System Description
Ascom IP-DECT System

28 October 2011 / Ver. L

Contents

1 Introduction

This document gives a general description of the Ascom IP-DECT system, an IP based cordless telephony and messaging system for connection to private telephone exchanges.

The Ascom IP-DECT system supports the DECT standard which gives a full integration of messaging and voice functions. The Ascom IP-DECT system can be integrated with external applications such as different alarm systems, networks and e-mail. This gives features such as; messages to handset, alarm from handset, message acknowledgement, and absent handling.

1.1 Abbreviations

DECT	Digital Enhanced Cordless Telecommunications: global standard for cordless telecommunication.
HDB	Home location DataBase
IMS3	Integrated Message Server: Unite module that enables messaging to and from the connected cordless telephone system.
Unite CM	Unite Connectivity Manager. Unite module used for messaging and alarm handling. It is also used for the administration of users and groups, for supervision, activity logging and fault logging.
IP	Internet Protocol: global standard that defines how to send data from one computer to another through the Internet
IPBS	IP-DECT Base Station
IPBL	IP-DECT Gateway
ISDN	Integrated Services Digital Network
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.
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RAS	Registration, Admission, Status (H.323)
RFP	Radio Fixed Part. DECT base station part of the DECT Infrastructure. TDM-DECT base station connected to an IPBL or the local RFP part in an IPBS.
SIP	Session Initiation Protocol
Unite	Generic term for messaging system that unites different systems, for example System 900, System 9d, and teleCARE M.
VoIP	Voice over Internet Protocol

1.2 Glossary

Roaming	The procedure of moving the handset from one IPBS/IPBL to another and still be able to place outgoing and receive incoming calls.
External Handover	The procedure of moving an active call from one IPBS/IPBL to another.
System ID	System ID in the Pari Master defines the sync domain and handover domain. Within the coverage area, the System ID must be unique from other Ascom IP-DECT systems.
Master ID	Master ID must be unique for each Master in a system. The Standby Master must have the same id as the Master.
RFPI	The RFPI, Radio Fixed Part Identity, is the broadcast identity which uniquely identifies a RFP geographically.
Cover Radius	The radius of the circle (circular radiation patterns of the base station antennas are assumed), around a particular base station, in which portable parts can communicate with that base station.
Sync Radius	The radius of the circle, around a particular base station, in which other Base Stations may synchronize with that Base Station.
Sync Coverage	A sync coverage is the air sync coverage areas for all base stations connected to the same sync Master.
Sync Domain	Sync domain defines the Radios to which automatic synchronization is allowed. Sync domain is defined by the System ID.
Handover Domain	Handover domain defines the Radios to which external handover is allowed. Handover domain is defined by the System ID.

2 Ascom IP-DECT System Overview

The Ascom IP-DECT system is modular. It is designed for small installations as well as large multi-site installations with remote offices.

The Ascom IP-DECT system is built up by the following components:

- Handsets
- IP-DECT Base Station (IPBS)
- IP-DECT Gateway (IPBL)
- Radio Fixed Part (RFP)
- IP-PBX
- Integrated Message Server (IMS3)
- Unite Connectivity Manager (Unite CM)
- Unite System

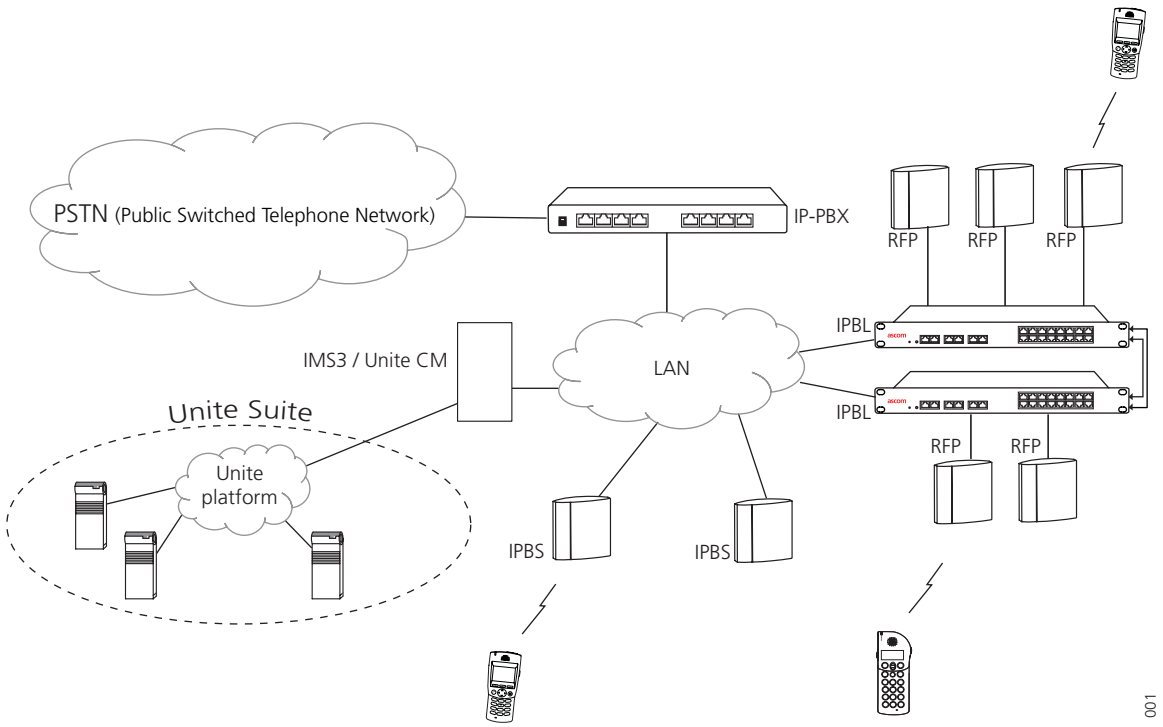

Figure 1. Ascom IP-DECT System Overview

2.1 System Size

The Ascom IP-DECT system is very modular and scalable. Systems for more than 100 000 users can be built.

2.2 System Components

2.2.1 Handsets

The Ascom IP-DECT system has support for all Ascom DECT handsets. No changes of the handset is needed.

2.2.2 IPBS

The IPBS has eight channels used for speech, message and alarm. The IPBS also has one channel which is reserved for messaging and alarm.

2.2.3 IPBL

Up to 16 RFPs can be connected to the IPBL. The IPBL has eight channels for each RFP used for speech, message and alarm. The IPBL also has two channels which are reserved for messaging and alarm. Totally the IPBL has 40 speech channels.

2.2.4 RFP

All Ascom TDM-DECT base stations can be connected to the IPBL.

2.2.5 IP-PBX

The Ascom IP-DECT system is connected to the IP-PBX with standardized H.323 or SIP protocol.

2.2.6 Integrated Message Server (IMS3)

The IMS3 contains support for messaging and alarm and connects the Ascom IP-DECT system to the Unite platform.

The IMS3 contains also a Device Manager which supports parameter and software download to handsets. For more information, see the Unite documentation.

All features are license dependent.

2.2.7 Unite Connectivity Manager (Unite CM)

The Unite CM contains support for messaging and alarm and connects the Ascom IP-DECT system to the Unite platform.

Depending on the version of the Unite CM it might also contains a Device Manager which supports parameter and software download to handsets. For more information, see the Unite documentation.

All features are license dependent.

2.2.8 FXO

The FXO is a device that is used as an interface between the Ascom IP-DECT system an analogue PBX. For more information about FXO, see *Configuration Notes for FXO in Ascom IP-DECT System*, *TD 92529GB*.

