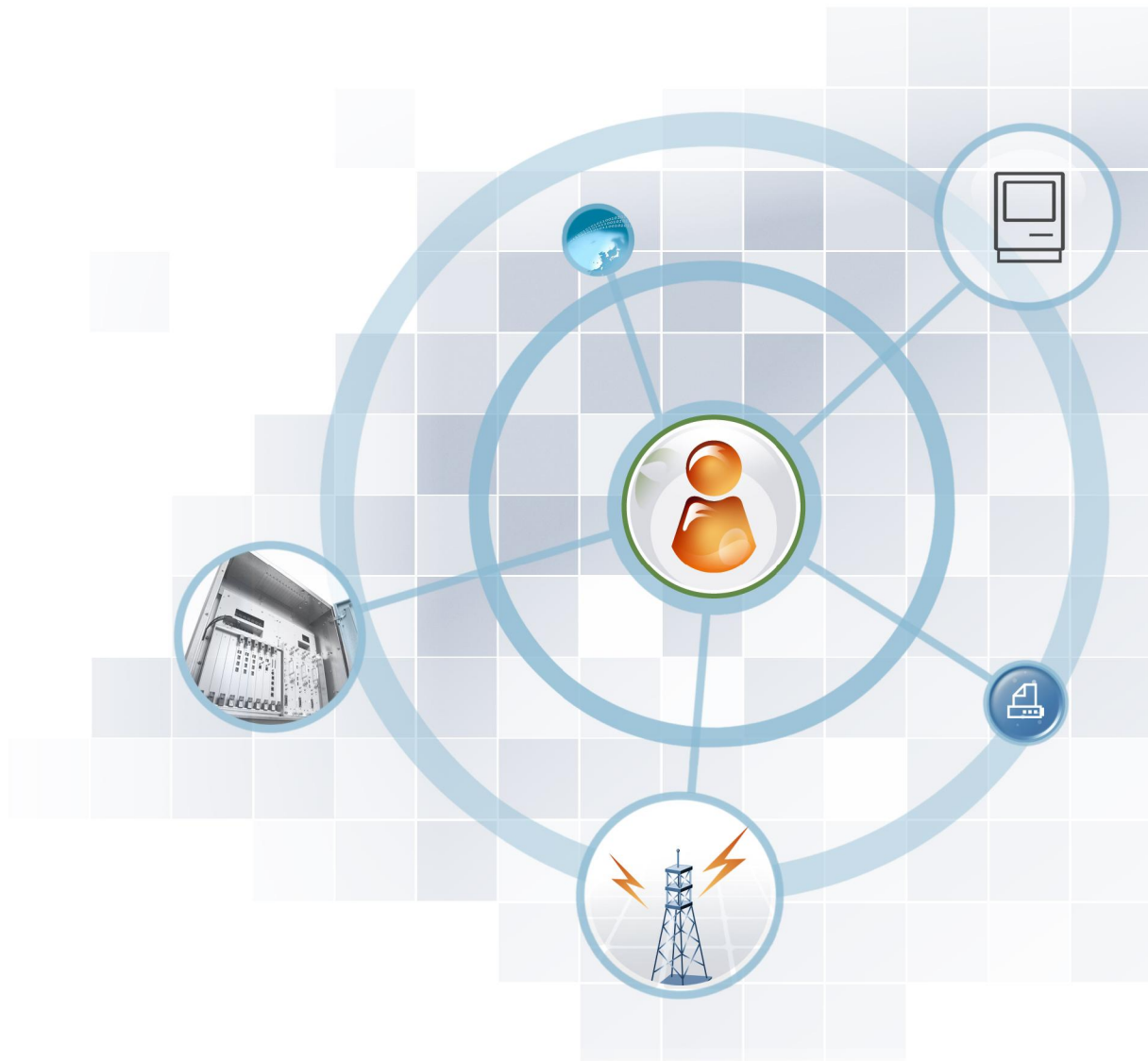


SCM Compact (IPX-S300B)

System Description



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This manual should be read and used as a guideline for properly installing and operating the product.

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Homepage: <http://www.samsungdocs.com>

General User Information

Radio Frequency Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to FCC Part 15 Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own risk.

FCC Requirements

The IPX-S300B (SCM Compact) equipment complies with FCC Part 68 Rules and requirements adopted by Administrative Council for Terminal Attachment (ACTA). The FCC Part 68 label is located on the bottom of the chassis. The label contains:

- Product Identifier Number
- FCC Registration Number
- Ringer Equivalence Number (REN)

Telephone Company Interfaces

A plug and jack is used to connect this equipment to the premises wiring and telephone network must comply with the FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product which is designed to connect to a compatible Standard Modular jack.

Connection to the telephone network should be made by using standard modular telephone jacks, type RJ-11C. The RJ-11C plug and/or jacks used must comply with the FCC Part 68 rules.

Unauthorized Modifications

Any change or modifications performed on this equipment that are not expressly approved in writing by SAMSUNG ELECTRONICS, CO., LTD. could cause non-compliance with the FCC rules and void the user's authority to operate the equipment.

Ringer Equivalence Number

The REN is used to determine the number of devices to be connected to a telephone line.

If the total allowable REN load is exceeded, the phone circuit may fail to ring. In most cases, the total REN for a telephone line should not exceed Five (5).

Contact Local Telephone Company, to be certain about the number of devices connected to a line, which is determined by the total REN.

For earlier products, the REN is separately shown on the label.

Incidence of Harm

The telephone company will notify you in advance about the temporary discontinuation of service, if this equipment is causing harm to the telephone network.

In case advance notification is not feasible, the telephone company will notify the customer as soon as possible and you will also be advised about your right to file a complaint with the FCC, if it is necessary.

Changes to Telephone Company Equipment or Facilities

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment.

If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

Service Center

If you need assistance during troubleshooting, please contact out local office SAMSUNG ELECTRONICS, CO., LTD. for repair or warranty information.

If the trouble is causing harm to the telephone network, the telephone company may request you to remove the equipment from the network until the problem is resolved.

Field Repairs

Only technicians certified on the Ubigate iBG2016 are authorized by SAMSUNG ELECTRONICS, CO., LTD. to perform system repairs.

Certified technicians may replace modular parts of a system to repair or diagnose trouble.

Defective modular parts can be returned to SAMSUNG ELECTRONICS, CO., LTD. for repair.

General

Connection to party line service is subject to state tariffs. Contact the State Public Utility Commission, Public Service Commission or Corporation Commission for information.

Equal Access Requirements

Through the use of access codes, this equipment is capable of providing user's access to interstate providers of operator services. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

Electrical Safety Advisory

Parties responsible for equipment requiring AC power should consider including an advisory notice in their customer information suggesting them to use a surge arrester. Telephone companies report that electrical surges, typically lightning transients, are very destructive to customer terminal equipment connected to AC power sources. This has been identified as a major nationwide problem.

Music on Hold Warning



In accordance with US copyright laws, a license may be required from the American Society of Composers, Authors and Publishers (ASCAP) or other similar organizations if copyright music is transmitted through the Music on Hold feature

SAMSUNG ELECTRONICS, CO., LTD. hereby disclaims any liability arising out of failure to obtain such a license.

DISA Warnings

The lines used for the DISA feature must have the disconnected Supervision option provided by the telephone company.



As it is impossible to control who may access your DISA line it is suggested that you do not turn this feature on unless you intend to use it. If you do use this feature, it is good practice to frequently change pass codes and periodically review your telephone records for unauthorized use.

Safety Warnings



High touch current earth connection is essential before making telecommunication network connection.



Energy Hazard-careful treatment is needed.



Every wire for communication should be larger than 26 AWG.



Double pole/neutral fusing.

Underwriters Laboratories

The IPX-S300B has been tested to comply with Safety Standards in the United States and Canada. This system is listed with Underwriters Laboratories. The cUL Mark is separately shown on the label.

Installation Safety Guidelines and Warnings

Safety Recommendations

The Safety Warnings that appear in this document (such as the one below) indicate a procedure that can harm you if not done correctly.



Electric hazard exists. Verify the power is turned off. Do not work on energized equipment. Working on energized equipment can result in serious electrical shock.



To avoid electric shock, do not connect Safety Extra-Low Voltage (SELV) circuits (found in LAN ports) to Telephone-Network Voltage (TNV) circuits (found in WAN ports).



This equipment must be installed and maintained by properly trained service personnel. Make sure the proper electrical service is available before plugging the unit and turning it on. Disconnect the telecommunication lines before unplugging the main power connector.

Cover Panels

Do not operate the IPX-S300B with missing blank faceplates and cover panels. These covers prevent exposure to hazardous voltages and currents inside the chassis. They are important to maintaining proper air flow through the chassis. They also prevent electromagnetic interference (EMI) that might disrupt other equipment.



Laser radiation and EMI are present when the router cover panel is open.

Electrostatic Discharge (ESD) Warning

Observe the following guidelines to minimize the potential for Electrostatic Discharge (ESD) damage, which can cause intermittent or complete component failures.



When handling IPX-S300B or its components, wear grounding wrist straps to avoid ESD damage to the equipment. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

Always use an ESD wrist strap or ankle strap, and verify that it is in direct contact with your skin. Avoid contact between the component and your clothing as it causes ESD damage.

When handling any component that is removed from the chassis, verify that the equipment end of your ESD strap is attached to one of the ESD points on the chassis.

Use care when installing or uninstalling modules or interface cards. Tighten the captive installation screws to ensure a proper connection when inserting modules or interface cards.

When removing or installing a component, always place it component-side up on an antistatic surface, in an antistatic card rack. If you are returning a component, place it in an electrostatic bag before packing it.

INTRODUCTION

Purpose

This document describes the basic overview and features of the SCM Compact system. The product model name of the SCM Compact system is the IPX-S300B.

Document Content and Organization

This manual consists of the following parts.

CHAPTER 1. IPX-S300B System Overview

This part describes the IPX-S300B network interface and the operation environments and capacity of the IPX-S300B.

CHAPTER 2. IPX-S300B Hardware

This part describes the characteristics of the system hardware.

CHAPTER 3. IP Phones

This part describes the characteristics of the IP Telephone served by IPX-S300B.

CHAPTER 4. System Features

This part describes the characteristics of the IPX-S300B features.

CHAPTER 5. User Features

This part describes the characteristics of the User features.

CHAPTER 6. Application Features

This part describes the characteristics of the application features.

CHAPTER 7. Network Features

This part describes the network features of the system.

CHAPTER 8. SBC Function

This part describes the SBC function of the system.

CHAPTER 9. System Operation

This part describes the operation and management features of the system.

ANNEX A. Supported Specifications and RFC

This part describes the supported specifications and RFC used in the IPX-S300B.

ANNEX B. CDR

This part describes the call log format and CDR format used in the IPX-S300B.

ANNEX C. Open Source Announcement

This part describes the open source announcement.

ABBREVIATION

This part describes the acronyms used in this document.

Conventions

The following types of paragraphs contain special information that must be carefully read and thoroughly understood. Such information may or may not be enclosed in a rectangular box, separating it from the main text, but is always preceded by an icon and/or a bold title.



WARNING

Provides information or instructions that the reader should follow in order to avoid personal injury or fatality.



CAUTION

Provides information or instructions that the reader should follow in order to avoid a service failure or damage to the system.



CHECKPOINT

Provides the operator with checkpoints for stable system operation.



NOTE

Indicates additional information as a reference.

Console Screen Output

- The lined box with ‘*Courier New*’ font will be used to distinguish between the main content and console output screen text.
- ‘**Bold Courier New**’ font will indicate the value entered by the operator on the console screen.

Revision History

VERSION	DATE OF ISSUE	REMARKS
3.0	10. 2016.	SCM Compact V2.0 S/W upgrade features added.
2.0	10. 2016.	Align manual version numbers in Korean and English
1.0	10. 2015.	First Version

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CHAPTER 1. IPX-S300B System Overview

1.1 General Description

The SCM Compact (model name: IPX-S300B) provides an IP-based service platform for using a wide range of applications for communications within an enterprise. It is aimed at the SMB market in existing small-scale hybrid PBXs.

The IPX-S300B provides VM/AA and conference functionality as well as trunk/extension and general PBX function in a single box. The highly scalable structure allows easy expansion of VM/AA and conference channel cards when necessary. The product also provides built-in NAT and SBC Lite functions.

The call processing software is installed in the main cabinet, and analog extension/trunk, PRI and BRI circuits can be expanded using optional card slots.

The total SCM solution organizes IPX-S300B, phone, gateway, SCM Administrator and application as shown following diagram.

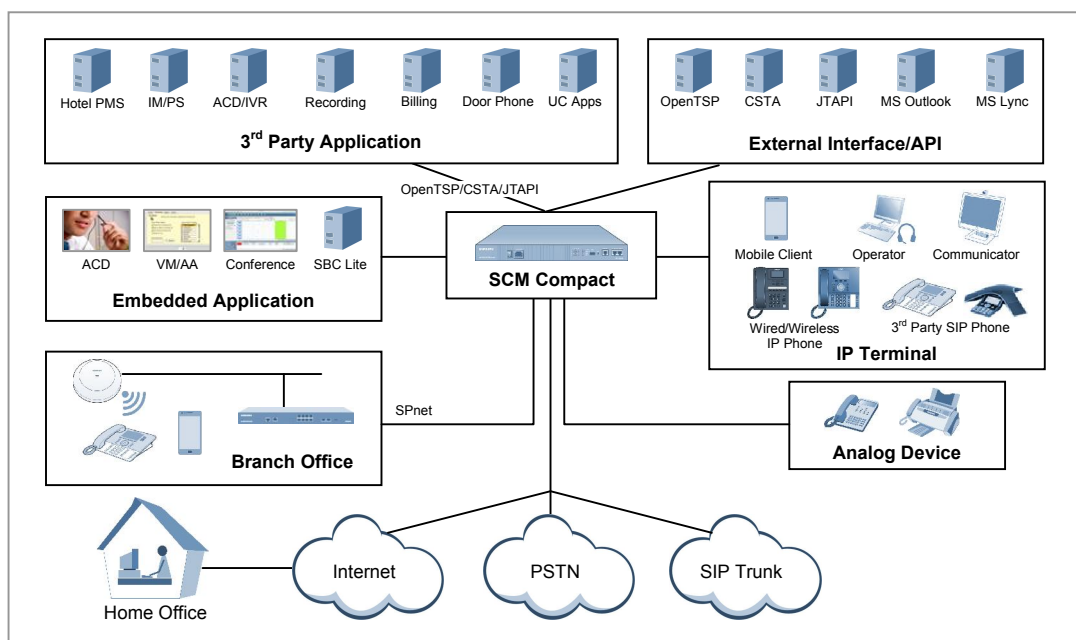


Figure 1. SCM Compact Architecture

1.2 System Architecture

As shown in Figure 1, the SCM Compact consists of the IPX-S300B, gateway, IP phone, SCM Administrator, and application server.

Data network systems such as switches and routers are basic requirements of the SCM Compact and are not included as system components.

1.2.1 IPX-S300B

The IPX-S300B uses the SIP protocol to provide IP-PBX call processing functionality and uses analog extension (FXS), analog trunk (FXO), ISDN-PRI, ISDN-BRI interfaces, etc. to communicate with the existing voice networks. The product also provides built-in NAT, DHCP and SBC Lite functions.

1.2.2 Voice Gateways

The voice gateway is responsible for connecting the existing telephone and networks. It communicates with the existing telephone network (PBX or PSTN) through the PRI interfaces as well as analog interface like FXO.

The voice gateway acts as a media gateway, which performs the conversion between PCM data and packet data. It communicates with IPX-S300B over the standard SIP protocol.

The IPX-G5x0 product series can be used as voice gateway.

1.2.3 IP Phones

IP Phone provides general telephone calls on the IP network. For providing basic calling and supplementary services, IP Phone communicates with SCM Compact (IPX-S300B) using the SIP protocol (Samsung SIP Extension) that is partially extended from the standard.

