease, it will issue a request for the offered lease. Once it receives an ACK for the lease requested, it will configure itself accordingly. All lease information is stored in the devices config file using the /laddr option (unless suppressed using /no-keep).

Re-boot

If there is lease information (in the /laddr config file option), the client will broadcast requests for the same lease again. If there is no answer within 30 seconds, the device will configure itself using the parameters in /laddr. It will nevertheless continue to request this lease from the DHCP server again (every 30 seconds, a broadcast will be sent).

If the server acknowledges the old lease, the client will check for changes in the DHCP options and re-configure itself accordingly. Changed options will be saved in the config file.

If the server rejects the lease using a NAK, the client will forget about the lease and continue to operate like it does for the first boot.

First boot with VLAN ID option received

If an offered lease includes the VLAN-ID option and the ID proposed differs from the VLAN ID the device currently operates with (that is, from the ID configured in the device's configuration), the device will change its VLAN ID to the one received in the VLAN-ID option. It will not request the lease though. Instead, it will continue to send DISCOVER requests on the new VLAN ID. If a lease is obtained there, all lease information is stored in the config file as usual.

You can disable the VLAN-ID processing using the /no-vlan option.

Reboot with VLAN ID

If the device finds lease information in the config file at boot time and if there is a VLAN ID different from the device's current VLAN-ID, it will re-configure itself to the new VLAN ID and try to request the saved lease as usual. If the lease is rejected with a NAK by the server, the device will re-configure itself to the pre-configured VLAN ID and try to DISCOVER a new lease as usual.

G.7 VLAN set with LLDP

From version 7.1.X, VLAN is also set with LLDP if provided by the switch. See [Configuring VLAN](#) on page 113.

G.8 Changing Configuration Options set by DHCP Options

If a device has been configured by DHCP, those parameters cannot be changed. Any attempt to do so will issue a "Reset required" message.