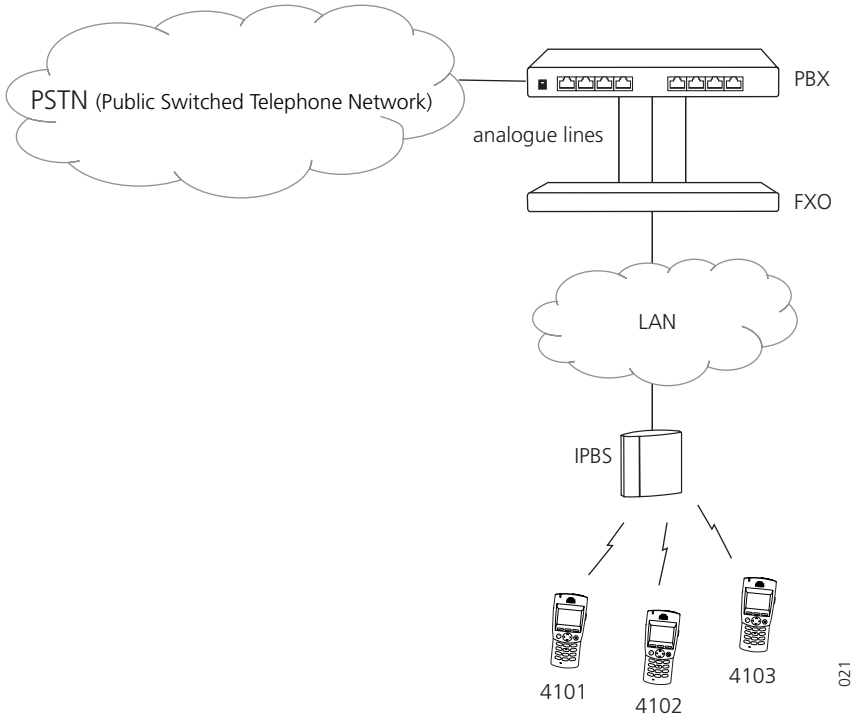

Figure 2. Ascom *IP-DECT system connected to a analog PBX via FXO.*

2.3 System Functions

The Ascom IP-DECT system is designed to enable voice traffic, messaging and alarm handling between handsets within an enterprise LAN. The Ascom IP-DECT system supports roaming and handover between all IPBSs and IPBLs in the system.

2.4 LAN/WAN

There are several vendors providing components needed to deploy a LAN/WAN. In order to achieve optimal performance for IP-DECT the following is recommended:

- Quality of Service (QoS)
- The infrastructure should be connected to a switched network. (i.e hubs or repeaters should be avoided)
- Depending on network size, a backbone of least 100 Mbps should be used.

2.5 Supported third-party functions

The Ascom developed products are designed to work in system provided by different vendors.

3 Ascom IP-DECT System

The Ascom IP-DECT system is connected via one or several IP-PBXs to the PSTN. For messaging purposes the Ascom IP-DECT system can be connected to one or several Integrated Message Servers (IMS3) or Unite Connectivity Managers (Unite CM), see 3.4 *Messaging in Multiple Master Systems* on page 17.

The Ascom IP-DECT system have a modular structure that can be modelled as a number of network entities. The network entities defined are:

- the entity offering the H323-DECT gateway functionality will be referred to as **Radio**
- the entity acting as the proxy for the IP terminated DECT handsets within the coverage of the associated Radios will be referred to as **Master**
- the entity offering support for finding home location information will be referred to as **Mobility Master**
- the entity offering support for distribution of the DECT identity RFPI will be referred to as **Pari Master**

3.1 Software Components

An Multiple Master system consists of the following entities which are software components which can be activated in an IPBS and IPBL:

- Radio
- Master
- Pari Master
- Mobility Master

For information on how to set these software components, see *Installation and Operation Manual for IP-DECT Base Station and IP-DECT Gateway*.

3.1.1 Pari Master

This software component is responsible for assigning RFPIs, being part of the same external handover domain, to the Radios associated. A Radio will always be given the same RFPI, based on the RFPI-mac-address association.

3.1.2 Mobility Master

The Mobility Master will establish a RAS channel to any associated Mobility Masters, for which roaming agreements has been configured. This ensures scalability to a world wide level by distributing the home location master information to local Radios and remote Mobility Masters in the system.

3.1.3 Master

This software component is responsible for the communication to the IP-PBX. Translation between the internal H.323 to the DECT Radios and the external protocol (H.323 / SIP) to the IP-PBX is done by this component.

A Master is responsible for the DECT handsets that are assigned to it. When the Master has been notified about that a handset is within coverage it makes a registration to the IP-PBX. This registration is maintained by the Master until a notification is received that the handsets access rights has been terminated or the handset has detached. At startup the registration is done only for the handsets that notifies itself with the location registration message.

The Master will establish a RAS channel to any associated Mobility Master at startup. All DECT handsets in the HDB are sent to the Mobility Master, to be used in the home location master resolution process.

The Master is also responsible for the mapping of keypad information to supplementary PBX features. Some features are handled locally by the Master and some are communicated to the IP-PBX.

3.1.4 Radio

The Radio is a software interface between DECT and H323.

Location registration requests that cannot be resolved locally are forwarded to the Master acting as Pari Master. If the handset cannot be resolved locally in the Pari Master, the Mobility Master needs to be involved in the process of resolving the home location master, as it has knowledge of all DECT handsets in the system. The RAS channel will be established by the Radio for the first handset assigned to a Master and maintained until the last handset assigned to this Master has left the Radio. Thus, the Radio may have several concurrent RAS channels established to different Masters. Information for authentication of the handset will be sent by the home location master to the Radio.

3.2 System Layout

This section describes examples of different system layout sizes:

- One Master systems, see 3.2.1 *One Master Systems* on page 8.
- Multiple Master systems, see 3.2.2 *Multiple Master Systems* on page 10.
- Multiple Mobility Master systems, see 3.2.3 *Multiple Mobility Master Systems* on page 15.

3.2.1 One Master Systems

Single site installation

See figure 3.

The system capacity for this layout is:

- Up to 1000 users (Note: Up to 500 users if SIP over TLS is used.)
- When the number of system IDs used in the installation is between 1 to 36:
  Max. 1023 IPBS / Pari Master
  Max. 240 IPBL / Pari Master
- When the number of system IDs used in the installation is between 37 to 292:
  Max. 127 IPBS / Pari Master
  Max. 127 IPBL / Pari Master

This layout may be used for customers with a single site installation.

The lines displayed between IP-PBX, Master and Radios are only used to indicate the logical connection between the software modules.

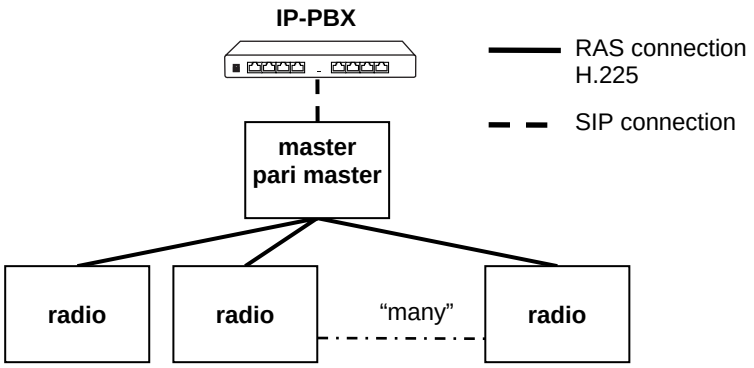

Figure 3. Example of a single site installation

The figure 4 below shows the software components. An IPBS/IPBL includes all software components as described in 3.1 *Software Components* on page 6.

In a single site installation, one of the IPBSs/IPBLs will have an active Master and Pari Master software component, and optionally have an active Radio. All others will only have the software component Radio active.

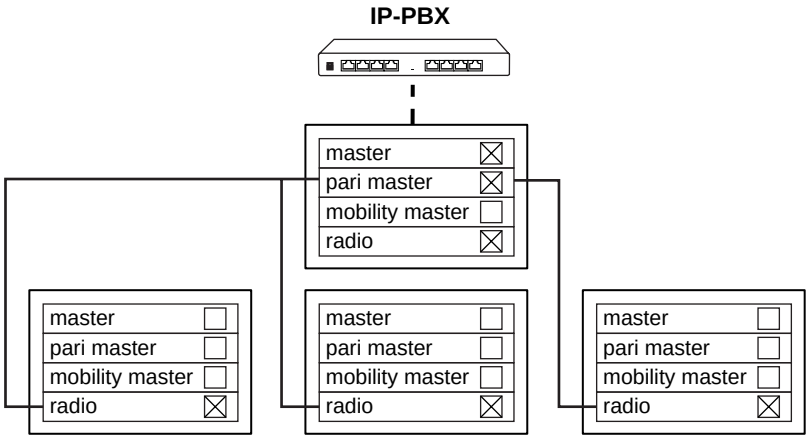

Figure 4. Distribution of software components

Multiple site installation

See figure 5.