The following types of IP phones are supported by IPX-S300B.

- SMT-i6000 Series
- SMT-i5343, SMT-i5243, SMT-i5220S, SMT-i5220, SMT-i5210S, SMT-i5210, SMT-i5264
- SMT-i3105, SMT-i2205G, SMT-i2205S, SMT-i2205

IP Video Phone

Video Phone allows voice and video calls over an IP network.

For provision of basic call and additional services, IP Video Phones communicate with the IPX-S300B using an expanded version of the SIP protocol (Samsung SIP Extension).

Soft Phone

Soft Phone runs on a PC (Personal Computer) as a software program. It allows voice-only calls or voice and video calls over an IP network.

Wi-Fi Phone

Wi-Fi Phone connects to an IP network using the Wi-Fi protocol and allows voice calls.

PDA Phone

PDA Phone connects to an IP network over the Wi-Fi protocol. It is provided as a software program that runs on existing PDAs and allows voice-only calls or voice and video calls.

Analog Phone

The system provides analog voice call service using the FXS port which is an optional card.

1.2.4 SCM Administrator

SCM Administrator is web-based service with a graphical user interface for managing IPX-S300B. You can use a web browser on a normal PC to access IPX-S300B and execute various IPX-S300B services like Fault Management, Performance Management, Security Management, Accounting Management and Subscriber Management.

1.2.5 Application Server

The IPX-S300B provides the following built-in services. VM/AA and conference channels can be expanded by adding optional cards.

MOH (Music On Hold) Server

MOH provides the music on hold when a call is put on hold and the voice announcement in the case of errors. It also provides an announcement when a call is queued in the embedded ACD server. In addition, the MOH server collects DTMFs from the caller while executing the user interaction services such as DISA.

SBC Lite

Normally, an SBC server is required for signaling and media (voice and video) connections when establishing calls between phones in the public IP side and those in the private IP side. IPX-S300B includes the NAT traversal function which is one of the services of SBC.

Conference Server

Responsible for combining all the individual voice data in calls involving three or more users into one data set. In a conference call, each phone is connected for a 1:1 call with the conference server, but the conference server combines the data from all the different phones into one data set so the parties can hear each other.

The conference server included in IPX-S300B not only provides the normal conference feature with which the caller pages all the parties to include in the conference, but also provides an advanced conference feature with which a conference room can be set up and the parties can voluntarily call to enter the conference room and participate in the conference. The product provides a default conference capacity and services add-on conference. By adding VPU card, IPX-S300B can be expanded channels and can be added conference service (For example, Meet-me conference, Paging on Answer). The Meet-me conference service requires a license.

ACD (Automatic Call Distribution) Server

The ACD server distributes the incoming calls to agents according to the status of the agents. It also collects real-time call statistics on groups and agents and aggregates the information.

IVR (Interactive Voice Response) Server

The IVR server provides the interactive voice response service that collects DTMFs from the caller and provides proper responses according the DTMF.

VM/AA (Voicemail/Auto attendant) Server

The voice mail service, in particular, constitutes a key component of the enterprise communication system by allowing the calling party to be connected to the VM/AA server and leave a voice message in the called party's mailbox. When there is a new voice mail, the user is notified of by an indicator light on the user's phone or in a notification email sent to the user's Outlook account.

The user can then call the VM/AA server to listen to, reply to, send, or delete the voice mail. The product provides a default VM/AA service, which can be expanded with more channels by adding VPU cards. The VM/AA function requires a license.

Mobility Server

The product provides in-house extension phone call service using smartphones. When using both the cellular network and Wi-Fi network, the integrated dialer allows switching between the extension network and cellular network. The Mobile Extension function also allows the smartphone to be used in the same way as an extension phone outside the office. This service requires a separate license.

1.2.6 External Application Servers

The following application servers are separated in the IPX-S3000B system.

Billing Server

The billing server is a device that receives the billing information (CDR: Call Detailed Record) that are generated from various call handling systems, extracts the billing data needed for actual operation, and performs the tasks such as various billing related statistics and others. IPX-S300B sends CDR that is generated after the call handling to the Billing server by using the protocols such as TCP or FTP.

1.2.7 Interface between the Network Components

The table below describes the interface between each system component.

Area	Physical Connection	Protocol
IPX-S300B ↔ IP Phone	LAN	SIP
IPX-S300B ↔ Wi-Fi Phone	LAN	SIP
IPX-S300B ↔ Soft Phone	LAN	SIP
IPX-S300B ↔ Management	LAN	TCP
IPX-S300B ↔ Solution Partner	LAN	SIP/CSTA/TAPI/JTAPI
IPX-S300B ↔ Voice Gateway	LAN	SIP
IPX-S300B ↔ Media Gateway	PRI/BRI/FXO	PRI/BRI/Loop Start

1.3 IPX-S300B Specification

1.3.1 Hardware and Software Specification

The IPX-S300B has the following hardware and software requirements for operation.

Table 1. IPX-S300B Hardware Specification

Item		Specification		Remark
Dimension (W × D × H)		441.5 × 352 × 44 mm		19" Cabinet Type, 1U
Power		AC 110/220 V Input, DC +12 V/5.5 A Output		-
IPX-S300B	Default	4 Universal Slot, Dual power (option)		-
		Gigabit Ethernet 2 port		-
		USB 1 port, Console 1 port		-
	Option card	4 universal slot	No limitation in the its position. (But, Only 1 VPU Card can be equipped) RJ-45 connector	
FXS 4 port, FXO 4 port, PRI 2 port, PRI 1 port, BRI 2 port, VPU Card				
IPX-G520S/G540S		Connected up to 6 (240 ports)	FXS 20 port, Dual power (option) FXS 40 port	50P champ connector

Table 2. IPX-S300B Software Specification

Item	Specification
OS	Broadcom Linux (Version: 3.6.11)
DBMS	PostgreSQL (Version: 8.4.14)
SNMP	NET-SNMP (Version: 5.5)

1.3.2 IPX-S300B Capacity

Table 3. IPX-S300B Capacity

Item		Specification	Remark
No. of Telephone	IP Telephone	512	UDP/TLS
	IP AOM	64	-
	Analog Phone	256	136 ports in case of Dual Power
	Phone Total Capacity.	512	-
No. of Trunk Line	SIP channel	128	-
	PRI channel	120 (E1 PRI) 92 (T1 PRI)	4 ports
	BRI channel	16	8 ports (for only Euro market)
	FXO port	16	-
	Trunk Total Capacity.	256	-
VM/AA Channel	Embedded	6	-
	VPU	32	-
Total Conference Channels.	Embedded	6	-
	VPU	32	-
Meet-Me Conference Channels	VPU	32	-
Paging Channels	VPU	32	-
Call Recording Channels	VPU	20	- Samsung IP Phone: Max. 20 calls - Others: Max. 10 calls
SBC	Embedded	128	-
No. of MOH Ch.	Embedded	16	-
Max. No. of Gateway	-	32	-

Table 4. Performance (UDP/TLS signaling)

Item	Specification	Remark
Max. Registered Users	512	600 sec register expires
Max. BLF count	5120	10 BLFs/phone
BHCA	18000	60 s/call
Max. Concurrent Calls	150	-
CPS	5	72 hours, 600 sec register expires

- BHCA (Busy Hour Call Attempt): Maximum number of outgoing/incoming calls per hour.
- CPS (Call Per Second): Maximum number of outgoing/incoming calls per second.
- Max. Concurrent Calls: Maximum number of concurrent calls.

Table 5. Table Capacity

Item	Specification	Remark
Max. User Group	1	-
Max. Ring Plan	20	-
Max. Service Group	10	-
Max. the Location	64	-
Max. End Point	64	-
Max. DID Routing	1000	-
Max. CLI Routing	1000	-
Max. Number-translation table	1024	-
Max. Call Restriction List	128	-
Max. Call Restriction Table	1024	-
Max. Service Class	50	-
Max. Station Groups	100	-
Max. Paging Groups	32	-
Max. Station Group Members	128	-
Max. Multi-ring Members	10	-
Max. Group Call Forwards	50	-
Max. ACD Agents	128	-
Max. ACD Groups	32	-
Max. ACD Group Members	512	-
Max. System Speed Dials	1000	-
Max. Pickup Groups	64	-
Max. Multi-lines per Phone	10	-
Max. Multi-devices per User	10	-
Max. Call Buttons per Phone	8	-

CHAPTER 2. IPX-S300B Hardware

This chapter describes the IPX-S300B hardware.

2.1 Features

The IPX-S300B hardware has the following features.

Safety

Materials and components used in hardware are mechanically sturdy and satisfy mechanical and electrical requirements for a communications system.

- The hardware complies with industrial standards and has a stable and strong metal plate welded assembly structure.
- The hardware does not generate toxic gas or corrosive gas which may be harmful to human health or affect system operation.
- The hardware is made of materials with considerations for EMI (Electro-Magnetic Interference) properties.
- The hardware features a safety mechanism for protection from over-voltage.

Ease of Maintenance

The hardware is designed for easy and safe maintenance.

- The hardware complies with the standard rack specifications for installation of units that are 482.6 mm in width, and the rack is designed to maintain adequate strength.
- External ports are provided on the front panel for easy connection of cables.
- Status LED lights are provided on the front for the operator to easily identify system failures and status.
- The rear panel of the rack features a grounding hole.
- The hardware is designed to protect the electronic components from external elements during installation or maintenance.

Fire Resistance and Heat Processing

Fire-resistant materials and components have been used for protection from fire, and the hardware is designed to prevent the heat of the system from affecting performance.

- Heat-generating components of the hardware are isolated from temperature-sensitive components.
- Three 40-mm cooling fans are installed to expel air from the inside.
- Components installed on the module are laid out in consideration of heat dissipation.

Redundancy of Power

The hardware features redundant power supply.

- When one power supply module fails, the other power supply module ensures that services are not interrupted.
- Power modules cannot be mounted or unmounted by the operator at the site of operation.

2.2 IPX-S300B

2.2.1 IPX-S300B

IPX-S300B can be mounted on 19-inch (482.6 mm) wide rack and its height is 1.75-inch (1U). The appearance is like the following.

Front



Front (Dual Power Supply)



Figure 2. IPX-S300B exterior

2.3 Hardware Structure

2.3.1 IPX-S300B

IPX-S300B hardware consists of CMU board, GWU board, optional modules, power supply and 3 fans.

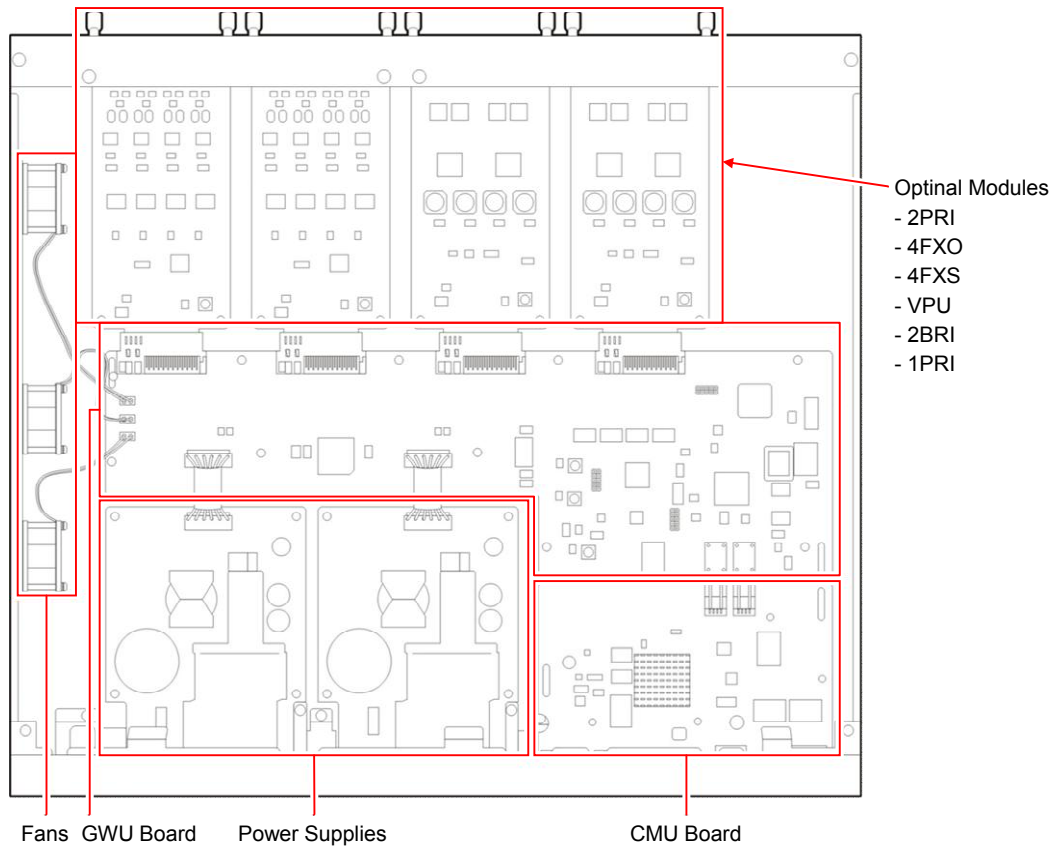


Figure 3. IPX-S300B interior

2.3.1.1 CMU Board

The CMU board of IPX-S300B is like the following.

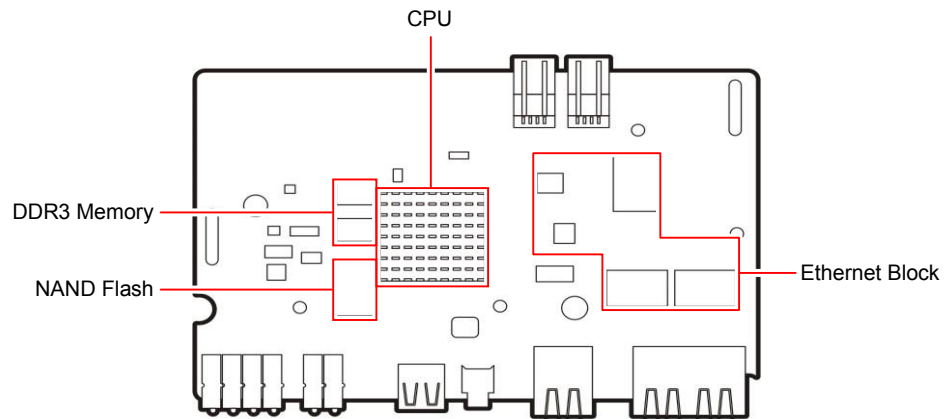


Figure 4. CMU Board

2.3.1.2 GWU Board

The GWU board of IPX-S300B is like the following.

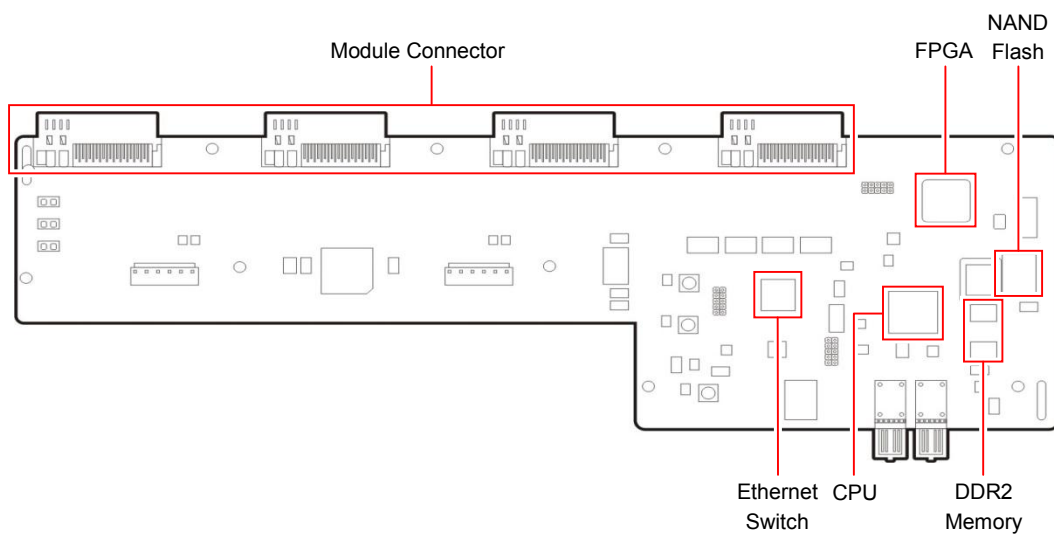


Figure 5. GWU Board

2.3.1.3 Optional Modules

There are the following optional modules for IPX-S300B.

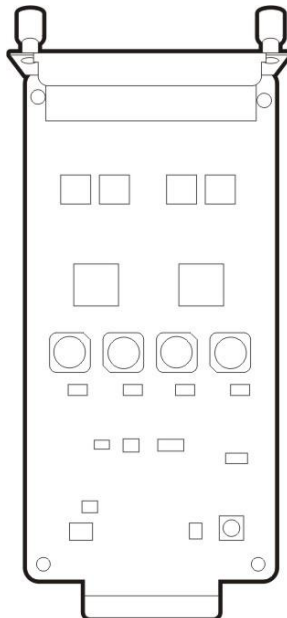


Figure 6. 4FXS optional module

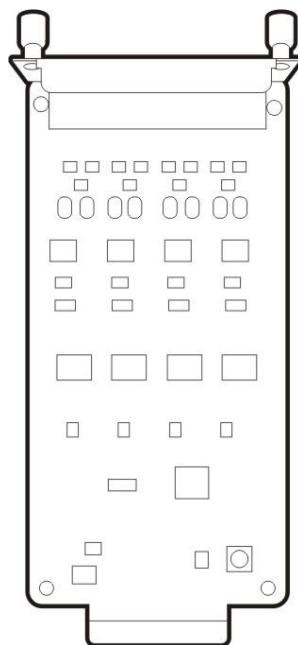


Figure 7. 4FXO optional module

Ошибка! Используйте вкладку "Главная" для применения 제목 1 к тексту, который должен здесь отображаться..
Ошибка! Используйте вкладку "Главная" для применения 제목 1 к тексту, который должен здесь отображаться.

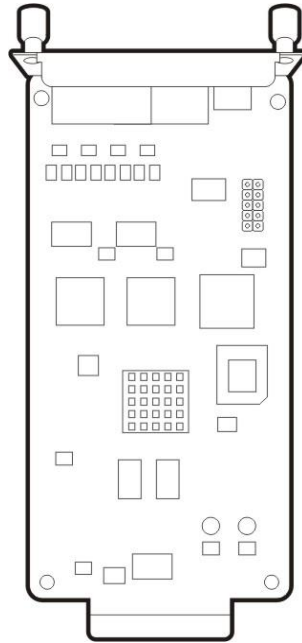


Figure 8. 2PRI optional module

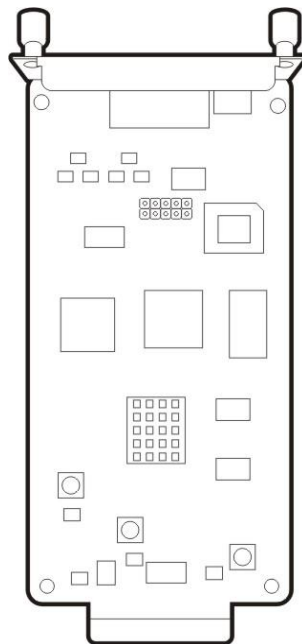


Figure 9. 1PRI optional module

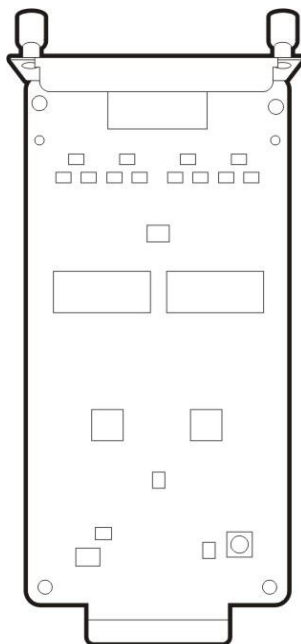


Figure 10. 2BRI optional module

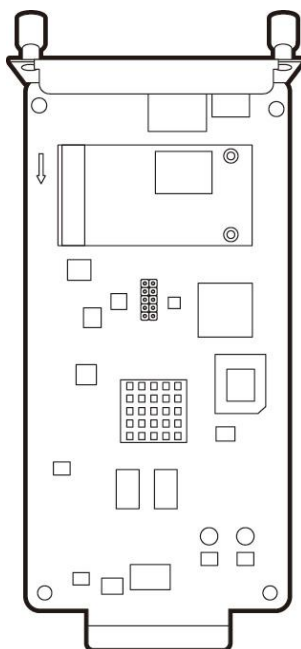


Figure 11. VPU optional module

2.3.1.4 Power Supply

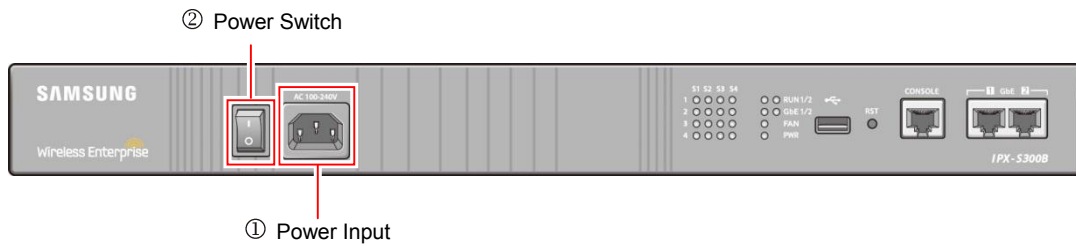


Figure 12. IPX-S300B Power Input

Name	Description
① Power Input Connector	The connector to insert power cable
② Power Switch	The switch to turn on or off power

2.3.1.5 FAN

IPX-S300B provides 3 embedded fans (40 mm size) and it has holes for the fan on the left side of the system.

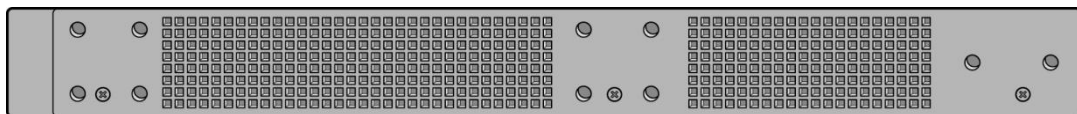


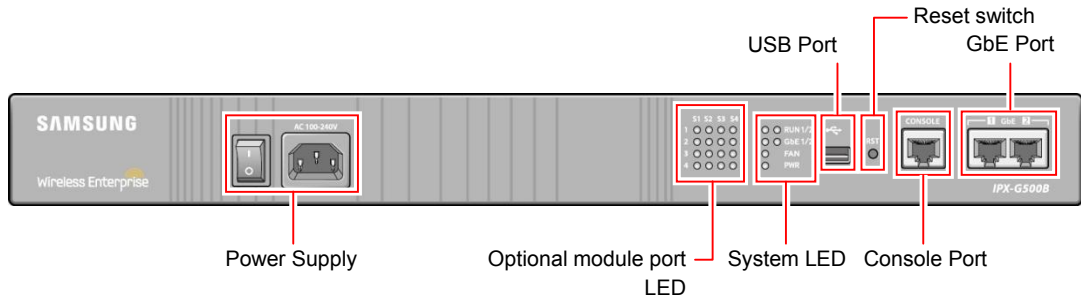
Figure 13. IPX-S300B FAN

2.4 External Interface

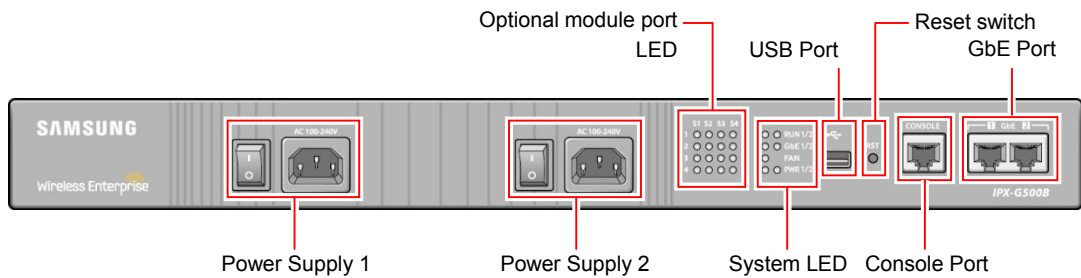
2.4.1 IPX-S300B

IPX-S300B provides external interfaces like the following.

- **IPX-S300B Front**



- **IPX-S300B (Dual Power Supply) Front**



- **IPX-S300B Rear**

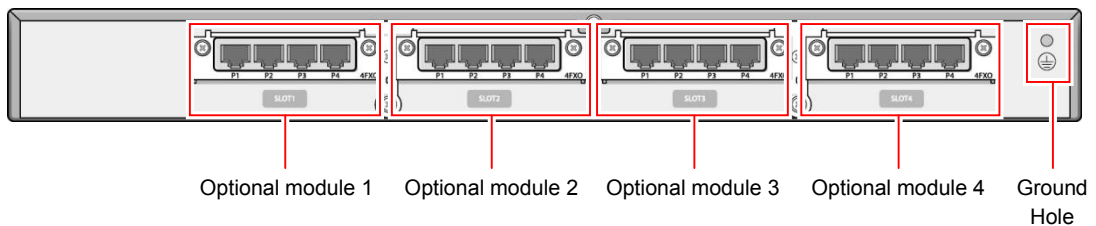
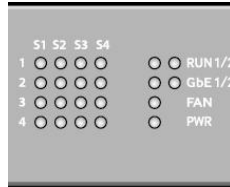


Figure 14. IPX-S300B Interface Front/Rear

System LED

It provides System LED to display various status of the system. Refer to the following for its meaning.

- **IPX-S300B**



- **IPX-S300B (Dual Power Supply)**

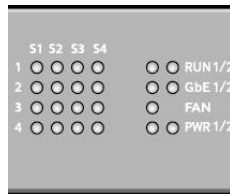


Figure 15. IPX-S300B LED

Table 6. IPX-S300B LED Description

LED	State	Description	
Optional module port	Off	Module not mounted or ready to Service	
	On	Operating (port in use) Layer2 link status (1PRI, 2PRI, 2BRI)	
	Blinking	Ringing state (4FXS, 4FXO)	
System	RUN1	Blink quickly (50 ms on/off)	Booting, Upgrading, DB Initializing
		Blink (250 ms on/off)	All Processors are in normal operation
		Blink slowly (1000 ms on/off)	Fault (Upgrading, DB initialization)
	RUN2	On	Preparing to boot
		Blink quickly	Booting
		Blink slowly	Normal Operation after booting
	GbE1/2	Off	LAN disconnected
		On	LAN connected
		Blinking	Transmitting/Receiving Data
	FAN	Off	FAN out of order
		On	Normal operation
	PWR1/2	Off	Power Module is off or out of order
On		Power module is installed and in normal operation	



NOTE

Optional module port LED

If each Layer 2 of the 1PRI, 2PRI, or 2BRI card is judged to be connected, an LED on the option module port turns on; as many LEDs on the option module port as the number of the connected links turn on. The dislocation of a cable or a card disconnects the corresponding link, which in turn causes an LED to turn off. Note that resetting a card disconnects the corresponding Layer 2 connection but not an LED. An LED gets turned off afterwards when the card is rebooted and then turns back on again.

VPU LED

The VPU option module provides LEDs which indicate various status. Refer to the following for its meaning

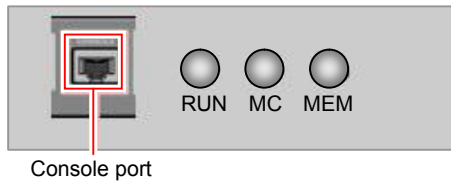


Figure 16. VPU Option Module LED

Table 7. VPU LED Description

LED		State	Description
VPU	RUN	Blink (200 ms on/off)	Each processor operating normally
	MC	Off	SSD not equipped
		Blink slowly	Preparing to boot/being booted (SSD is equipped)
		On	Operating normally after a successful boot (SSD is equipped)
		Blink quickly (200 ms on/off)	Access SSD after booting
	MEM	Off	80 % or less of SSD in use (normal)
		On	More than 80 % of SSD in use
		Blink quickly (200 ms on/off)	More than 95 % of SSD in use

Console Port (RS232C)

IPX-S300B provides console port to debug the system or to set basic configuration by CLI. The baud rate is 38,400 bps.

GbE Port (1 GE UTP)

To connect the network, it provides two 1000 BASE-T UTP ports.

USB Port (Host 2.0)

It provides USB port to update the software of IPX-S300B. It supports general USB memory stick.

Reset Switch

It supports to reset the system by reset switch.

Optional Modules

IPX-S300B supports optional cards such as 4 ports FXO card, 4 ports FXS card, 2 ports BRI card, 1 port PRI card, 2 ports PRI card, a VPU card.

At first, blank dummies are embedded, so remove them when you install optional modules.

The VPU module must not be equipped or uninstalled during in its operation. It must be performed in additional 5 seconds after the module is completely shut down by pressing the reset button for 10 seconds. The VPU module will restart by pressing the Reset button for a few seconds. (less than 5 seconds).

Following is the distance limitation for connecting either BRI or PRI to another system.

- BRI module: 20 m
- PRI module: 200 m

CHAPTER 3. IP Phones (SMT-I series)

This chapter describes the types and functions of devices that can be connected to the IPX-S300B system. Types and functions of devices that can be connected to the IPX-S300B system are the same for all systems.

For details on using each of the devices, see the user manual of the phone.

SMT-i6021

- 3.2" Mono LCD
- HD Voice
- Smart Phone Interworking
- WiFi Backhaul
- Bluetooth Headset
- USB Interworking
- 4 soft keys
- 24 programmable keys
- Navigation keys for easy use of Keyset functions
- Keyset Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i6020

- 3.2" Mono LCD
- HD Voice
- Smart Phone Interworking
- USB Interworking
- 4 soft keys
- 24 programmable keys
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i6011

- 3.2" Mono LCD
- Smart Phone Interworking
- WiFi Backhaul
- Bluetooth Headset
- USB Interworking
- 4 soft keys
- 12 programmable keys
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i6010

- 3.2” Mono LCD
- Smart Phone Interworking
- USB Interworking
- 4 soft keys
- 12 programmable keys
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i5343

- 4.3” Color TFT LCD
- HD Voice
- Smart Phone Interworking
- WiFi Backhaul
- NFC
- Bluetooth Headset
- Dedicated USB Camera Interworking
- 5 soft keys/10 line keys
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i5243

- 4.3" Color LCD
- USB Camera Interworking
- 5 soft keys/5 line keys
- 14 programmable key
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i5230

- 3.2" Mono LCD
- 4 soft keys
- 7 programmable keys
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i5220/5220S/522D

- 3.2" Mono LCD
- 4 soft keys
- 24 programmable keys
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i5210/5210S

- 3.2" Mono LCD
- 3 soft keys
- 14 programmable keys
- Navigation keys for easy use of Keypad functions
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i3100/i3105

- 2.8" Mono LCD
- 3 soft keys
- 5 programmable keys (with LED)
- Keypad Status Indicator
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i2205/2205S/2205D

- 2.8" Mono LCD
- 3 soft keys
- 5 programmable keys (Without LED)
- Volume Up/Down keys for digital control of speaker, handset and ringer volume



SMT-i5264 IP AOM

IP-AOM (IP based Add On Module) is an accessory-type IP terminal with expansion of key buttons and LED on an IP phone. Each of the key buttons on the IP-AOM can be assigned with various custom functions such as DSS (Direct Station Select), BLF (Busy Lamp Field), and one-touch dial button.