The system capacity for this layout is:

- Up to 1000 users (Note: Up to 500 users if SIP over TLS is used.)
- When the number of system IDs used in the installation is between 1 to 36:
  Max. 1023 IPBS / Pari Master
  Max. 240 IPBL / Pari Master
- When the number of system IDs used in the installation is between 37 to 292:
  Max. 127 IPBS / Pari Master
  Max. 127 IPBL / Pari Master

This layout is chosen if there is no need for local functionality in remote sites.

The same layout as in a single site can also be used for customers with an installation on several sites. The sites may have one or several IPBS/IPBL at each site. The IP-PBX and the Pari Master and Master are centrally located.

With this solution the handset will be able to roam to a different site and it will be possible to receive incoming and make outgoing calls.

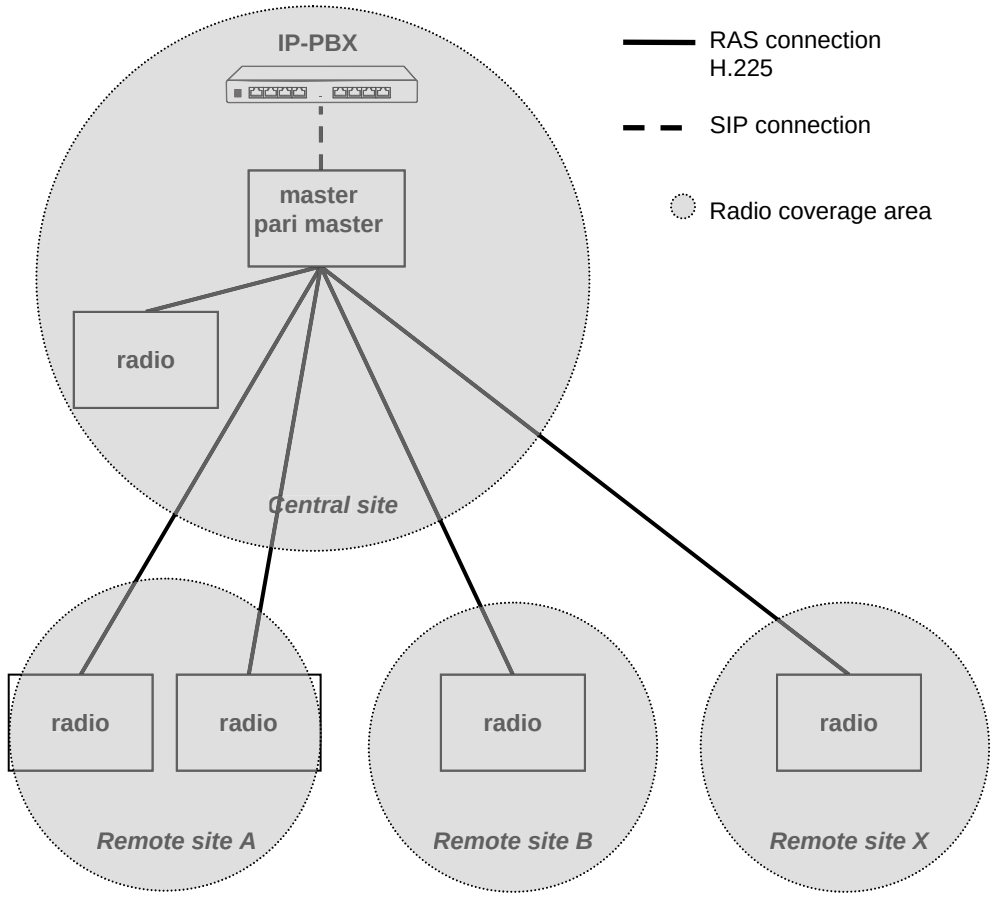

Figure 5. Multiple site installation

3.2.2 Multiple Master Systems

Single site installation

See figure 6.

The system capacity for this layout is:

- Up to 1000 users / Master (Note: Up to 500 users / Master if SIP over TLS is used.)
- When the number of system IDs used in the installation is between 1 to 36:
  Max. 1023 IPBS / Pari Master
  Max. 240 IPBL / Pari Master
- When the number of system IDs used in the installation is between 37 to 292:
  Max. 127 IPBS / Pari Master
  Max. 127 IPBL / Pari Master
- Max. 100 Masters / Mobility Master

This layout may be used for customers with a large single site installation. Load must be distributed over a number of Masters to be able to cope with the load generated from a large number of handsets. It will be possible to do roaming and handover between all Radios.

The lines displayed between IP-PBX, Mobility Master, Master and Radios are only used to indicate the logical connection between the software modules.

Several Masters are logically connected directly to one or several IP-PBXs.

A Master makes SIP registrations to the IP-PBX for the respective handsets within coverage. After registration of a Master to the IP-PBX for a handset, all in- and outgoing speech calls will be routed directly to this Master.

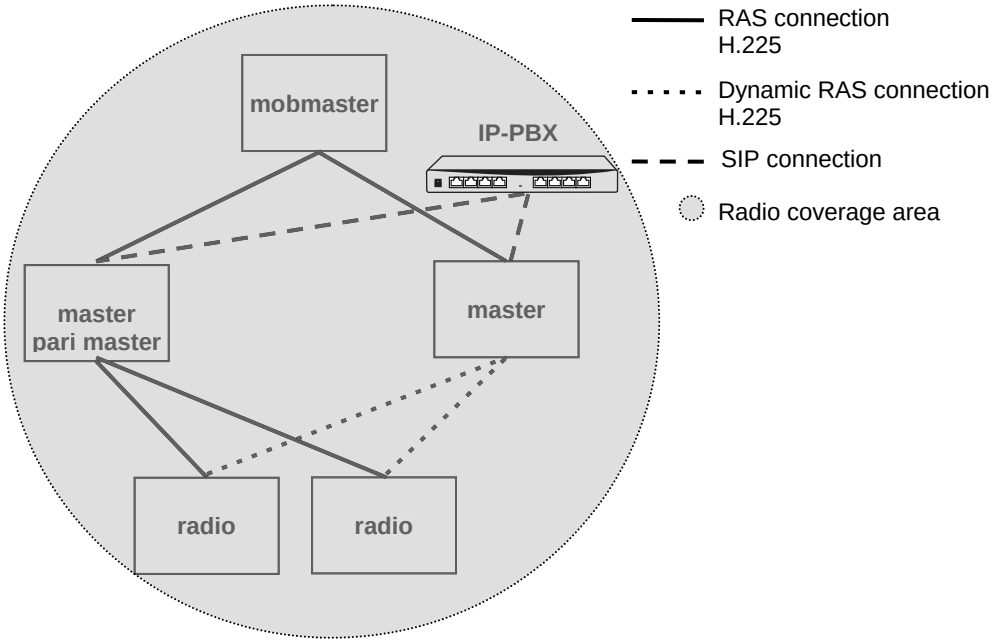

Figure 6. Single site installation

The figure 7 below shows the software components. An IPBS/IPBL includes all software components as described in 3.1 *Software Components* on page 6.

In a single site installation one or several of the IPBS/IPBL will have an active Master software component, only one of the Masters will have an active Pari Master, and one IPBS/IPBL will have an active Mobility Master software component, and optionally have an active Radio. All others will only have the software component Radio active.

In a single site installation, one or several of the IPBS/IPBL will have an active Master software component and optionally have an active Radio. All others will only have the software component Radio active.