- 64 Buttons Add On Module



CHAPTER 4. System Features

This chapter describes system features provided by IPX-S300B. System features are performed according to the configuration of the system, not individual user setting.

Anonymous Call Reject

The anonymous call reject service rejects anonymous incoming trunk calls without caller IDs.

This function can be enabled or disabled by the operator.

Call Admission Control (CAC)

Since system resources are limited, a service is required to set the maximum number of calls at any one time. The Call Admission Control (CAC) service provided by IPX-S300B includes CAC by call counts, CAC by location bandwidth, CAC by system resources, and CAC by trunk call counts.

All CAC is independently operated by each node.

- **CAC by Call Counts**
This function rejects calls that exceed the maximum call count supported by the IPX-S300B.
- **CAC by System Resources**
The CAC by system resources service restricts calls made in excess of the maximum usage ratio set for the system CPU and memory.
- **CAC by Location Bandwidth**
The CAC by location bandwidth service restricts the calls made in excess of the bandwidth set for each location.
When calls are made between users or endpoints in different locations, the system calculates the bandwidth based on the codec used for the calls. Any calls exceeding the maximum bandwidth set for each location are restricted.
- **CAC by Trunk Call Counts**
CAC by trunk call counts restricts calls when the maximum trunk call count supported by IPX-S300B is exceeded. If you don't set the maximum inbound call or maximum outbound call value, CAC for the trunk call (Inbound call or outbound call) does not work.

Emergency CAC

When CAC by system resource, region or trunk call count is exceeded, the system decides whether the incoming call is an emergency call and, if so, disconnects existing calls and processes the emergency call.

Least Cost Route (LCR)

IPX-300B performs the LCR service in various ways.

- **LCR by Location**
The LCR by location feature allows you to assign one of the three LCR methods (priority-based LCR, time/rate based LCR, and equally distributed LCR) for each location of the calling party.
- **Priority Routing**
The route sequence feature allows automatic selection of alternative routes when the endpoint set as the default LCR is not available for call connections. Routes are assigned with priorities so that the route with the highest priority among those available is selected.
- **Time-based Routing**
The special route sequence feature allows each service group to use its own route sequence features based on its time and rate conditions.
- **Load-balanced Routing**
The route set feature allows the use of the set routes in an equally distributed manner according to the set ratio. Calls are distributed only between the routes identified as available for calls, and therefore there is no need for configuring alternative routes, as in other LCR methods.

Call Restriction

The IPX-S300B allows restriction of outgoing calls or incoming calls for each user. It is also possible to restrict all outgoing calls and incoming calls. Also, when an external call is placed through a trunk route, usage of the trunk route can be allowed or disallowed.

IPX-S300B supports the following three types of call restriction policies.

- **Extension Lock**
You can restrict outgoing calls or incoming calls for users. You can also restrict both outgoing and incoming calls. This setting is applied to all calls, whether internal or external.
- **Route Lock**
You can specify whether to use a route for external calls coming through the endpoint connected to the route.
- **Call Restriction Policy**
Call restriction policies can be applied by analyzing the calling number or called number when external calls are made to the users or external calls are made by the users through the trunk.

The call restriction tables created and configured in the menu described below can be applied to specific users, service groups, or user groups for call restriction.

If multiple call restriction policies are applied to a user, the policies are applied in the priority of user, service group, and user group.

In Tandem call case, Trunk is restricted by incoming trunk's restriction policy.

Call Transfer Restriction Policy

If call restriction numbers are set, call restriction policy can be applied by analyzing the caller's number when the user switches to trunk line. Call restriction tables can be assigned to service levels so that call restriction policy is applied when switching to trunk line.

Number Translation

IPX-S300B can translate numbers for inbound and outbound calls.

Number translation by multiple MCN allows to replace particular digits in a first position of the called number for outbound calls. Additionally, deleting digits or adding digits are possible for Inbound and outbound calling/called number.

Call Button

The call button feature allows directing multiple calls to the one phone number when the user's number is a single device and the call waiting service is in use.

If you are using a phone with programmable buttons, such as a Samsung phone, you can assign up to eight call buttons. If there are ten call buttons, the phone can control up to ten calls simultaneously. If there is no call button on the phone, it is treated as having two call buttons.

Internal CLI Number

Default Internal CLI Number is extension number.

Extension number is unique number within user group, not allow duplicate.

It is used for call for calling/called number.

IPX-S300B also provide another Internal CLI Number for specific use.

Outbound Calling Line Identification (CLI)

The Outbound CLI service provides several ways to express outbound CLI such as phone CLI, user CLI, service group CLI, user group CLI, and virtual trunk CLI.

- **Outbound CLI Number**
IPX-S300B provides several ways to present user CLI. Multi-Extension Phone can have Virtual Phone CLI to express same CLI for several users of the phone. Each user can have Send CLI Number for outbound calls. Additionally, the members in a group such as Service Group or User Group can use the CLI Number for the group if the users don't have Send CLI Number in User Configuration. CLI Prefix in Route Configuration provides CLI prefix for the users who aren't assigned any CLI Numbers.

- **Outbound CLI Name**

If a SIP ISP requires some specific number for the trunk, Virtual Trunk CLI can be used.

If this option is enabled for outbound call, an original 'display name' in From header of INVITE message is replaced with the Virtual Trunk CLI for the Route.

Internal CLI Name

IPX-S300B provides Internal CLI Name, used for inbound trunk call.

It is used for subscriber or service group.

Premium CID

IPX-S300B provides supplementary information of opposite user to a FMC user.

Basically photo is delivered and additional information are possible up to 6 according to a configuration.

Calling Line Identification (CLI)

The Calling Line Identification (CLI) service notifies the user of the caller's phone number and name for incoming calls.

- **Calling Line Identification Presentation (CLIP)**

The Calling Line Identification Presentation (CLIP) service displays the caller's phone number and name on the called user's phone for incoming calls.

- **Calling Line Identification Restriction (CLIR)**

The Calling Line Identification Restriction (CLIR) service restricts display of the caller information for the calls made by the user.

If a user set with CLIR calls another user set with CLIP, the calling user's information is restricted to the called user, as CLIR has precedence over CLIP.

- **CLI Routing**

The CLI routing feature allows special processing of incoming trunk calls according to the caller number.

When entering a calling number, you can use wild cards (entered by *) to enter multiple numbers at a time.

Incoming trunk calls with caller numbers only and without caller names can be supported by caller name.

Incoming calls from specified callers can be rejected.

Incoming calls from specified callers can be assigned called numbers, regardless of the called DID numbers. Called numbers can also be assigned by time period.

Time periods are defined by ring plans. For more information, see the section on 'Ring Plans.'

Direct Inward Dialing (DID)

The Direct Inward Dialing (DID) feature allows incoming trunk calls to be directed to different called numbers according to the DID number.

When entering a DID number, you can use wild cards (entered by X) to enter multiple numbers at a time. The system also performs translation of the DID number so that the DID number can be used as the called number.

The called number according to the DID number can be assigned with the user number, the hunt group number, the ACD group number, and various feature codes, including the VMS access code and access code + external number. They can also be assigned by time period. Time periods are defined by ring plans. For more information, see the section on 'Ring Plans.'

Directory Service

IPX-S300B provides Directory Service that user can search subscriber's name or number.

If User wants save result in phone-book, IPX-S300B provides that service.

If using name, at least 2 letter input must be required.

If using number, at least 3 letter input must be required.

Directory Service provides Single Phone User, Hunt Group Number, System Speed Dial Index.

Direct Trunk Selection

IPX-S300B supports Direct Trunk Selection to use a specific trunk, which provides services according to a status of the designated trunk. This is a service only for the FXO of a Gateway.

Emergency Group

If user dials predefined emergency group number in an emergency situation then it is dialed to access code of emergency type automatically. After connecting with the opponent, it is connected to configured managers of emergency group at the same time.

History Log

IPX-S300B provides history logging capability for the events like a SPAM call, call logging, paging on answer call, wakeup call, feature set, registration fail, dispatch call, notice board etc.

Some Logging Services are provided for specific user.

Home Worker Support

IPX-S300B provides the same user services to home workers. The services are provided whether the home worker's phone is connected to the public IP network or to a private IP network within NAT (an IP router).

For a phone connected to a private IP network on NAT, the source port number used for transmitting SIP messages must be symmetric or can be set as symmetric.

The IPX-S300B provides a built-in SBC function.

Hotel Service

This is the hotel service function.

Please refer to the ‘SCM Express PMS Interoperability Guide’

PMS Interface

This is the PMS interface function.

Please refer to the ‘SCM Express PMS Interoperability Guide’

Hot Desking

The hot desking feature allows a user to log in from a phone shared by multiple users.

The user can use a phone in the logged out status to enter his/her ID and password to log in and use the phone as his/her own phone until logged out. A logout button is included in Samsung phones’ soft buttons. Pressing this logs the phone out.

If the user leaves the phone without logging it out, it is automatically logged out after a set period of time, preventing unauthorized users from using the phone. The default login expiration time is 8 hours.

If the user is already logged in through a phone but requests for login again through another phone using the same user ID, the new login request is processed by logging the previous phone out.

Hot Line and Warm Line

The hot line feature allows automatic connection to a specified number when the handset of the selected phone is lifted.

If the call is connected without delay when the handset is lifted, it is called a hot line.

If the call is automatically connected when the handset is lifted but no number is dialed for a set period of time, it is called a warm line.

Hunt Group

The hunt group service directs calls received by the pilot number of a hunt group appropriately within the hunt group using various routing methods.

When calls are received for a hunt group, the available member list excludes members unable to receive calls because they are unavailable, are subject to incoming call restriction policies, have logged out of the system, have user information that is locked out, or do not have their phones connected.

Called parties for calls received for a hunt group are determined in the following four ways.

- Sequential
The call is always directed to the first member in the hunt group. The call is directed to the next member only if the previous member is on the line or unavailable.
- Circular
When a call is received for the hunt group, the call is directed to the person on the hunt group member list after the one who answered the previous call. If the member to whom the call is directed is on the line or unavailable, the call is directed to the next member.

- **Parallel or Broadcast**
The call is directed to all the members in the hunt group. When one of the members answers the call, the call is canceled for all other members.
- **Random**
The call is randomly directed to one member in the hunt group at random.
- **Hunt Group Login/Logout**
You can temporarily prevent a hunt group member from receiving incoming calls for the hunt group. If a member logs out of his or her hunt group, the member is excluded from the available member list, and incoming hunt group calls are not directed to the member.
If the member logs in again, he or she can receive incoming hunt group calls normally.

Location-based Codec Negotiation

- **Location**
Codec negotiation takes place between two Internet phones when a call is made between them using the SIP protocol. IPX-S300B can change codec priority by intervening in the codec negotiation process.
You can specify the default audio codec, the default video codec, and the announcement codec for each location in order to change the priority of the codec list between the calling phone and the called phone.
As you set Forced Audio Codec, the codec negotiation can be forced with the codec you want within or between locations.
- **Default Audio Codec**
When IPX-S300B receives a sent message, IPX-S300B finds the default audio codec set for the calling phone's location in the audio codec list of the sent message and moves it to the top-priority position of the list before resending the message.
Codec negotiation is performed as the specified audio codec is selected by the called phone if it can service the codec.
This process is skipped if the default audio codec set for the location is not found in the codec list of the sent message.
- **Forced Audio Codec**
When IPX-S300B receives a sent message, IPX-S300B checks whether the calling phone supports the codec which set as Forced Audio Codec. IPX-S300B send the message to a called phone with only the codec if the calling phone supports that, or rejects the call.
- **Default Video Codec**
When IPX-S300B receives a sent message, IPX-S300B finds the default video codec set for the calling phone's location in the video codec list of the sent message and moves it to the top-priority position of the list before resending the message.
Codec negotiation is performed as the specified video codec is selected by the called phone if it can service the codec.
This process is skipped if the default video codec set for the location is not found in the codec list of the sent message.

- **Announcement Codec**

IPX-S300B can connect its sound source to the phone put on hold during a call and play an on-hold tone. It can also play an announcement for the phone of the calling party in case of call failure or any other errors.

When IPX-S300B sends a sent message for connecting the sound source to the phone for which an on-hold tone is played while the call is put on hold or an announcement is played for an error, IPX-S300B moves the announcement codec set for the phone's location to the top-priority position of the audio codec list in the sent message before resending the message.

Codec negotiation is performed as the specified audio codec is selected by the called phone if it can service the codec.

Multiple Appearance

There are the following two multiple appearance services: assigning one phone number to multiple phones, or assigning multiple phone numbers to one phone.

These two services can be set independently or collectively.

- **Multi-Device**

The multi-device service assigns one user (phone number) to multiple devices (phones).

IPX-S300B performs the service regardless of the phone being used. One phone number can be assigned to maximum of 32 phones regardless of the phone type.

- **Multi-Number**

The multi-number service assigns multiple users (phone numbers) to one device (phone).

The service is performed collectively by IPX-S300B and by the phone. Since the phone must be able to differentiate the lines and select them, the maximum number of phone numbers allowed varies by the phone type. In case of SMT-i5243, the phone with the most service capacity, up to 10 phone numbers can be assigned per phone.

Music On Hold

When a call is put on hold, IPX-S300B can connect its built-in sound source and play a tone or music for the phone or the trunk.

It is necessary to enable or disable MOH for each user group because there are limited number of channels for IPX-S300B's built-in sound source device. When there are too many calls put on hold, the MOH may not be played for some of the calls. In this case, it might be better not to play the MOH at all than to have the MOH played for some calls while the MOH is not played for other calls.

Missed Call Display

Missed Call Display is a notice service to the phone to inform the call is answered by other user. IPX-S300B can activate or de-activate the function for the Multi-Device Calls, Hunt Group, Multi-ring calls and Pickup.

Operator Group

An operator group is a special hunt group made up of members who act as operators. Different hunt groups can be specified as operator groups by time periods. In general, a user selected as a member of an operator group uses the phone in parallel to a PC application or uses a PC-based soft phone.

- Operator Recall

When a call is transferred or parked and then directed back to the original called party but the connection was not established, the operator recall service directs the call back to the operator group.

Calls are redirected to the operator group in the following cases:

- Reconnection failure after call transfer failure: When call transfer fails for an incoming call for an extension number, the call is redirected to the extension number. Here, if the call is not answered by the extension number, it is redirected to the operator group.
- Reconnection failure after call park: When an incoming call for an extension number is put on hold (call park) and the call is not answered for a set period of time, the call is redirected to the extension number. Here, if the call is not answered by the extension number, it is redirected to the operator group.

Registration management

On the IPX-S300B, you can check the current registration status of phones, trunk routes and applications.

Ring Plans

When processing calls on a PBX, it is often necessary to provide different services for different days of the week or time of the day. Different services also may be required for public holidays. To accommodate such needs, the services are configured for different days of the week, different time of the day, and different dates. But the problem is that the settings become too complicated.

IPX-S300B provides different services for different days of the week, different time of the day, and different dates by utilizing a feature known as ring plans. IPX-S300B supports a total of 11 ring plans, including the 10 ring plans (ring plans 1 through 10) which can be assigned their own dates, days of the week and time of the day, and the default ring plan which is used when none of the former 10 ring plans is applied.

- Calendar Exceptions

To use ring plans, IPX-S300B refers the calendar which is made when a user group is created for maximum of 20 years.

Each day assigns to a day type from Monday to Sunday, Weekday and Weekend as a default. For a site, the special day types can be assigned to some days to provide different services according to the day type. IPX-S300B provides four day type, Holiday1, Holiday2, User1 and User2.

- Ring Plan Schedule

A ring plan schedule is a table containing data which specifies ring plans by days of the week, dates, and time of the day.

- **Holiday Ring Plan Schedule**
A holiday ring plan schedule is a table containing data which specifies ring plans by a designated day type for the site.
- **Ring Plan Override**
IPX-S300B provides a manual override service which allows temporary use of a particular ring plan regardless of the current time. When using ring plan override, you can use the override temporarily by specifying an expiration time or use it permanently by not specifying an expiration time.

Group Call Forward

This service is used for forwarding all incoming calls for all the phones in a group to another number according to the ring plan. If Group Call Forward is activated by Feature Code, it overrides the forward number by ring plan. Group Call Forward can follow the ring plan only when Forced Group Call Forward by Feature Code is deactivated.

Service Group Local Number

Extension Number is a base number to make a call. Service Group Local Number is a kind of shortcut number of the extension number in a specific Service Group. If the extension numbers in a service group starts with a same prefix, the number except the prefix can be used for shortcut number to dial.

System Call Forward

This service performs call forwarding based on the system settings. In case that user sets his Call Forward All and Preset Call Forward All service is set, Call Forward All based on the settings made by User is performed.

- **Preset Call Forward All**
This service performs preset call forward all based on the settings made by the system administrator even if preset call forward busy is not set by users.
When any call is placed on called user, this feature can be used to forward the call to the voice mail system for voice announcement, etc.
If the user has set call forwarding, the user settings have precedence over the system call forward settings. In other words, if the user has set call forward all, the preset call forward all setting is ignored.
- **Preset Call Forward Busy**
This service performs preset call forward busy based on the settings made by the system administrator even if preset call forward busy is not set by users.
When the called user is busy, this feature can be used to forward the call to the voice mail system for voice announcement, etc.
If the user has set call forwarding, the user settings have precedence over the system call forward settings. In other words, if the user has set call forward all or preset call forward busy, the preset call forward busy setting is ignored.

- **Preset Call Forward No Answer**
This service performs preset call forward no answer based on the settings made by the system administrator.
When the called user does not answer a call, this feature can be used to forward the call to the voice mail system for voice announcement, etc.
If the user has set call forwarding, the user settings have precedence over the system call forward settings. In other words, if the user has set preset call forward no answer, the preset call forward no answer setting is ignored.
- **Preset call forward Unreachable**
This service performs preset call forward unreachable based on the settings made by the system administrator.
If the call forward Unreachable service is enabled for a user, all incoming calls for the user are automatically forwarded to a specified number when the user's phone is not registered, does not respond to signaling, or otherwise unavailable.
If the user has set call forwarding, the user settings have precedence over the system call forward settings. In other words, if the user has set call forward unreachable, the system preset call forward unreachable setting is ignored.
- **Preset call forward DND**
This service performs preset call forward DND based on the settings made by the system administrator even if preset call forward DND is not set by users.
When the called user set up DND service, this feature can be used to forward the call to designated Number by system administrator.
- **Announcement for Call Forward**
When a call set up because of Call Forward, IPX-S300B sends announcement before the real ring back. This service makes the caller knows the call is forwarded.
Default announcement is Announcement ID 1203.
- **Group Call Forward**
IPX-S300B can forward calls for multiple users to one common number by date, day of the week or time of the day according to the system administrator settings.
This is call group call forwarding.
Applying the dates, days of the week, time of the day for group call forwarding is done by ring plans. For more information on ring plans, see the **[Ring Plans]** section.

System SPAM Call Block Service

The IPX-S300B provides a function to reject incoming trunk calls from the same caller number during a specified period of time.

VoIP Security

- **Signaling Encryption**
The signaling encryption feature encrypts signaling information required for calls such as the SIP protocol. TLS is used in signaling encryption for VoIP connections between IPX-S300B and SIP phones and between IPX-S300B and endpoints. Specifications of TLS serviced by IPX-S300B are as follows:
 - Uses OpenSSL library and supports TLS v1.2.
 - AES and ARIA are supported as media encryption algorithms.
 - Key management method is RSA and key length is 1024 bits.

Signaling encryption is not used for calls between phones or endpoints enabled with encryption and phones or endpoints not enabled with encryption.

- **Media Encryption**
The media encryption feature provides encryption for the voice data exchanged between the caller and the callee for calls established with signaling encryption. Media encryption can be enabled to calls between SIP phones or between a phone and an endpoint by applying secure RTP (sRTP), in which case, IPX-S300B performs signaling for sRTP. IPX-S300B supports media encryption for calls with phones, IPX-S300B's built-in conference system, IPX-S300B's built-in voice mail system, and endpoints, but not with IPX-S300B's built-in MOH system. IPX-S300B supports AES and ARIA as media encryption algorithms.

ARIA is a block encryption algorithm developed in Korea in 2003 for protection of information for public administration services. This is used as the TLS and sRTP encryption algorithm.

Media encryption is not used for calls between phones or endpoints enabled with encryption and phones or endpoints not enabled with encryption.

Feature Services

- **Class Of Service (COS)**
IPX-S300B allows the administrator to set privileges for each user. Since setting service privileges for all the users individually could be very complicated, Class of Service can be created with their own set of service privileges and users can be assigned to their appropriate Class of Service.
When a user group is created, a default service group is automatically created for the user group. If you wish to apply a different Class of Service than the default Class of Service, you can create a new Class of Service and use it.
Each Class of Service can be set with different service privileges. It also supports override levels and privacy levels, whereby a particular service is provided only if the overriding user's override level is higher than the privacy level of the user being serviced.

The services involving override and privacy levels include the DND override feature and the barge-in with/without tone feature.

- Service List

The administrator can assign privileges for Class of Service or individual users for use of the services.

- Feature Codes

A user can use features in one of the following four ways:

- The administrator enables a feature for the individual user.
- The user enables a feature on IPX-S300B Personal Assistant.
- The user presses a feature button on the phone.
- The user dials a feature code from the phone.

If the user wishes to use a feature temporarily without having it configured in advance, the user must use a feature button or a feature code.

Since IPX-S300B uses a standard protocol between phones and IPX-S300B, arbitrary feature buttons cannot be created. Therefore IPX-S300B uses feature codes when configuring features or when using features temporarily. If you press a feature button on a Samsung phone, IPX-S300B is also designed to process the feature code assigned to the feature button.

Feature codes can be configured for the following service types. When used in pairs—such as for enable and disable, request and cancel, and login and logout—two feature codes are registered.

- Feature Code + 1: Feature codes for enable, request, login, etc.
- Feature Code + 0: Feature codes for disable, cancel, logout, etc.

User Authentication

IPX-S300B can limit its service to allow only those users who passed a series of authentication process to receive the service. For user authentication, IPX-S300B provides the HTTP Digest Authentication described in RFC3261 and RFC 2617, and Local Authentication and Remote Authentication methods are provided for the User Authentication function.

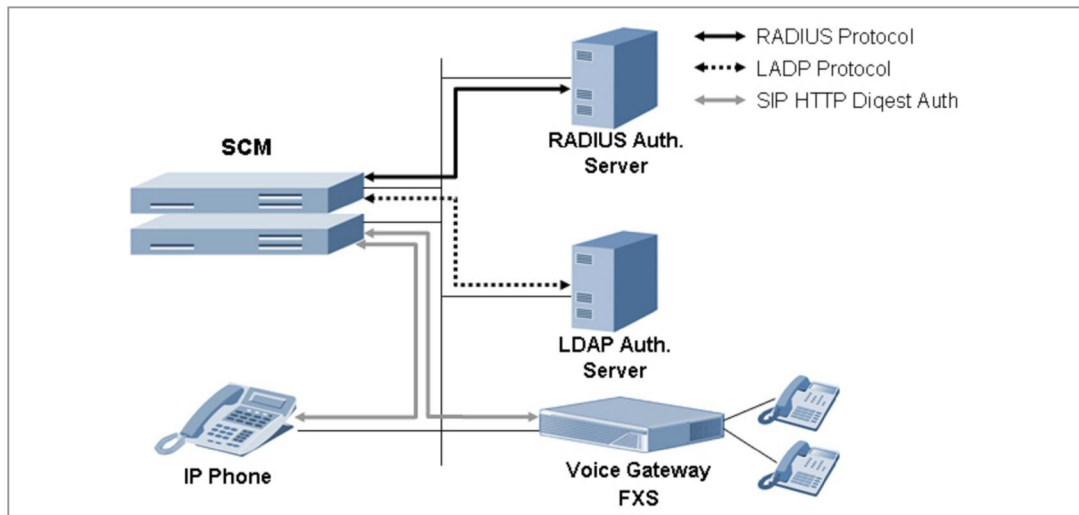


Figure 17. User Authentication

- Local Authentication
IPX-S300B performs internal authentication in the following order:
The SIP phone transmits REGISTER without authentication header to IPX-S300B.
IPX-S300B transmits 401 Unauthorized with challenge information to the SIP phone.
SIP phone transmits REGISTER without authentication header to IPX-S300B.
After IPX-S300B executes Digest Authentication, it transmits 200 OK to the SIP phone.

Boss/Secretary

The boss/secretary feature allows a boss and a secretary to share one user number while using their own individual numbers and the intercom feature. Bosses and secretaries can be connected 1:1 or M:N using multi-device and multi-line feature.

Busy Lamp Field (BLF)

IPX-S300B provides the Busy Lamp Field (BLF) service which indicates the status of a particular service or the status of the user number using the LED on the buttons of the phone.

- Line Monitoring
This can monitor other parties' status by mapping the extension of the person to monitor to the button.

When the status is Idle, the call is made to the person by pressing the button.

When the other party's call is ringing, Direct Pick can be performed by pressing the button.

When the other party is on the phone, can Barge In by pressing the button.
(when having the Barge In authority)

- Speed Dial

When pressing the button, a call is made to the registered dial number.

- Line

Same to the right line button of a phone. When the button is pressed, the line that is pre-assigned is seized then waits for the user's dial input.

DTMF Detection Services

During a call between SIP phones on an IP PBX, all data except SIP signaling for call connection is exchanged by the phones. Therefore, the numbers dialed for services-except the phone number included in the INVITE message for call connection-cannot be sent to the system using the standard protocol.

In order to receive the numbers dialed on the phone-except the INVITE message-IPX-S300B connects the call to its built-in voice announcement system and collects the numbers dialed on the phone according to the voice announcement.

User interaction services provided in this way include account code, call authentication code, and DISA user authentication.

- Account Code

This feature allows the user to enter his/her account code in the account information when making an external call through the trunk. Account codes can be entered in the following two ways.

- Forced Account Code

When a trunk call is made from a phone set with forced account code input, a registered account code must be entered. The account code entered will be saved in the charging data record (CDR), which can be used for calculating call charges for the user.

- Voluntary Account Code

When a trunk call is made from a phone set with voluntary account code input, you can press the account code button and enter an account code in advance before making the call, or you can put your current call on hold, press the account code button, enter an account code, and then reconnect the call on hold. The account code entered will be saved in the charging data record (CDR), which can be used for calculating call charges for the user.

When a trunk call is made on a phone set with forced account code input, actions are performed in the following order:

The user dials an access code and an external number.

If the user's phone is set with forced account code input, SCM connected the call to its built-in voice announcement system.

The voice announcement system plays an announcement for the user to enter a registered account code.

The user enters an account code as instructed. The voice announcement system verifies that a valid account code has been entered.

If the account code entered is valid, IPX-S300B uses the access code received in step (1) to select a route and makes a call for the external number specified.

If the account code is invalid, IPX-S300B plays an error announcement and terminates the call.

- **Authorization Code**

Those users restricted from making external calls can make external calls by dialing the number for the built-in voice announcement system which authenticates external calls.

When a user restricted from making external calls attempts to make a trunk call by using a call authentication code, actions are performed in the following order:

The user dials the number for the call authentication system.

IPX-S300B connects the call to the call authentication system.

The voice announcement system plays an announcement for the user to enter a registered call authentication code.

The user enters a call authentication code as instructed. The voice announcement system verifies that a valid call authentication code has been entered.

If the call authentication code entered is valid, IPX-S300B temporarily suspends the external call restriction set for the user.

The user can now dial an access code and an external number and the trunk call will be made.

The authentication code entered will be saved in the charging data record (CDR), which can be used for calculating call charges for the user.

- **DISA User Authentication**

When using the Direct Inward System Access (DISA) feature, the user can call IPX-S300B from outside to get authenticated as instructed by the voice announcement so that he/she can make a trunk call through the system.

When there is an incoming DISA call, IPX-S300B connects the call to its built-in DISA user authentication announcement system and plays a voice announcement for the external caller.

System Speed Dial

This feature allows you to assign a two-digit or longer shortcut number to a phone number frequently dialed not by individual users but by all users of the system. If a lengthy phone number is mapped to a System Speed Dial number, users can access the destination just by dialing the shortcut number.

Local Based Number Translation

IPX-S300B provides Local Based Number Translation, between users' call belonging same location.

In same location, user can use virtual extension number.

Basic Announcement

IPX-S300B provides basic announcement messages on users such as ‘The dialed number you have dialed is not in service’, and additional services such as notification for the user being unavailable to answer the call, Music On Hold, etc. by using the Built-In MOH function.

Computer Telephony Interface (CTI)

CTI provides call control and event reporting functions through IPX-S300B CSTA (Computer Supported Telephony Application) interface.

Digit Analysis and Numbering Plan

The digit analysis function is a process of deciding how to handle the incoming call by analyzing the digits dialed. When a call is generated, it first compares the digits dialed with DN (Directory Number) list of the user. If two numbers match, then the system recognizes the call as an internal call. And if not, the system compares again the dialed number with access code for call routing. If the two numbers match, the system considers it as a service call. And if not, the system compares again the dialed number with access code for call routing. If the dialed digits correspond to the call routing access code, then the call is handled according to the call routing procedures. If the dialed digits don't match any of mentioned numbers, then the system considers it as an incorrectly made call and rejects the call.

Fax over IP

IPX-S300B supports SIP signaling regarding T.38 Fax.

DTMF

IPX-S300B supports INFO method, NOTIFY method, and RFC2833 to either send or receive DTMF event to/from a user terminal or Voice Gateway system.

Privacy

Privacy operates as a defensive function against DND Override and Barge In services. When the user's Privacy level is higher than the Override level of the other users who attempt DND Override or Barge In, both DND Override and Barge In do not occur.

Survivable Telephony Support

IPX-S300B supports the Survivable Telephony function provided in Voice Gateway.

User Group

The User Group Function allows a separate grouping of the system users thus enabling various added services to be used independently among groups. Each User Group has a separate dial plan, and the User numbers allocated for User Groups can be overlapped.

- **Service Group**
In concept, this is a Sub-Group of the User Group, and there are several Sub-Groups within one User Group to use for various added services. The functions using service group include Call Limiting between service groups, Route Occupation Limiting per service group, call statistics per service group, etc.
- **Inter Service Group Restriction**
The operator may limit the calls between service groups by using this function. If a restriction has been set between service group A and B, a guidance message notifying that the call is restricted is played to a user of group A when he/she is calling a person in group B.

Wireless Enterprise Service

Wireless Enterprise Service is VoIP (Voice over IP) Service in FMC (Fixed Mobile Convergence) using WiFi of the smartphone user.

Remote Dial

When a WE VoIP subscriber attempts to use the office phone while outside the Wi-Fi network, the WE VoIP subscriber can request the IPX-S300B for remote dialing service over the data channel.

When a remote dialing service request is received, the IPX-S300B calls the WE VoIP subscriber over the 3G network. When the subscriber answers the call, the system places an outgoing call to the number originally entered by the WE VoIP subscriber and connects the call.

Mobile DISA

When the WE VoIP subscriber attempts and fails a mobile remote dialing service, the WE VoIP subscriber can place the outgoing mobile DISA call over the 3G network to enable the DISA function.

After ending the outgoing mobile DISA call placed by the WE VoIP subscriber, the IPX-S300B places an outgoing 3G call to the WE VoIP subscriber's mobile number. When the subscriber answers, the system collects the number and connects the outgoing call.

Call receiving in mVoIP Zone

This function determines whether to allow extension call receiving for WE VoIP subscribers located in mVoIP zones.