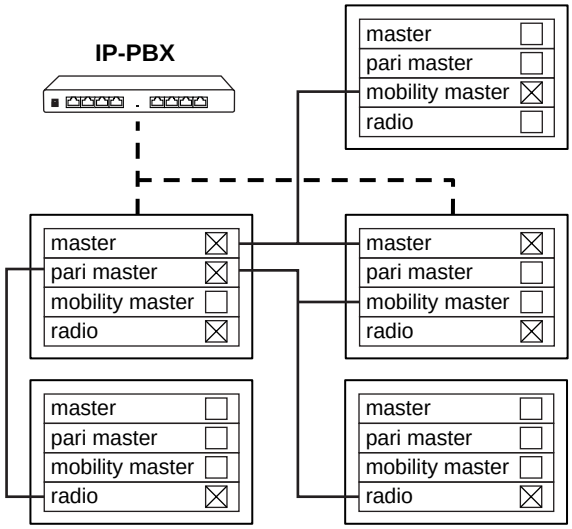

Figure 7. Distribution of software components

Multiple site installation

See figure 8.

The system capacity for this layout is:

- Up to 1000 users / Master (Note: Up to 500 users / Master if SIP over TLS is used.)
- When the number of system IDs used in the installation is between 1 to 36:
  Max. 1023 IPBS / Pari Master
  Max. 240 IPBL / Pari Master
- When the number of system IDs used in the installation is between 37 to 292:
  Max. 127 IPBS / Pari Master
  Max. 127 IPBL / Pari Master
- Max. 100 Masters / Mobility Master

This layout is chosen if there is no need for local functionality in remote sites.

The same layout as in a single site can also be used for customers with an installation on several sites. The sites may have one or several base stations at each site. The IP-PBX and the Pari Master and Master are centrally located.

With this solution the handsets will be able to roam to a different site and it will be possible to receive incoming and make outgoing calls.

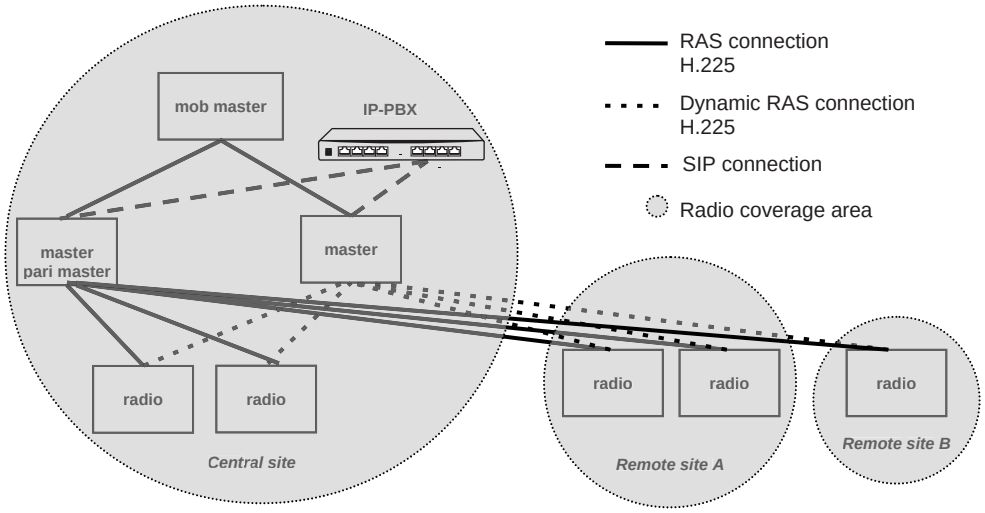

Figure 8. Multiple site installation with central Master

Multiple site installation with local functionality

See figure 9. The system capacity for this layout is:

- Up to 1000 users / Master (Note: Up to 500 users / Master if SIP over TLS is used.)
- When the number of system IDs used in the installation is between 1 to 36:
  Max. 1023 IPBS / Pari Master
  Max. 240 IPBL / Pari Master
- When the number of system IDs used in the installation is between 37 to 292:
  Max. 127 IPBS / Pari Master
  Max. 127 IPBL / Pari Master
- Max. 100 Masters / Mobility Master

This layout is chosen if there is a need for local functionality in remote sites.

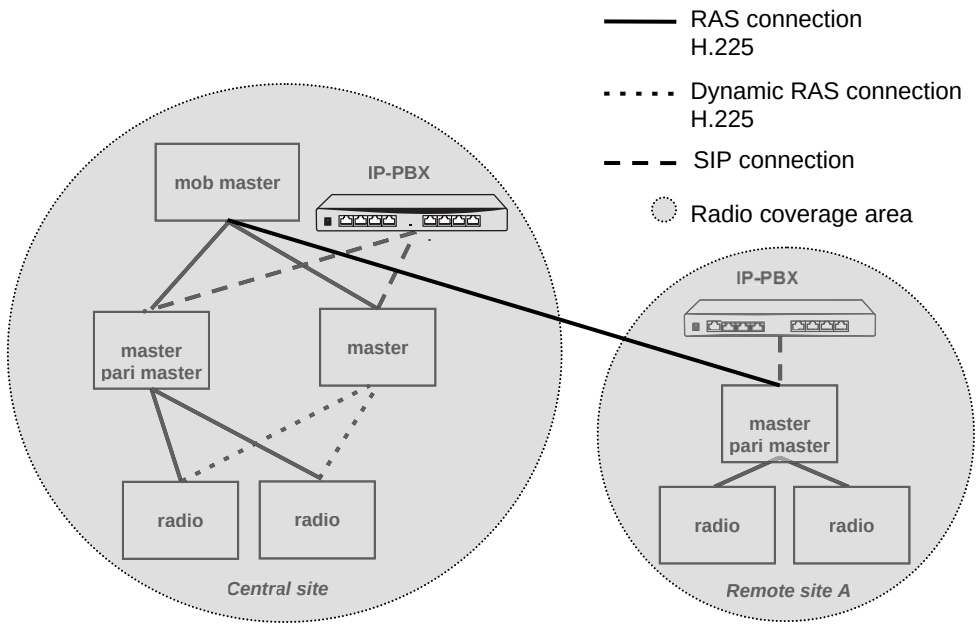

Figure 9. Multiple site installation with remote Master

The figure 10 below shows the software components. An IPBS/IPBL includes all software components as described in 3.1 *Software Components* on page 6.

In site A, one of the IPBS/IPBL will have an active Master and Pari Master software component, and optionally have an active Radio. All others will only have the software component Radio active, see figure 9.

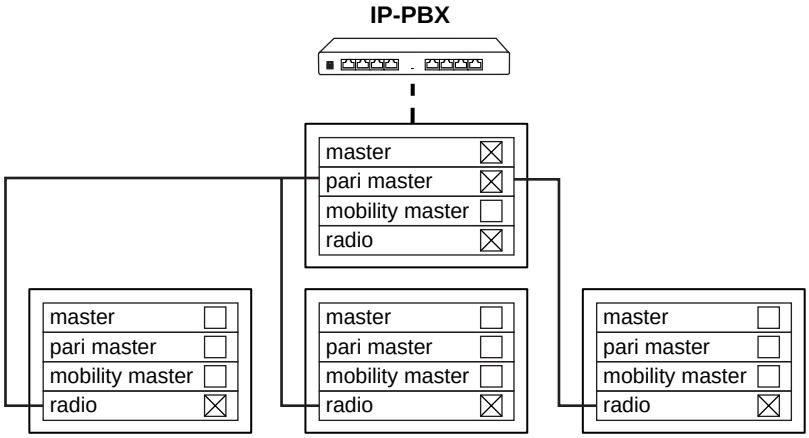

Figure 10. Distribution of software components in remote site A.

3.2.3 Multiple Mobility Master Systems

See figure 11. The system capacity for this layout is:

- Up to 1000 users / Master (Note: Up to 500 users / Master if SIP over TLS is used.)
- Max. 10 Mobility Masters / System
- When the number of system IDs used in the installation is between 1 to 36:
  Max. 1023 IPBS / Pari Master
  Max. 240 IPBL / Pari Master
- When the number of system IDs used in the installation is between 37 to 292:
  Max. 127 IPBS / Pari Master
  Max. 127 IPBL / Pari Master
- Max. 100 Masters / Mobility Master

This layout is chosen if there is a need for local functionality in a site with several Masters. This layout may be used for customers with large multiple site installations. Load must be distributed over a number of Masters to be able to cope with the load generated from a large number of handsets in one site. It will be possible to do roaming and handover between all Radios within each site. It will be possible to do roaming to all other sites to which roaming agreements exists and it will be possible to receive incoming and make outgoing calls.