Mobile Number Automatic Update

This function determines whether to automatically update the mobile number of the FMC terminal with the mobile number included in the registration message used during terminal registration.

Internal Proxy Function

This function is used for TLS connection management distribution of extension phones using the TLS protocol.

LDAP Server

The LDAP server uses the internal database of the IPX-S300B to provide information to the LDAP client.

LDAP Client

For system load and network management, the IPX-S300B assigns different access privileges to users accessing the LDAP server according to their levels.

System SPAM Call Block Service

The IPX-S300B provides a function to reject incoming trunk calls from the same caller number during a specified period of time.

Changing Distinctive Ringtone

Caller-specific ringtones can be selected from a range of ringtones available for the terminal using Admin.

Unencrypted Communication Restriction

Non-sRTP calls which are not encrypted can be restricted.

Simultaneous Ring Delay for Desktop Phone

When WE VoIP, 3G mobile phone, and desktop phone are set to ring simultaneously, it is possible that the call is answered in proxy even before the WE VoIP or 3G mobile phone starts ringing because the desktop phone starts ringing earlier.

This function makes the desktop phone start ringing later.

Speed Dial ID Display

This function displays the personal speed dial name on the caller's phone when placing an outgoing trunk call.

Extension Group Member Service

When there is an incoming call for users in an extension group through the representative number, all call forwarding, multi-ring and group call forwarding settings are ignored and the call is put through.

Ring Plan

The IPX-S300B supports creation of up to 20 ring plan schedules, each of which can have up to 16 ring plans in total including 15 ring plans that are assigned by date, day of week, or hour (ring plans 1-15) and a default ring plan that is used in hours not covered by any other ring plan.

Other User MWI

This function allows the user to check for new voice mails in the inbox of another extension number and even connect to the inbox and listen to the voice mails by pressing the button.

User Timer Option

This function allows the operator to change the current configuration status of each individual user's service timer.

Call Restriction by IP Range

This function allows call restriction of subscriber calls originating from a specified IP range through the SBC interface.

Changing Distinctive Ringtone

This function allows caller-specific ringtones to be selected from a range of built-in ringtones supported by the terminal.

GW Channel Display

The gateway channel information display function displays gateway channel information of the current user.

Move to Mobile

The current call can be transferred to another phone without putting it on hold for continuous call conversation.

- Call move using soft menu
- Call move using phone button
- Call move using call move button
- Fetching moved call

No Ring

The no ring function prevents the phone from ringing when there is an incoming call. This service is useful for keeping some of the phones silent when multiple phones are ringing simultaneously due to multi-ring or multi-device functions.

Multicast Paging

It provides a paging feature using multicast. In the case of internal paging through a previously existing conference server, a maximum of 128 people per group is supported. Now, it supports a maximum of 512 people.

The multicast paging host can be broadcasted by pressing the multicast code and the group number. The service by pressing only the group number is also supported.

In IPX-S300B, if a member is taking a call and could not receive the multicast paging request, the member can receive the multicast paging after the call is ended. Also, when more than one multicast paging is on hold, the multicast paging requested first will be received. The telephone version must be checked for this.

System Information Display on Device

It offers a feature to check the system information on an IP phone.

- Supporting device model: SMT-i6000 Series

The system Information that can be checked on an IP phone is as follows.

- The version of the system by each module is displayed.
- The network setting information of the system is displayed.
- The setting type and the card status of the system by each slot are displayed.
- The registration status of telephones and gateways, which are interworking with the system, are displayed.
- Additional information of the system is displayed.

E911 Service

It provides the PSAP (Public Safety Answering Point) with the caller ID in an emergency call so that they can identify the location of the emergency caller.

CHAPTER 5. User Features

A user service is only available to the users authorized to that service. The authorization to a service is described in the format of Class of Service. The Class of Service can be assigned to a user and the user can use the services defined in it.

A user can set his or her services using SCM Personal Assistant.

Absence

The absence feature is used for notifying that the user is absent. If the absence feature is enabled, when there is an incoming call, an announcement is played to notify the caller of the absence status and the call is terminated.

Auto Answer

The auto answer feature is used when the user wishes to have his/her incoming calls answered automatically. If the auto answer feature is enabled, when there is an incoming call, the speaker will be turned on and the call will be answered automatically.

Automatic Retry

When the user makes an outgoing trunk call but the called party is busy or does not answer the call, the automatic retry service can be used to automatically redial the number after a set period of time. If the automatic retry is enabled, the phone's speaker is automatically turned on at a set interval and the last dialed number is dialed again.

Barge-In

This feature allows you to intrude into a user's current call for a three-way conference call. The Barge In feature is also known as Call Intrusion or Call Override.

The Barge In feature is provided with warning or without warning depending on whether the user is notified that the call has been intruded into. IPX-S300B services both types of the feature.

IPX-S300B uses its VPU option card for three way conference calls. IPX-S300B does not support the barge in feature though its built-in conference system.

Therefore, the basic settings for using the VPU conference must be configured.

- **Barge-In with Tone**
When you intrude into a call and establish a three-way conference, this service periodically plays a tone to notify the user being intruded into that the call has been intruded into.
- **Barge-In without Tone**
When a three-way conference call is established by intruding into a call, the user being intruded into is not given any notification and the intruding user's voice is muted so that the call can be monitored in secret.

Change Password

The change password feature is used when the user wishes to change his/her password for using function.

Call Forward

When there is an incoming call, this feature is used for forwarding the call to another number specified by the user.

- **Call Forward All**
If the call forward all feature is enabled for a user, all incoming calls for the user are automatically forwarded to a specified number.
Even if the user has not enabled call forward all, the administrator can configure all incoming calls for the user in specific time periods to be forwarded to another number. For more information, see the 'System Call Forward-Group Call Forward' section of '4. System Features.'
- **Call Forward Busy**
If the call forward busy feature is enabled for a user, incoming calls for the user while the user is busy are automatically forwarded to a specified number.
Even if the user has not enabled call forward busy, the administrator can configure the incoming calls for the user while the user is busy to be forwarded to another number. For more information, see the 'System Call Forward-Preset call forward Busy' section of '4. System Features.'
- **Call Forward No Answer**
If the call forward no answer feature is enabled for a user, the incoming calls for the user which are not answered for a specified period of time are automatically forwarded to a specified number.
Even if the user has not enabled call forward no answer, the administrator can configure the incoming calls not answered by the user to be forwarded to another number. For more information, see the 'System Call Forward-Preset call forward No Answer' section of '4. System Features.'
You can use PWP to set the time period for each user which is used by the call forward no answer service to determine the user's an incoming call as an unanswered call and forward it to a specified number. If call forward no answer is enabled by pressing the feature code on the phone, the default time of 15 seconds is used.

- **Call Forward Unreachable**

If the call forward Unreachable service enabled for a user, all incoming calls for the user are automatically forwarded to a specified number when the user's phone is not registered, does not respond to signaling, or otherwise unavailable.

Selective Call Forward

This service only forwards a user's incoming calls from specified numbers. Selective call forward can be serviced in the following two ways.

- **Selective Call Forward Allowance**

If this feature is enabled, only the calls from specified numbers are forwarded and calls from unspecified numbers are not forwarded.

- **Selective Call Forward Restriction**

If this feature is enabled, the calls from specified numbers are not forwarded and calls from unspecified numbers are forwarded.

Call Hold

Call hold and Retrieve function allows a user to hold the call that is currently on line, attempt to make a new call and also reconnect to the original call. If the person on the other line is using specific services, (Ex.: call hold, conference, etc.) the call hold function cannot be used.

Call Park

The call park feature allows the user to park the current call so that it can be picked up on another phone by pressing the button or the feature code.

A park ID is a key to distinguish each call, so that the call can be identified when picked up. There are the following two types of call park service depending on the park ID input method.

- **Park Extension**

The park extension service can be used by using an extension number as the park ID. Since an extension number is used as the park ID, only one call can be parked per extension number.

- **Park Orbit**

The park orbit service can be used by using an independent orbit park number as the park ID. Since independent numbers are used as the park ID, multiple calls can be parked for each extension number. Therefore, this feature is useful for users who need to park many calls, such as operators.

- **Parked Call Pick-up**

This feature allows a parked call to be reconnected on the phone for it had been parked or on another phone.

- **Park Recall**

This feature allows a parked call to be redirected to the user who parked the call if the call is not picked up after a specified period of time.

In case of a trunk call, if the redirected call is not answered, the call is redirected to the operator. For more information, see the ‘Operator Group-Operator Recall’ section of ‘4. System Features.’

Call Pick-up

This feature allows the user to answer another user’s incoming call. Call pick-up can be serviced in the following two ways.

- **Direct Call Pick-up**

This feature allows you to pick-up another user’s incoming call by specifying the user’s number.

The user can press the direct call pick-up feature code + the number of the user whose phone is ringing to pick-up the other user’s incoming call which is currently ringing.

- **Group Call Pick-up**

If this feature is enabled, you can specify a call pick-up group number (instead of a user number) for which an incoming call is ringing to pick-up the current incoming call for the selected group. You can also pick-up an incoming call ringing for your own call pick-up group.

The user can press the group call pick-up feature code + the number of the call pick-up group whose phone is ringing to pick-up the group’s incoming call which is currently ringing. Or, the user can dial just the group call pick-up feature code without a call pick-up group number to pick-up the current incoming call for his/her own call pick-up group.

Outbound Call Lock

The Outbound Call Lock feature allows a user to request for restriction of outbound trunk calls from his/her own number.

Call Transfer

The call transfer feature allows the user to put on hold the current call and transfer it to another number. If call transfer fails, the call is reconnected to the user who transferred the call.

- **Transfer Type**

The user can transfer calls in the following three ways.

- **Blind Transfer**

This feature allows the user to transfer the call directly to another number without hold it. Although IPX-S300B and Samsung SIP phones support blind transfer, this has the same effect as semi-blind transfer from the user’s point of view.

Therefore no separate feature code is defined.

- Semi-Blind Transfer
This feature allows the user to put on hold the current call by pressing the transfer button, call another number, and then transfer the call by pressing the transfer button while the phone is ringing.
- Consultative Transfer
This feature allows the user to put on hold the current call by pressing the transfer button, call another number, and then transfer the call by pressing the transfer button again after the call is established.
- Transfer Recall
This feature allows the transferred call to be redirected to the user who transferred the call when call transfer fails or when the transferred call is not answered.
If the user to whom the call is transferred does not answer the call during this period of time, the call is redirected to the user who transferred the call.
If the redirected call is not answered, the call is redirected to the operator. For more information, see the ‘Operator Group-Operator Recall’ section of ‘4. System Features.’

Call Waiting

If the call waiting feature is enabled, when there is an incoming call while the user is already engaged, the call is not terminated as a call when busy, but instead the user is notified that a call is waiting so that the user can park or end the previous call and pick-up the new call.

If there is an incoming call while the user is already engaged, a brief call waiting tone will be played for the user. If the user presses the call button to answer the new call, the previous call is automatically held.

If the call waiting feature is enabled for a phone, the phone can receive all the calls it can accommodate. But if the call waiting feature is not enabled, all incoming calls while the phone is engaged are terminated as calls when busy.

If the call waiting feature is enabled for a phone, the phone can accommodate as many calls as the call buttons configured. If no call button is configured, all incoming calls while the phone is engaged are treated as calls when busy.

Call Intercept

Call Intercept can be provided under the 3-way conference by the Barge-In service. A User can make 2-way call with the party which is barged in by pressing Call Intercept soft key.

Forced Call Release

Forced Call Release can be provided under the 3-way conference by the Barge-In service. By pressing Force Call Release soft key, a user can make 2-way call by releasing the party barged in.

Callback

When a user calls another user but if the called party is busy or does not answer, the caller can enable the callback feature so that when the called party becomes available, the caller's phone will ring, and if the caller answers the phone, the called party number is redialed.

- **Callback Busy**
The Callback Busy function is for connecting the calling and called users by generating a call to both parties when the called user for whom the IPX-S300B is scheduled becomes idle after the calling user has requested a callback to the called user whose line was busy in the first instance.
- **Callback No Answer**
The Callback No Answer function is used for connecting the calling and the called users by generating a call to the both parties when the line status of the called user for whom the IPX-S300B is scheduled becomes busy then returns to idle after the calling user has requested a callback to the called user who did not answer in the first instance.

CLI Control

- **Temporary CID Restriction**
The temporary CID restriction feature allows the user to request that his/her number is not shown to the called party for a particular call.
When making a call, the user can dial the temporary CID restriction feature code + called party number to request temporary CID restriction.
- **Distinctive Ring by CLI**
The distinctive ring by CLI feature allows incoming calls to be distinguished by ringing different rings depending on the caller numbers.

Do Not Disturb (DND)

When Do Not Disturb (DND) feature is enabled for a user, IPX-S300B rejects all incoming calls for the user. When there is an incoming call for a user with DND, an announcement is played to notify the caller of the DND status and the call is terminated.

- **DND White List**
When there is an incoming call for a user with DND, this service prevents the call from getting rejected if the call originates from one of the caller numbers specified in advance.
The user can use the **[DND White List]** menu on SCM Personal Assistant to register a list of caller numbers to exclude from the DND service.
- **DND Override**
When there is an incoming call for a user with DND, this service allows the caller, while listening to the DND announcement, to ignore the DND status and have his/her call connected.
To use the DND override feature, both 'Override Level' and 'Privacy Level' must be defined in Class of Service. DND override is allowed only when the override level is higher than the privacy level. The override level is applied to the user overriding DND and the privacy level is applied to the user with DND.

Follow Me

When the caller has temporarily moved to another location, this service allows the caller to answer all incoming calls to his number by using another phone.

Individual Speed Dial

A user can register one-digit Individual Speed Dial IDs as shortcut numbers to frequently dialing numbers. By dialing these IDs, a user can dial to the destinations.

Intercom

When a call is made between the users for whom intercom is enabled, the call is automatically answered through the speaker. When using the manager/secretary feature, the intercom feature is used together.

Language Selection

This service allows the user to change the language displayed on their phone. The user can use the **[My Info]** menu on SCM Personal Assistant to change his/her language.

Last Call Redial

The last call redial feature allows the user to redial the caller or the called party number of the most recent call.

- Last Outgoing Redial
The last outgoing redial service allows redialing the called number of the last outgoing call.
- Last Incoming Redial
The last incoming redial service allows redialing the called number of the last incoming call.

No Ring

The no ring feature prevents the phone from ringing when there is an incoming call for the user. This service is applied to prevent some phones from ringing when multiple phones are configured to ring at the same time by features such as multi-ring and multi-device.

Multi-Ring

If the multi-ring feature is enabled, when there is an incoming call for the user, the call is directed to multiple phones at the same time, and when the call is answered by one of the phones, the call is connected to the phone and the ring on other phones are canceled. This service is useful for incoming calls to ring the landline and the mobile phone to ring at the same time.

Mobile Extension (MOBEX)

The mobile extension (MOBEX) feature allows incoming calls to be directed not only to the landlines and mobiles phones registered with IPX-S300B but also to external phone numbers. This is one example of the multi-ring service.

The service also allows the user to answer the call with his/her mobile phone and then when the user returns to the office, the call can be transferred to the landline in the office and be picked up for continued conversation.

- **Call Pick-up on Desk Phone**

This service allows the call answered with an external mobile phone by the multi-ring feature to be transferred to the landline in the office and picked up for continued conversation.

The user can dial the call pick-up on desk phone feature code on the master phone enabled with multi-ring to pick up the call from the mobile phone.

After answering an incoming call with a mobile phone enabled with multi-ring, the user can press the 'MOBEX on Desk Pick up' feature code on his/her master phone during the call to transfer the call to the master phone.

- **Transfer to Mobile Phone**

This service allows the user to transfer a call to an external mobile phone specified as a multi-ring member without parking the call. It works in the same way as blind transfer.

The user can dial press the transfer button on the master phone enabled with multi-ring during a call to transfer the current call to the mobile phone.

To transfer a call, press the transfer button and a mobile phone number on the master phone during the call and end the call.