The lines displayed between IP-PBX, Mobility Master, Master and Radios are only used to indicate the logical connection between the software modules.

A system can consist of several Masters where each Master is logically connected to a specific IP-PBX.

A Master dynamically makes SIP registrations to the "home" IP-PBX for each of the handsets within its coverage. After registration of a Master to the IP-PBX for a handset, all in- and outgoing speech calls will be routed directly to this Master.

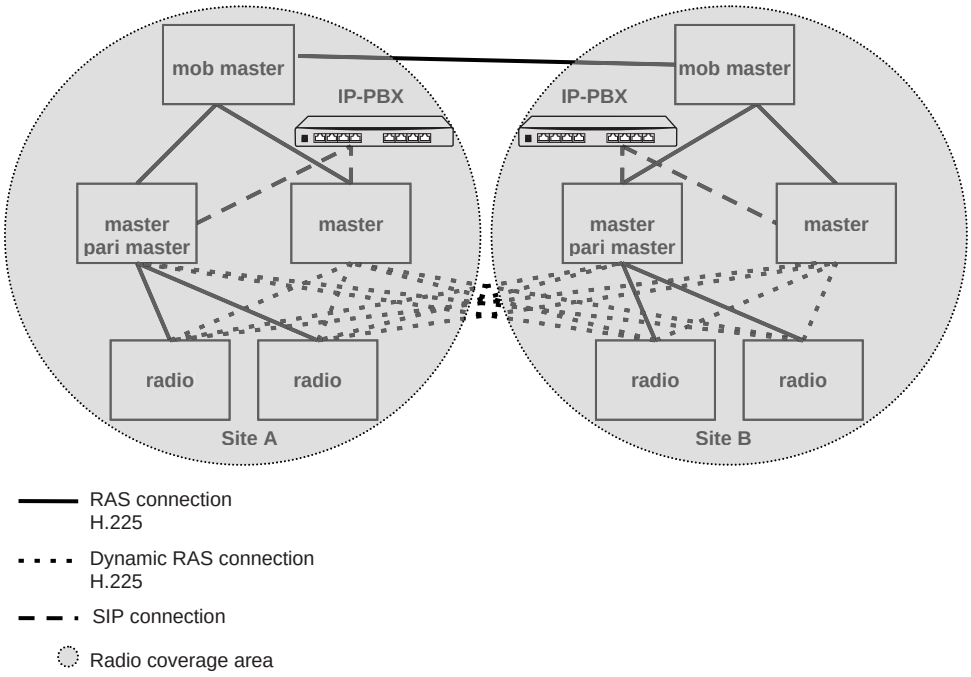

Figure 11. Multiple site installation

The figure 12 below shows the software components. An IPBS/IPBL includes all software components as described in 3.1 *Software Components* on page 6.

In each site one or several of the IPBS/IPBL will have an active Master software component, only one of the Masters will have an active Pari Master, and one IPBS/IPBL will have an active Mobility Master software component, and optionally have an active Radio. All others will only have the software component Radio active.

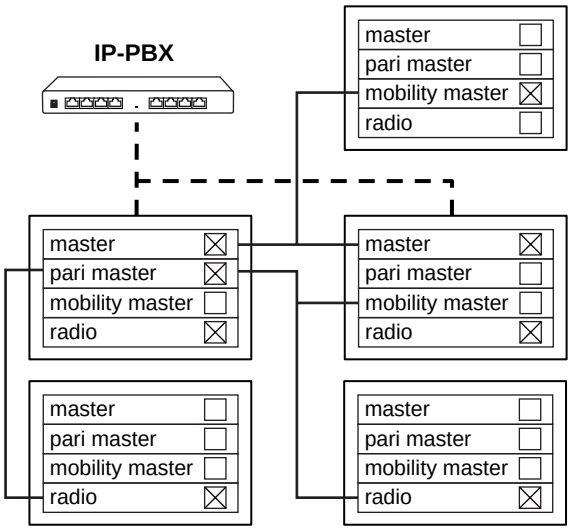

Figure 12. Distribution of software components in site A and B.

3.3 Standby Devices

It is recommended to have Standby devices in an IP-DECT system. Depending on how the IP-DECT system is configured, standby devices can be Standby Master, Standby Pari Master, Standby Mobility Master. When a Master goes down the corresponding Standby Master takes over.

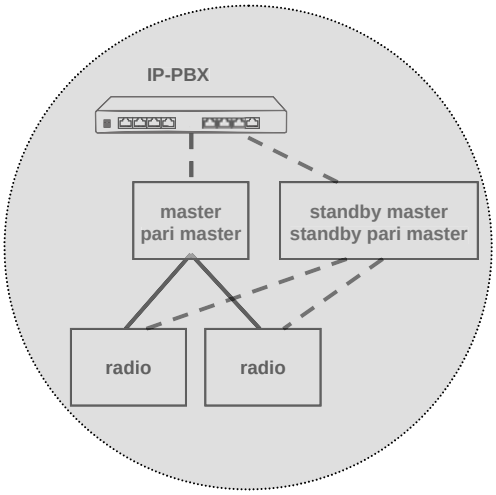

Figure 13. An Ascom IP-DECT system with a Standby Pari Master.

3.4 Messaging in Multiple Master Systems

For messaging purposes the Ascom IP-DECT system can be connected to one or several Integrated Message Servers (IMS3) or Unite Connectivity Managers (Unite CM). To have messaging functionality for all handsets in a multiple Master system, each Master with handsets assigned must have a connection to an IMS3 or Unite CM.

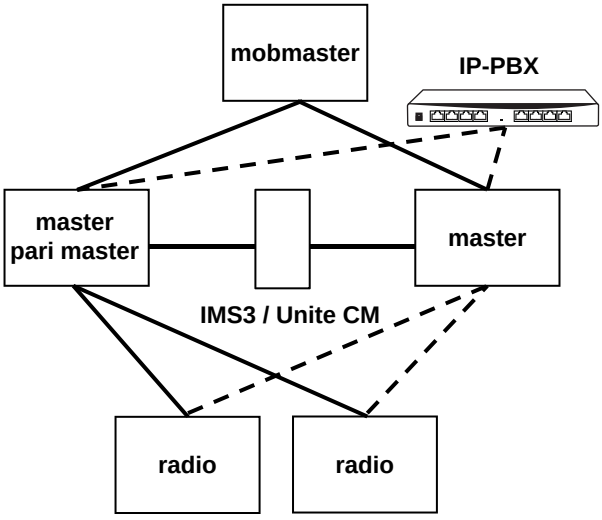

Figure 14. Messaging in multiple Master systems.

3.5 Broadcast Messaging in Multiple Master Systems

Message with broadcast (e.g. fire alarm) must be sent via an IMS3 or Unite CM connected to the Pari Master since the Pari Master is the only Master that is always connected to all Radios. The message will then be transmitted to all Radios that are connected to the Pari Master. All users, not only the handsets assigned to the Pari Master, within the coverage area will receive the message.

3.6 Multicast Messaging in Multiple Master Systems

Multicast groups are configured in the Enhanced System Services (ESS) Unite module. Message with multicast (e.g. fire alarm) must be sent via an IMS3 connected to the Pari Master since the Pari Master is the only Master that is always connected to all Radios. The message will then be transmitted to all Radios that are connected to the Pari Master.

Users that are members of multicast groups must be located/configured on the Pari Master. The users will only receive Multicast messages within its Pari Master domain.

3.7 Device Management

Note: The Unite CM support for the below functions is depending on the Unite CM software version.

A Device Manager (included in the IMS3/Unite CM) is an application for managing handsets and chargers in wireless systems. The Device Manager can be connected to one or several Masters. It is also possible to have several Device Managers in the Ascom IP-DECT system.

The Device Manager supports software downloads to handsets. The table below shows approximately download times for DECT handsets d41 and d62 when done over-the-air.

	IPBS	***IPBL***
d41	approx. 17 min.	approx. 102 min.
d62	approx. 25 min.	approx. 189 min.

The software downloads capacity is depending on call traffic in the following way:

IPBS: 0-4 simultaneous downloads depending on call traffic, see below.

Number of calls	*Number of possible simultaneous downloads*
0	4
1	3
2	2
3	1
4 or more	0

IPBL: 0-4 simultaneous downloads depending on call traffic. Same limitations as for IPBS, see above.

IMS3/Unite CM: Max. 10 simultaneous downloads (max. 20 when using an external web server).

There are a number of factors that affect the software download time:

- The number of base stations.
- The number of handsets per base station.

- How much the handsets are moving between the base stations. When moving between RFPs there will be a 1-2 minute break in the software download.
- Speech calls will delay the software download.

3.8 Fault Reporting

Faults that occur in the Ascom IP-DECT system are shown locally in the faulty IPBS/IPBL. The faults can be forwarded to a central point (the Master) in the Ascom IP-DECT system. The faults can also be forwarded to the Ascom's Messaging system and to an external SNMP manager.

3.9 Load Balancing

Load balancing can be used in an Ascom IP-DECT system when the number of handsets exceeds what an IP-PBX is able to register.

When load balancing, the traffic is distributed over several IP-PBXs which can be done in two ways using:

- fixed connections for users on each Master towards *multiple* IP-PBXs.
- dynamic connection for users on each Master towards IP-PBX *network* using DNS services.

For more information about load balancing, see *Installation and Operation Manual for IP-DECT Base Station and IP-DECT Gateway*.

3.10 Synchronization

Synchronization within the Ascom IP-DECT system is done with the following methods:

- Air synchronization (IPBS)
- Ring synchronization (IPBL)
- Air and ring synchronization combined

3.10.1 Air Synchronization

If the planned system shall have IPBS base stations, both speech coverage and air sync coverage have to be considered. If the system only consists of TDM-DECT base stations, only speech coverage has to be considered.

Speech coverage: the radius of the circle (circular radiation patterns of the IPBS antennas are assumed for reasons of simplicity), around a particular IPBS, in which portable parts can communicate with that IPBS, see figure 15.

Sync coverage: the radius of the circle, around a particular IPBS, in which other IPBSs can synchronize with that IPBS with a given synchronization loss probability. This means that the size of the sync radius depends on requested probability of losing synchronization, see figure 15.

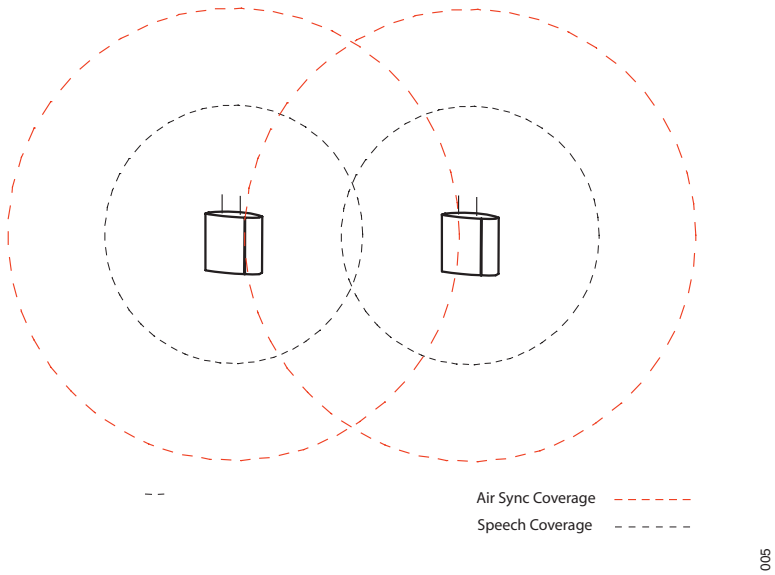

Figure 15. Air- and speech sync radius.

3.10.2 Ring Synchronization

Each synchronization port sends and receives synchronization signals. Each IPBL has two ports (in/out) for ring synchronization and two ports (in/out) for reference synchronization.

The ring synchronization can be made in two different ways:

- Redundant (preferred)
- Non redundant

Each synchronization ring dynamically assigns a sync master.

3.11 Channel Distribution

When a handset is used for speech, message, or alarm it always occupies one channel. However, when a handset is used for speech it can send or receive a message or an alarm on the same channel.

3.11.1 BS3x0 Connected to the IPBL

The BS3x0 that is connected to the IPBL has in total twelve channels. One channel is reserved for broadcast messages. Alarm from handset can occupy eleven channels. Messages to/from handsets can occupy ten channels but only eight speech calls can be handled simultaneous, see figure 16.

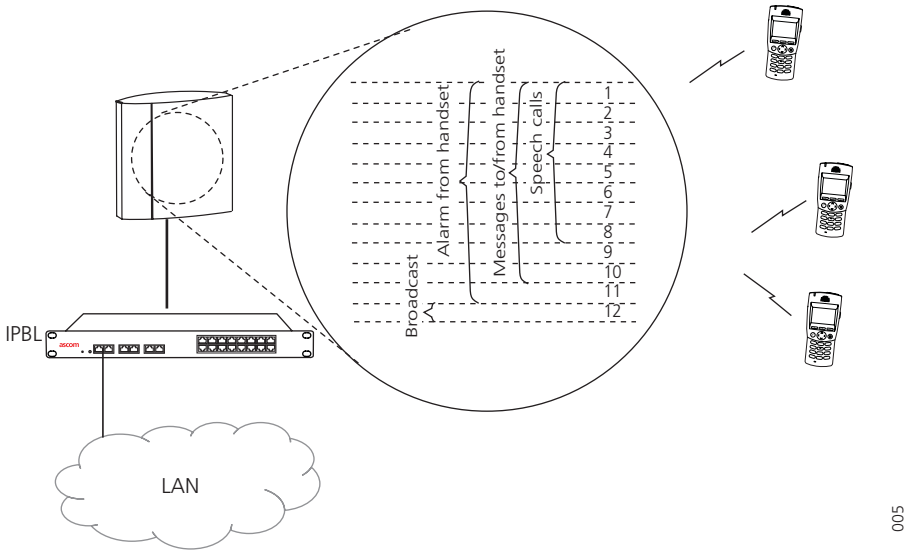

Figure 16. Channel distribution in the BS3x0 connected to the IPBL.

This means that even if a BS3x0 reports that it is busy i.e. fully occupied with speech calls and/or messaging, there are always channels free for alarm from handset and broadcast messages.

3.11.2 IPBS

The IPBS has in total twelve channels. One channel is reserved for broadcast messages and two channels are reserved for synchronization. Alarm from handset can occupy nine channels but only eight speech and/or messaging can be handled simultaneously, see figure 17.

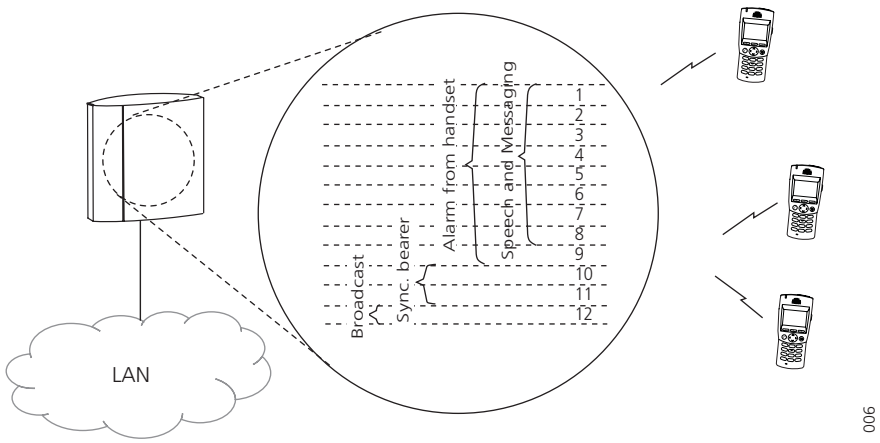

Figure 17. Channel distribution in the IPBS.