Remote Office

The remote office feature allows automatic forwarding of all incoming calls for a user to an internal number or an external number specified.

The remote office feature works in the same way as Call Forward feature but it is defined for remote use. It is also similar to the Follow Me feature but it is different in that the calls can be forwarded to phone numbers outside the system.

Wake-Up Call

The wake-up call feature allows the user's phone to ring at a wake-up time specified by the user. If the user answers the call, an announcement is played to notify that it is the wake-up time.

Voice Mail Integration

IPX-S300B's built-in voice mail system is utilized for providing the basic voice mail services including deflection to voice mail, and transfer to voice mail.

- **Message Waiting Indication (MWI)**
This is the function used to notify that there is an unread message by lighting the MWI lamp of the user's extension phone when the message is saved in the user's VM mail box.
- **Deflect to Voicemail**
This service forwards allows the currently ringing call to be forwarded to the voice mail system by using the call forward no answer feature.
The voice mail system answers the call immediately and plays the no answer announcement so that the caller can leave a voice mail.
If the user presses the deflect to voice mail button on the phone which is ringing, the call will be processed for call forward no answer and be connected to the voice mail system.
- **Transfer to Voicemail**
This feature allows the current call to be connected to a specified mailbox in the voice mail system so that the caller can leave a message.
If the current call is transferred to the voice mail system by a normal method, the voice mail system asks for the service code, mailbox number, password, etc. But if the transfer to voice mail feature is used for transferring the call, this step is skipped so that the caller can leave a voice message without entering anything.
When the user dials the transfer to voice mail feature code + a mailbox number during a call and ends the call, the call will be transferred to the voice mail system and the caller will be allowed to leave a voice mail in the selected mailbox.

With VPU option card, more channels and advanced services are supported. It provides basic services utilized by built-in voice mail system as well as advanced services such as answering machine emulation and call recording.

Answering machine emulation and call recording services are provided as three-way conference calls. IPX-S300B utilizes its VPU option card for establishing three-way conference calls.

- **Answering Machine Emulation (AME)**
If the AME feature is enabled, when there is an incoming call, the call is automatically answered by the voice mail system and the caller's message is recorded in the mailbox. The voice mail system announcement and the caller's voice message are heard over the phone's speaker.
The Answering Machine Emulation (AME) feature allows a user to listen to a caller leaving a message in his/her voice mail box. It operates like a home answering machine. The AME Enable button is used to turn this feature On/Off.

- AME Auto Start
This method allows the incoming calls to be connected to AME by configuring the AME feature in advance.
If the AME auto start feature is enabled, when there is an incoming call and the call is not answered, the call forward no answer feature is used for forwarding the call to the voice mail system to automatically start the AME.
- AME Manual Start
This method allows the incoming calls to be connected to AME without configuring the AME feature in advance.
When the user's phone rings, the user can press the 'AME-Manual Start' button to process the call with call forward no answer and connect the call to the voice mail system.
The user can press the 'AME-Manual Stop' button on the phone while AME is in action, the caller will be connected to the user and AME will stop.
- Call Recording
This feature allows the call conversation to be recorded during a call.
When call recording begins, the 'Recording' message will be shown on the phone display, and the CANCEL, PAUSE, and STOP soft menus will be displayed for use.
 - Auto Call Record
If call recording feature is enabled, this service automatically records calls whenever they are started.
When a user for whom the auto call record feature is enabled is on a call, a three-way conference call will automatically be connected to the voice mail system and the call will be recorded.
When enabling the auto call record feature, you can specify a type of calls to record selectively.
 - Manual Call Record
This feature allows the call conversation to be recorded during a call by pressing the call record button.
If the user presses the 'Call Record' button + the mailbox number during a call, a three-way conference call will be established with the voice mail system and the call will be recorded in the selected mailbox. If a mailbox number is not entered, the call will be recorded in the user's mailbox.

Personal SPAM Number

IPX-S300B denies incoming calls which calling number is registered in SPAM list.

Pause Digit

In some cases, specific digits should be entered after making a call, It can be used for authentication. These digits can be assigned in speed dial menu after pause digits.
IPX-S300B makes a call and sends digits after pause delay time. Pause delay time depends on the number of pause digits ('p' or 'P')

This feature is served with the following services.

- Hot Line
- Speed Dial
- Call Forward
- Multi-Ring
- Paging on Answer
- Predefined Conference

Call Bridge

This feature allows the gateway FXS user to join the conversation of bridged user by hook-off. After that, if bridged user is hook-off, FXS user has a continued conversation. If bridged user is not busy status, the gateway FXS user listens dial-tone and makes a call.

Move to Mobile

The conversation can be continued through other phone. But there is no need to hold the call. It is the difference between Call Transfer and Call Moved to the other multi-device member, if a user selects the menu.

Manual Handover Service

If WE VoIP subscribers move out of WIFI network during a call, you can switch WIFI call to 3G call by manually before it goes out from the WIFI network.

Smart Handover Service

If WE VoIP subscribers move out of WIFI network during a call, WIFI call is switched to 3G call by automatically.

Smart handover is divided into two functions as follows.

- Smart Handover-Out: WIFI call is switched to 3G call automatically.
- Smart Handover-In: 3G call is switched to WIFI call automatically. However, it is served only if call is on Smart Handover-Out.

Simultaneous Ring Delay for Desktop Phone

When WE VoIP, 3G mobile phone, and desktop phone are set to ring simultaneously, the desktop phone can be set to start ringing later.

Ring Deflect

The Ring Deflect is a feature to transfer receiving calls to another number. Although the call forward always operates automatically under predetermined conditions, the Ring Deflect is useful when the user forwards calls selectively.

Ringling Preference

You can choose to answer a call or dial a number when the receiver is picked up or the speaker key is pressed while receiving calls by the Ringling Preference setting.

It is initially set to 'ENABLE', and answers receiving calls.

CHAPTER 6. Application Features

This part describes the applications provided by IPX-S300B and how to configure them. IPX-S300B includes a basic conference system and a basic ACD server. IPX-S300B Express also includes an advanced conference system and a voice mail system.

6.1 Application Server Service Group

Application server service groups must be created and assigned in order to support server interface for various applications for each user service.

In addition to using application servers, the servers must be grouped so that they can be assigned to different service groups or users. If application server service groups are not assigned, application server calls cannot work.

Servers that can be assigned to application server service groups must be available for user-specific services. The following server types are supported.

- Voice mail server
- Call Recording server
- Paging Conference server
- Meet-Me conference server
- One-step conference server
- Add-on conference server
- External ring back tone server

6.2 Automatic Call Distribution (ACD)

The Automatic Call Distribution (ACD) service is useful when there are more incoming calls than the people available to answer them. If the ACD feature is enabled, callers do not need to hear the busy tone for a long time or get delayed in getting their calls answered. When a call is connected while the ACD group is busy, the call is put in waiting status until an agent becomes available, and a waiting announcement is played for the caller so that the caller can wait until an agent answers the call.

Creating ACD Agents

Regardless of system extension number, an agent ID can be assigned. The agent can answer incoming calls for the ACD group from any phone by logging in using the agent's ID and password.

Configuring ACD Group

The method of distributing incoming calls for the ACD groups among agents and the method of playing standby announcement can be configured.

- **ACD Group Basic Information**
Basic information of the ACD group, such as the list of agents logging into the ACD group and the method of distributing incoming calls among agents, can be configured.
- **ACD Announcement (Greeting Message)**
When there is an incoming call for the ACD group, a short moment is allowed for the caller to hear the ring back tone, and then the announcement system of the IPX-S300B is connected to play the announcement. Subsequently, if there is an agent available, the call is connected to the agent. If not, the call remains in the ACD group and the announcement and the MOH are played alternately.
- **ACD Overflow**
When there is an incoming call for the ACD group, if there is an agent available, the call is connected to the agent. If not, the call remains in the ACD group and the announcement and the MOH are played alternately. If no agent becomes available even after a long time, the call can be transferred to another ACD group, etc.

ACD Agent Status

Since incoming calls for the ACD group are distributed according to the status of agents, it must be possible to retrieve the status of agents.

An agent can be in any of the following three status modes.

- **Logged in:** The agent is participating as a member to answer calls for the ACD group.
- **Wrap-up:** The agent is wrapping up after ending a call for the ACD group.
- **Break:** The agent is taking a break.

ACD Statistics

The IPX-S300B provides statistics on processing of incoming calls for the ACD group and ACD calls processed by each agent.

ACD Agent Program

While it is possible for ACD agents to process ACD calls by just using the phone, they can also process ACD calls more conveniently using a dedicated agent program.

Requiring a separate license, the dedicated ACD agent program has many useful features such as real time monitoring of pending calls for the ACD group.

6.3 Conference

IPX-S300B provides Conference service. It has the Internal Conference service which provides Add-on conference. VPU card can be installed to provide advanced conference services.

6.3.1 Conference Features

The Internal Conference service provides Add-On Conference only. Other services are provided by VPU card.

Add-On Conference

During a call (including a conference call), the call can be put on hold and a new call is made to another attendee. If the new attendee answers the call, the conference button can be pressed to include the new attendee in the conference.

Conference On Answer (COA)

Similar to the Add-On method, a call is made to an attendee and when the called party answers the call, the called party is automatically included in the conference.

Predefined Conference

The service allows a voice conference to be conducted with pre-assigned groups. The master of conference prepares the list of the group and members in advance by using the SCM Administrator. Also, the system calls each member using the list identifier for the conference then delivers the voices to each member after mixing the voice signals of each member into one voice signal.

Intercom Conference

Initiate a conference by dialing feature code + a hunt group number. The phones registered in the hunt group answer automatically to join the conference.

Dispatch Conference

This feature is provided for the CSTA applications to initiate a conference using its own conference group. It is not available from a phone.

Meet-Me Conference

The master prepares a conference room in advance, and then the members who participate in the conference input the conference ID to join. When each member tries to participate, the Conference server receives the conference ID and passcode through the voice guidance and DTMF before deciding whether to allow the entry to the conference.

Station Paging

When extension numbers are registered to a paging group number in advance, the entire paging group can be paged. The call is automatically answered by the phones paged so that the subscribers can listen to the moderator's announcement.

Paging On Answer

When the telephone numbers are registered to a paging on answer group number in advance, the entire group can be paged. When the called party answers, he can listen to the moderator's announcement.

Conference Member Eject

A member joined in a conference can be deleted by another member. The feature permission is allowed to conference owner or a user which setup the conference.

6.3.2 Conference Control

The conference control function provides a monitoring function for conference status by the master of the conference call, voice level control (mute of a participant's voice), and removing a participant from the conference room functions.

Conference Monitoring

The master can view the current conference status.

He/she can view the participating members, mute, or eject members, lock the conference, terminate the conference

Conference Group Management

A user can view, create, change or delete the pre-define conference groups.

Conference Room Lock/Unlock

The master may lock/unlock his/her own conference rooms. If a conference is locked, no more member can attend the conference.

Sole Participant Audio

This is the function that plays music (or a tone) if a participant is in the conference room by him/herself.

Adaptive Codec Negotiation

It is the function that actively negotiates the codec according to the system load.

IPX-S300B supported following audio CODECs: G.711a, G.711u, G.729.

6.4 VoiceMail/Auto Attendant (VM/AA)

VM/AA provided by IPX-S300B refers to the integrated messaging system interfacing with IP interface within IPX-S300B. In other words, it provides voice mail, automatic repeater, e-mail server interface, and other functions to users. The IPX-S300B provides voice mail service over 6 channels. The system supports up to 32 channels which can be added by adding VPU cards in the optional slots.

6.4.1 Voice Mail

The Voice Mail function is the service provided when the number called is unavailable. In this case, the caller may be connected directly to the voice mail or connection to the voice mail after ringing may be selected. The call is connected to voice mail according to various status (busy, no answer, and busy/no answer).

The system answers the call with the user's pre-recorded message and then the caller may leave a message.

The user can access the voice mail then listens to the messages received from anywhere. Various options are available for handling the messages.

Answering Machine Emulation (AME)

This function allows monitoring of calls made to the voice mail by using a phone speaker, and is similar to a home answering machine. (It is only provided by VPU card.)

Auto Conversation Recording

This function is used to record the phone conversation made between calling and receiving parties in the voice mail of the receiver. The recording starts automatically upon the beginning of the conversation and ends with the phone hanging up. Then the recording contents can be checked in the voice mail. (It is only provided by VPU card.)

Auto Forward

This function forwards the voice message automatically to the mail box of another phone if the message left in the voice mail is not played within a certain amount of time. The Delay time can be set by the user, and the forwarded message can either be kept or deleted. (It is only provided by VPU card.)

Auto Login

This function automatically logs into the voice mail without inputting the pin number and the authentication process. (It is only provided by VPU card.)

Auto Message Play

This function automatically plays new messages that arrive in the voice mail when the user is logging in, and it can minimize the unnecessary operation of selecting digits to input.

Broadcasting

This function sends a voice message to all users of the system at once that can be performed by the user with the manager's authority. (It is only provided by VPU card.)

Call Back

This function calls the sender who sent a voice message by pressing a button while listening to the message and can call both the extension and the office line. To call an office line, the Call ID should be available.

Call Forwarding to Voice Mail

This function forwards all incoming calls to the voice mail when the user's line is busy or cannot answer.

Call Record

This function records the contents of the phone conversation currently being made and saves it in the voice mail by pressing a button. (It is only provided by VPU card.)

Call Back Requested Message

A caller may select the Call Back Request option when leaving a message, and once the number to receive the call back has input, the user is notified that the call back has been requested when playing the message. At this time, the user can call the caller directly by pressing a button.

Date and Time Stamp

This function notifies the accurate message arrival time when the user has logged in the voice mail then playing a new message.

Quick Memo

This function allows a caller to leave a message more conveniently with other users.

Distribution Lists

This function leaves a voice message to multiple users simultaneously. The list can include not only the users' phone numbers but also the lists containing the users' phone number. When a message is left on a list, the message is saved in all phones of the users who are on that list.

External Number Notification

This function gives notification of a voice message to a pre-registered home phone number, cell phone, or other phone when it is received by the user's voice mail.
(It is only provided by VPU card.)

Message Scheduled Delivery

When a user leaves a message with another user, the function allows the delivery time of the message to be set.

Message Grouping

This function is used to listen to the voice messages received by a user's voice mail per type (emergency, Callback, Fax, Reply Requested, Memo, etc.) in groups.

Individualized Voice Mail Greeting

This function is for a user to record a greeting message for his/her voice mail. When a caller is accessing the voice mail to leave a message, the recorded voice mail greeting can be played.

Individualized Voice Mail Name

It is the function of linking each voice mail to the name that is recorded by the user's own voice.

Message Address Verification

This function is used to play back the numbers pressed by the user. This is so that he can make sure they are correct when he leaves a voice message.

Message Delivery Options

When a voice message is left in a user's voice mail, this function notifies it to a pre-registered home phone number, cell phone, or other phone only at the registered time.

Message Alert Notification Schedule

This is the function to set options for sending a voice message, and the options are Emergency Message, Callback Request, Reply Request, Secret Message, Receive Notification, etc.

(It is only provided by VPU card.)

Message Listening Option

The function is used for setting options for listening to the voice messages in voice mail, and functions such as replay, save, delete, rewind, fast forward, and pause can be used.

Message Forward With Append

When forwarding a voice message received by a user, this function allows additional information to be recorded onto the original voice message and sends it together.

Message Length Control Option

It is the function of setting the length of a voice message received by a user's voice mail.

Message Delivery Cancellation

This is the function that allows the cancellation of the voice message left in a voice mail by the caller if the message has not been played by the called person.

Message Reply

This is the function of immediately sending a voice mail to the caller by pressing a button while the user is listening to the voice message received.

Message Scan

This is the function of partially listening to the beginning parts of all messages in the voice mail of a user and scanning for a message.

Message Skip

This is the function of skipping the message that is saved in the voice mail to the next one instead of listening to the end of the message.