This means that even if a IPBS reports that it is busy i.e. fully occupied with speech calls and/or messaging, there are always channels free for alarm from handset and broadcast messages.

3.12 Ascom IP-DECT System Management

3.12.1 On Site Management

The IPBS and IPBL are is managed using a web GUI accessed over the LAN.

3.12.2 Remote Management

The IPBS and IPBL can be managed over the Internet using a VPN client.

Remote management is also possible by using the ESS module. For more information, see *Function Description, Remote Management, TD 92257GB*.

3.12.3 IP Administration Security

All IP administration is based on secure IP (HTTPS). All access to the IPBS and IPBL are password protected in order to prevent unauthorised access.

3.12.4 Software Upgrade

The IPBS and IPBL have support for software download and it is possible to do a software upgrade using the web interface. It also has support for automatic firmware update from a web server.

4 VoIP Signalling Protocols

Two of the protocols used for VoIP signalling are H.323 and SIP. H.323 was the first standard and is in fact a set of protocols designed to enable multimedia traffic in single LANs. One protocol of many in the set of protocols defined in H.323, is H.450, which is a series of protocols which defines Supplementary Services for H.323.

Like H.323, SIP can be used for VoIP but while H.323 is ISDN-based (Q. 931 and earlier H series), SIP is text-based. As opposed to H.323 which uses Abstract Syntax Notation number One (ASN.1), SIP encodes its messages as text, similar to HTTP and SMTP.

4.1 H.323

H.323 was developed by the International Telecommunications Union (ITU) and was designed from a telecommunications perspective. Ratified in 1996 it has become a defacto choice for interoperability among VoIP equipment. It is a standard that provides specification for computers, equipment, and services for multimedia communication over networks that do not provide a guaranteed QoS.

H.323 equipment can carry real-time video, audio, and data, or any combination of these elements. Included in the H.323 standard are H.225, H.245 and the IETF protocols RTP and RTCP, with additional protocols for call signalling, data and audiovisual communications.

H.323 products and services offer the following benefits to users:

- Products and services developed by multiple manufacturers under the H.323 standard can interoperate without platform limitations. H.323 conferencing clients, bridges, servers, and gateways support this interoperability.
- H.323 provides multiple audio and video codecs that format data according to the requirements of various networks, using different bit rates, delays, and quality options. Users can choose the codecs that best support their computer and network selections.

4.1.1 H.450 Supplementary Services for H.323

H.450 is a series of protocols which are used to exchange signalling information to control the supplementary services such as, Call Transfer, Call Diversion, Call Waiting etc. over a LAN.

4.2 Session Initiation Protocol (SIP)

SIP is an application layer control (signalling) protocol for creating, modifying, and terminating sessions with one or more participants. These sessions include Internet multimedia conferences, Internet telephone calls and multimedia distribution. SIP is designed as part of the IETF standards.

SIP itself is not sufficient to set up a call and other IETF protocols such as RTP and SDP are required to support a VoIP call. However, the functionality and operation of SIP does not depend on any of these protocols.

5 Related Documents

System Planning, Ascom IP-DECT System	TD 92422EN
Installation and Operation Manual for IP-DECT Base Station and IP-DECT Gateway	TD 92579EN
Configuration Notes for Cisco Call Manager in Ascom IP-DECT System	TD 92424GB
Configuration Notes for Aastra MX-ONE in Ascom IP-DECT System	TD 92637GB
Configuration Notes for Ascom VoIP Gateway in Ascom IP-DECT System	TD 92642GB
Configuration Notes for FXO in Ascom IP-DECT System	TD 92529GB
Data Sheet, IP-DECT Base Station	TD 92370GB
Data Sheet, IP-DECT Base Station (IPBS2)	TD 92836EN
Data Sheet, IP-DECT Gateway	TD 92430GB
Installation and Operation Manual, Integrated Message Server (IMS3)	TD 92762EN
Installation and Operation Manual, Alarm Management Server (AMS)	TD 92047GB
Installation and Operation Manual, Enhanced System Service (ESS)	TD 92253GB
Function Description, Remote Management	TD 92257GB
Data sheet, Integrated Message server (IMS3)	TD 92779EN
Data Sheet, Enhanced System Service (ESS)	TD 92250GB
System Description, Unite	TD 92243GB

Document History

For details in the latest version, see change bars in the document.

Version	Date	Description
A	2006-05-24	First released version.
B	2006-08-15	General improvments.
C	2007-01-15	New document structure.
D	2007-04-20	IP-DECT Gateway added.
E	2007-10-25	• Chapter 3.10.2 *Ring Synchronization* on page 20 updated. • *Appendix A* Messaging Capacity updated.
F	2009-02-02	Major update of the document with the introduction of the Multiple Master system concept.
G	2009-04-15	Added some information about broadcast messaging and device management. Updated Appendix A: Messaging Capacity.
H	2010-03-05	Minor changes.
I	2010-09-24	Updated system capacity figures. Updated Appendix A *Messaging Capacity*. Added information about Multicast.
J	2010-10-22	Updated several figures etc.
K	2011-05-31	3.2.3 *Multiple Mobility Master Systems* on page 15 Updated to 10 Mobility Masters / System.
L	2011-10-28	Some updates, see change bars.

Appendix A: Messaging Capacity

A.1 Alarm Messages from DECT handset

Time until received in the Unite system:	*~ 2 sec*

A.2 No Highspeed Data to DECT handset 9d24

A.2.1 Incoming Messages to DECT handset 9d24 (version 3.0 or later)

The time for a message to be delivered differ dependent on how many characters the message contain and if it is delivered to a single handset or a group of handsets.

Number of message characters:	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **one handset** is paged:*	*For **IPBS**: Time in seconds until **one handset** is paged:*
20 characters	1	*~ 4*	*~ 3*
120 characters	1	*~ 5*	*~ 3*
240 characters	1	*~ 6*	*~ 4*
500 characters	1	*~ 9*	*~ 7*

Number of message characters:	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **all handsets** are paged:*	*For **IPBS**: Time in seconds until **all handsets** are paged:*
20 characters	1 10 30 100	*~ 4* *~ 6* *~ 14* *~ 43*	*~ 3* *~ 4* *~ 11* *~ 32*
120 characters	1 10 30 100	~ 5 *~ 7* *~ 17* *~ 56*	~ 3 *~ 4* *~ 13* *~ 39*

A.2.2 Incoming Messages to DECT handsets in a Broadcast Group

Number of message characters	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **the group** is paged:*	*For **IPBS**: Time in seconds until **the group** is paged:*
20 characters	Unlimited	*~ 4*	*~ 4*
120 characters	Unlimited	*~ 5*	*~ 5*
240 characters	Unlimited	*~ 13*	*~ 13*
500 characters	Unlimited	*~ 31*	*~ 31*

A.2.3 Incoming Messages to DECT handsets in a Multicast Group

Number of message characters	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **the group** is paged (threshold values within parenthesis):*	*For **IPBS**: Time in seconds until **the group** is paged (threshold values within parenthesis):*
20 characters	Unlimited	*~ 4*	*~ 4*
120 characters	Unlimited	*~ 5*	*~ 5*
240 characters	Unlimited	*~ 13*	*~ 13*
500 characters	Unlimited	*~ 31*	*~ 31*

A.3 Highspeed Data to DECT handset d62

A.3.1 Incoming Messages to DECT handset d62

The time for a message to be delivered differ dependent on how many characters the message contain and if it is delivered to a single handset or a group of handsets.

Number of message characters:	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **one handset** is paged:*	*For **IPBS**: Time in seconds until **one handset** is paged:*
20 characters	1	*~ 4*	*~ 3*
120 characters	1	*~ 5*	*~ 3*
240 characters	1	*~ 6*	*~ 3*
500 characters	1	*~ 9*	*~ 3*

Number of message characters:	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **all handsets** are paged:*	*For **IPBS**: Time in seconds until **all handsets** are paged:*
20 characters	1 10 30 100	*~ 4* *~ 6* *~ 14* *~ 43*	*~ 3* *~ 3* *~ 6* *~ 23*

120 characters	1 10 30 100	~ 5 *~ 7* *~ 17* *~ 56*	~ 3 *~ 3* ~ 9 *~ 27*

A.3.2 Incoming Messages to DECT handsets in a Broadcast Group

Number of message characters	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **the group** is paged:*	*For **IPBS**: Time in seconds until **the group** is paged:*
20 characters	Unlimited	*~ 4*	*~ 4*
120 characters	Unlimited	*~ 5*	*~ 5*
240 characters	Unlimited	*~ 13*	*~ 13*
500 characters	Unlimited	*~ 31*	*~ 31*

A.3.3 Incoming Messages to DECT handsets in a Multicast Group

Number of message characters	*No of DECT handsets:*	*For **IPBL**: Time in seconds until **the group** is paged (threshold values within parenthesis):*	*For **IPBS**: Time in seconds until **the group** is paged (threshold values within parenthesis):*
20 characters	Unlimited	*~ 4*	*~ 4*
120 characters	Unlimited	*~ 5*	*~ 5*
240 characters	Unlimited	*~ 13*	*~ 13*
500 characters	Unlimited	*~ 31*	*~ 31*

Appendix B: Ascom Technical Documentation

This appendix explains the technical documentation structure and gives a description of each document type.

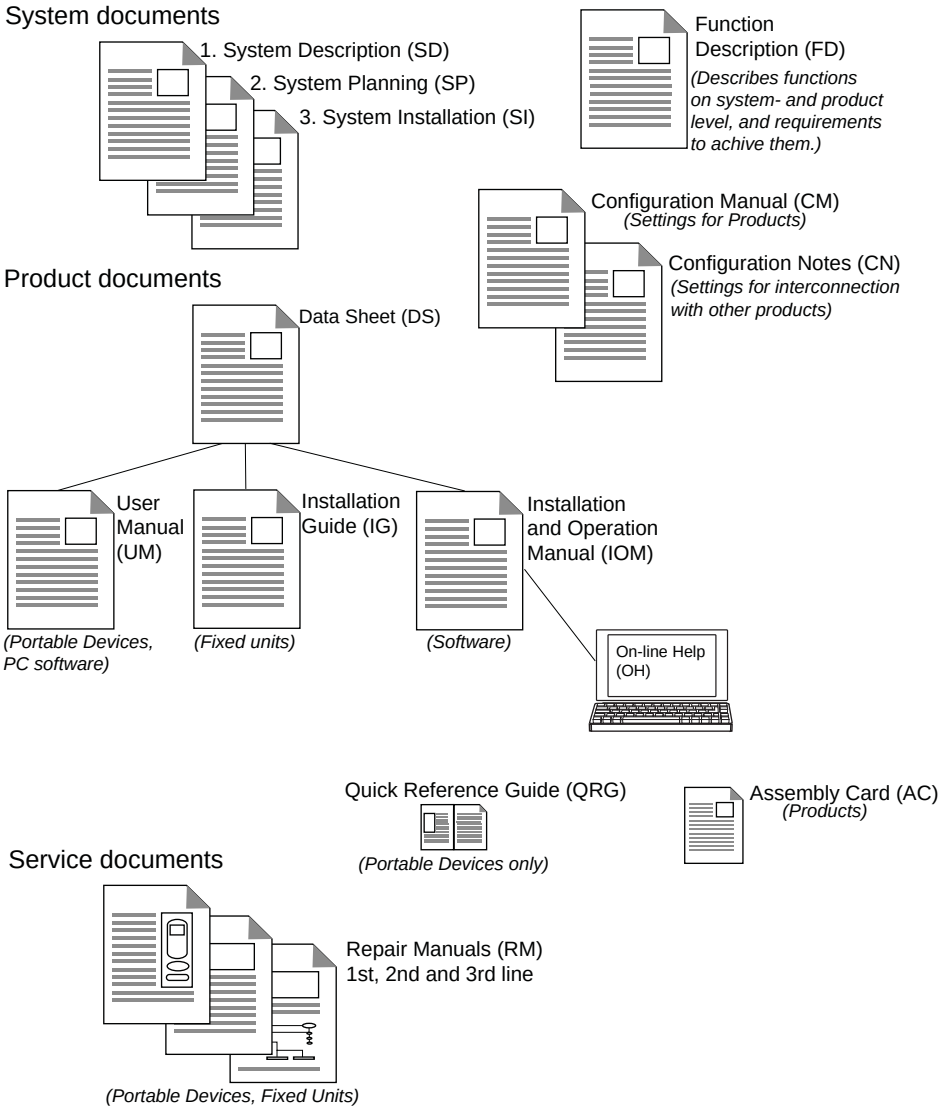

Figure 18. Document structure

System Description (SD)

Gives a general description of the system philosophy with basic functions and general configuration possibilities associated to functions.
Target groups: is relevant for system responsible at the customer site, sales department, training department, project manager or whoever wants to know the basics of the system.

System Planning (SP)

Is to be read after taking part of the System Description. It describes different functions, possible technical system solutions and deals with factors that can affect the installation.
Target groups: technical engineers planning a system.

System Installation (SI)

Primarily explains system dependent aspects to be considered at system installation and gives an overview of how to install the system.
Target groups: technical engineers planning the system and technicians installing it

Function Description (FD)

Gives all relevant information, requirements and configuration notes, concerning functions in system and products, for example positioning, interactive messaging etc.
Target groups: see under System Description section.

Configuration Manual (CM)

Describes the complete configuration for a specific product.
Target groups: installation-, service-, support technicians and system responsible.

Configuration Notes (CN)

Describes configuration required for two or more interconnected products to achieve best performance or specific functions. Is a complement to other product specific documents.
Target groups: installation-, service-, support technicians and system responsible.

Data Sheet (DS)

Technical data of a software/products etc. It includes a short list of features, applications and possibly extended functions with other software/products.
Target groups: end customer, system responsible, technical engineers and sales department.

Installation Guide (IG)

Describes how to install any fixed units in the system.
Target groups: installation- and service personnel.

Installation and Operation Manual (IOM)

Describes how to install and operate different PC software programmes. In many cases complemented with or replaced by on-line help or CD.
Target groups: service engineer or administration responsible of the end user system.

Quick Reference Guide (QRG)

This document is available for handsets only. It contains a concise, how to use description, and is normally distributed together with the handset.
Target groups: user of the handset for quick learning of included functions.

User Manual (UM)

For handsets:
Is a complement to the QRG. It gives a thorough description of the specific functions and how to use the product for example a Transceiver.
Target groups: responsible for handling the administration and distribution of pocket units at the end customer site, or anyone interested to get deeper usage knowledge.
For PC Software:
If it is preferable to separate installations and operations a UM describes how the end user operates the software.
In many cases UM is complemented with on-line help.
Target groups: End user.

On-Line Help (OH)

Gives help and information via the PC screen.

Repair Manual (RM)

For service and repair on some of the Ascom products. The document describes the repair of a product defined by one of three levels:
1st Line Repair
Mechanical/cosmetic repair such as change of housing etc. and upgrade of software. No advanced soldering knowledge is needed but test equipment to verify functionality/ quality after repair is needed. (Could also include test /programming equipment for field/ onsite service).
2nd Line Repair
Electrical repair on PCB level, changing of PCB:s, minor electrical repair of PCB level and change of easily soldered parts. Test equipment to verify functionality/quality after repair is needed.
3rd Line Repair
Advanced electrical repair on PCB level. Major knowledge in soldering technique is needed. Changing of SMD, BGA circuits etc. Advanced test equipment and equipment to verify functionality/quality after repair is needed.
Target groups: service- and support technicians.

Assembly Card

Leaflet packed together with a product. Shows either how to mount or assembly some part, for example a battery back, or how to start up a product.

Old documents: II = Installation Instructions
AA = Alignment and Adjustment
SAG = Setup & Application Guide
ED = Electrical Diagram
CD = Circuit Description
CL = Component Layout