Message Undelete

This is the function used to either listen or save a message in a voice mail after a user has listened and deleted the message.

Message Waiting Light Indication

When a voice message has arrived in the voice mail, the function notifies it to the user by blinking the phone lamp.

Multiple User Mailboxes Login

It is the function of several users accessing one mail box simultaneously then listening to a message. However, one message cannot be listened to by several users at the same time, and the message being played for a user becomes unavailable for other users.

Multiple User Mailboxes

Generally, the same number is used for both Mailbox and Extension, but different numbers can be used also for the each or using a Mailbox without an Extension is also possible.

One Touch Access

This is the function of logging in by using just one button or logging in with the Admin authority.

Reminder

This function is for the user to leave a self memo such as a schedule or other items that need to be recorded.

6.4.2 Auto Attendant

Auto Attendant (AA) function is the function whereby VM/AA answers a caller automatically and plays a voice guidance message or messages according to the caller's dialing command. The caller may appoint a person or group by pressing the number. AA answers the caller with a pre-recorded prompt and also plays several options that the caller may choose (selecting the number to transfer, connecting to the voice mail or Auto Attendant, accessing the pre-recorded information, etc.).

Multiple Alphabetic Directory

When a user does not know the phone number of the person to call, the function allows the system to search the phone number just with partial letters of the name then either connects to the person or to the voice mail.

Also, the system directory service is available to use by pressing '9' on AA after calling on the office line. When the name of the called person is input through the key pad, the call is connected to the person when the search result is one person or plays the names that are searched if two or more names are resulted where the caller can choose one name.

Auto Attendant Route

Automatic repeater is the function to either route or transfer a call according to the number the caller is pressing. By using the function, a call can be either transferred to a specific user or connected to a voice mail in VM/AA and also can interworking with functions such as Fax sending/receiving or E-mail receiving.

Direct to Mailbox

This is the function of providing only the mailbox without a linked phone number (Station). This function is ideal in situations where there are few workers working in the office while many are working outside of the office.

Holiday and Special Events

This is the function for playing a special prompt to callers who made calls on holidays or certain company holidays.

Interruptible Voice Prompts

This is the function to select a desired service while a prompt is being played instead of listening to the end of the voice guidance or prompt.

Multi Call Handling

This function handles multiple calls simultaneously.

Multi Language Support

Supports multiple languages.

Operator Access

A caller may connect to an operator who is in ready state by pressing '0' at any time.

Single Digit Call Routing

The menu processor can be set to perform a routing in a specific routine by recognizing one number. For instance, it can be set to connect to the number 2001 of Sales Department when the number '1' is pressed on menu.)

6.4.3 Access Manager

Access Manager Function can individually manage the callers connecting the users.

The mail box owner can set his/her extension number to not ringing, connect a call to other extension number within the phone system, or search the call before answering.

These conditions can be set for specific times. VM/AA can be set to 'Find Me' to allow connection to the users in different places.

(It is only provided by VPU card.)

Call Blocking

While Call Blocking is set by a user, VM/AA does not connect callers to the user's extension. Instead, the call blocking greeting prompt is played immediately to the caller. If the call blocking prompt has not been recorded, VM/AA plays the user's existing no answer prompt. If the no answer prompt has not been recorded either, VM/AA plays the guidance prompt to the caller saying that the called number is currently not available and suggest other options.

The user sets call blocking using the access manager service. After setting call blocking, the user can set the blocking period. This function can be set to be activated for certain time periods such as until the end of today's business hours, until the start of the next business hours, until one day of the next week, from Monday to Sunday, until a certain date, until a specified time, or for certain hours; from 1 hour to 9 hours.

Call Forwarding

Callers are connected to an internal extension number. (cannot connect to an office line.)
When the call is being connected to an extension, the prompt of ‘You are being connected to A of B department. Calls are connected to C.’ is played to the caller. Then when the called person answers the call, he will hear an automated announcement giving the information of the caller.

This function can be activated for between 1 and 9 hours, until the end of current business hours, until the beginning of the next business hours, until one day in the next week, from Monday to Sunday, or until a certain date.

Day/Night Personal Greeting

The Night Personal Greeting works in conjunction with the user’s Weekly Availability Schedule. During the defined availability period, the VM/AA will automatically play the Primary No-Answer Greeting to callers, unless the user is busy on another call and has recorded a Busy Greeting or Call Blocking is set active, and a Call Blocking Greeting is recorded. During the time periods a user is not scheduled available to take calls, and does not have Call Blocking activated, the VM/AA plays the user’s Night Greeting if recorded.

Find me

When this function is activated, the VM/AA attempts to deliver a call to a place designated by the user. The VM/AA first finds the user in the location designated by the user then makes the call to each of the user’s saved phone numbers if necessary until all numbers are called. This function can be activated for between 1 and 9 hours, until the end of current business hours, until the beginning of the next business hours, until one day next week, from Monday to Sunday, or until a certain date.

Follow Me

A user can pick up a call that is automatically forwarded to a designated location. This is called the user’s location designation. The location designation can be set for both internal extension and external phone number. This function can be activated for several hours from 1 to 9 hours, until the end of current business hours, until the beginning of the next business hour, until the day of the next week, from Monday to Sunday, or until a certain date.

Hold for Busy Station

VM/AA allows the caller to be placed on hold during a call. When a caller makes this choice, VM/AA puts the caller on hold. If another caller reaches the busy extension, the caller is put on hold with an on-hold notification and the expected waiting time until connection. Meanwhile, the called person is informed of a new incoming call.

Multiple Personal Greeting

When a user cannot receive a call, the VM/AA answers the call. VM/AA categorizes the user's reasons (5 categories) for being unable to pick up the call, and different greeting messages can be used for each reason. VM/AA provides several (1 to 9) greeting recording functions to users, and a user can use different greetings according to the situations.

Park and Overhead Paging

The VM/AA provides park and paging function for users who are frequently out of office. When a user is not answering a call and caller selects 'Park & Page,' the VM/AA notifies the user by turning on the speaker phones that are registered by the user.

Telephone Number Storing

This function is used to save the phone numbers that are frequently used by a user.

Weekly Schedule of Call Availability

This function registers a time of a day when the user can generally receive calls, and VM/AA plays a proper guidance message if the user cannot receive calls during that time.

6.4.4 E-mail Server Interface

An integrated messaging system can be configured by interfacing voice message through the E-mail server interface function.

Especially through the MS Outlook interface function, considerations have been given to existing E-mail users to use VM/AA more conveniently by allowing existing Outlook users for the service. Also, the integrated messaging system can be configured by interfacing with external servers (example: Exchange Server).

(It is only provided by VPU card.)

Outlook Interface

Users of VM/AA can send/receive all voice messages to/from the voice mail by using the Outlook.

Interface with E-mail Server

By interfacing (IMAP) with E-mail server, VM/AA can integrate and manage voice messages

6.5 Call Recording

Since IPX-S300B V2.0, new recording feature is supported. Unlike recording supported in the previous VM, it consolidates and manages recorded files, and it is easy to listen, download, and backup recorded files.

To use this feature, a VPU card must be installed.

6.5.1 Recording Specifications

VPU Number

Two VPU's can be installed: one for VM/Conf and one for Recording. Two VPU's cannot be installed for a single purpose.

Recording Channel Number

A maximum of 10 for conference recording and a maximum of 20 for telephone recording are supported. When both are used, the available number decreases in the ratio of one conference recording to two telephone recording. In addition, this can be limited by the license entered.

Recording Time

A maximum of 500 hours of recording files can be saved to the VPU. However, it can continue to record, overwriting old files or deleting old files after backup. The maximum recording time per call is limited to 24 hours.

Recording File List

The recording file list can store up to 100,000 and oldest ones will be deleted after exceeding 100,000.

Recording File Type

Recorded files are saved to the VPU as G.711 8000 Hz Mono 64 kbps, and also transmitted to the backup device in this format. However, when playing and downloading in the SCM Administrator, it is downloaded after converted to WAV.

6.6 External Applications

6.6.1 Samsung Communicator

The Samsung Communicator is Unified Communications Client software running on a client PC that takes the functionality commonly used and understood on our telephones and puts it at your finger tips and Screens on your PC. The Samsung Communicator can be run in three different Modes. The Samsung Communicator can be a stand alone device when in the Soft Phone Mode, when in UC Phone Mode it can work in connection to a UC phone (SMT-i Series) device. Also, when in Desk phone Mode it can work in connection to a UC phone (SMT-iSeries) and other 3rd party SIP Phone via CTI I/F of IPX-S300B. All of which empowering the user, when connected, to make/receive calls to/from anywhere in the world as authorized by the organization.

The Samsung Communicator is an integrated client communications application that brings together two devices; your business PC and your business telephone. This enables users/users on the same phone system to communicate via Voice and Video.

Soft Phone Mode (PC Phone Integration Device)

The Soft Phone Mode is also known as a PC Phone device. In this mode, the Communicator Soft Phone is the device the user uses to make/receive all their calls. The Communicator Soft Phone is a software device that emulates a Samsung business telephone. The Communicator Soft Phone is registered to the Samsung switch installed at the Corporate office empowering the user, when connected, to make/receive calls to/from anywhere in the world as authorized by the organization, all through their PC and PC's Multi-Media functionality (PC MUST be equipped with Internal or external Mic and Speakers and/or headset).

UC Phone Mode (Samsung SMT-i Series Device Integration Only)

In this mode, the Samsung Communicator interoperates directly with a telephone device such as the SMT-i5343 terminal. In this mode, telephone functionality can be performed from either the PC or telephone device. However unlike the Communicator Soft Phone Mode while in UC Phone Mode you MUST use the SMT-i Series device to talk with the caller.

Desk phone Mode (Samsung SMT-i Series and other SIP Phones Integration)

In this mode, the Samsung Communicator controls the call of your phone in interoperation with the PBX via CSTA I/F

- Answering/Making Calls
- Call Control: (Transfer, Hold, Forwarding, Speed Dial, etc...)
- Call/Missed Call Logs
- Dial from Outlook Contact List(s)
- Free Dial

- Missed Call Notification
- Phonebook
- Schedule
- Screen Pop Contact List (both from Communicator Phonebook and Outlook)
- SMS/Text Messages
- Video Calls
- And more...

For more details, see the Samsung Communicator User Guide.

6.6.2 ACD Agent

ACD Agent Desktop is the Windows-based Client Application that resides on the agent's computer. With Agent ACD, you can control calls with your computer.

The ACD Agent allows you to:

Call Control

- Make Calls
- Answer Calls
- Transfer Calls
- Conference Calls

Monitoring

Provides the real time status information of the ACD Group where the Agent belongs.

- Number of wait calls: Currently waiting for the call distribution.
- Number of Logged-in Agents
- Longest ACD wait time (current): Waiting time of the call that has waited for the longest time among the calls currently waiting
- Number of IDLE Agents: Agents that the call distribution service has available.

6.6.3 Third Party Applications

IPX-S300B can interface with external SIP Conference Server, SIP VMS, SIP UMS, SIP IVR (AA Server), and Legacy (PSTN) VMS, and can be categorized as shown below according to the interface type.

Using Standard SIP

IPX-S300B provides the interface function by using standard SIP protocols with application servers such as SIP Conference Server, SIP VMS Server, SIP UMS Server, and SIP IVR.

Using Standard CSTA

IPX-S300B provides the interface function using standard CSTA Phase-II protocol. For more details, see the IPX-S300B CSTA Interoperability Guide.

6.7 Solution Partner Applications

Ring Back Tone Server

The ring back tone server provides the ring back tone service. When the ring back tone server is connected, the caller can hear the ring back tone while the call is being connected.

Voice Mail System (VMS) Server

Working together with the voice mail call processing system, this application provides services for transferring calls to the user's number with voice announcement (auto attendant), taking voice mail when the user is unavailable, etc.

Transcription Server

Currently, only IP packet mirroring type transcription servers can be connected. Using an IP packet mirroring type transcription server requires configuring the IP network equipment. No additional configuration is needed on the IPX-S300B.

Standard SIP Method

The IPX-S300B uses the standard SIP protocol to provide interfacing with application servers such as SIP conference server, SIP VMS server, SIP IVR, and SIP UMS server.

Standard CSTA Method

The IPX-S300B uses the standard CSTA Phase-II protocols to provide interfacing with any external application servers such as ACD server and IP relay server. For more details, see the IPX-S300B CSTA Interoperability Guide

CHAPTER 7. Network Feature

7.1 Network Feature

WAN Interface

The gateway supports two GbE interfaces, each of which can be connected to WAN and LAN.

LAN Redundancy

When connecting LAN only to the two GbE interfaces of the gateway, the LAN connection can be configured in redundancy.

NAT

When both WAN and LAN are connected to the gateway, the external network and the internal network are isolated as separate networks, with the NAT function automatically converting addresses and exchanging packets between the two.

Port Forwarding

By specifying external network ports on the gateway, packets can be forwarded according to internal addresses, ports and protocols.

QoS

When VoIP packets and data packets are present at the same time, VoIP packets can be served on priority.

DHCP Server

The DHCP server of the gateway can automatically assign IP addresses to the internal boards and other devices connected on the LAN interface.

CHAPTER 8. SBC Function

8.1 SBC Function

Signaling and Media Control

SIP signaling and media can be transferred between the inside and the outside.
UDP, TCP, and TLS transport are all supported, with support for conversion transfer.
SIP signaling and media can be transferred for SIP entities under NAT of the external network.

Call Routing

Routing adjustment can be done based on the source address in the SIP signaling message.
Subscriber call routing can be done according to the registration message.

Security

SIP signaling from unauthorized IP addresses can be rejected.
Topology for SIP messages can be hidden.

Redundancy

In the case of SIP entity validation (using ping or options messages) or problems, alternative routes can be used.

QoS Marking

QoS settings can be enabled.

CHAPTER 9. System Operation

This section describes the features required for system management.

9.1 Access Control Management

SCM Administrator can control access for operators (Engineering, Technician and Customer-3 Levels supported).

Administrator can manage operators' IDs, passwords, levels, classes, login timeout password duration, forced password change, etc.

Administrator can use control access by entering user terminal information.

9.2 Process Management

Multiple processes (programs) run organically on the IPX-S300B.

Naturally, the IPX-S300B features a process manager which manages such processes by performing the following functions.

- Starting and stopping the IPX-S300B
- Process management
- Starting and stopping individual processes by operator command
- Retrieving process version information

Starting and Stopping IPX-S300B

- IPX-S300B automatic start
When you configure the database and IP settings after installing the IPX-S300B, the system restarts and the IPX-S300B starts automatically. Also, when you power on the IPX-S300B server, the IPX-S300B starts automatically.
- IPX-S300B manual start and stop
To manually start or stop the IPX-S300B, you should connect the console port of the IPX-S300B and execute the reboot command.
Or you can reboot system in SCM Administrator.

Process Management

- Process monitoring
The IPX-S300B process manager monitors the status of all processes at all times. When a process is down, the process manager automatically restarts the process. If the restarted process continues to terminate abnormally, the process manager does not restart the process any more. This is because the process manager thinks that the process would terminate abnormally again when restarted.
- Process status
Each process of the IPX-S300B can be in any of the following status: NORMAL, ALIVE, WAIT or FAIL.
- Process level (priority)
The IPX-S300B categorizes its processes into Critical, Major, and Normal levels depending on the impact on the system and applies different management policies accordingly.
- Starting and stopping individual processes
The IPX-S300B operator can stop a running process or start a stopped process. Processes can be stopped or started using the [**Performance > System Management > Process Management**] menu.
 - Click the Activate button, select a stopped process, and click the Activate button again to start the process.
 - Click the Deactivate button, select a running process, and click the Deactivate button again to stop the process.
- Retrieving process version information
Each process of the IPX-S300B has information for its version, creation date and creation time.

9.3 Operation Management

9.3.1 System Configuration

To view or change the system configuration, log into SCM Administrator and click the [CONFIGURATION] icon on the main menu.

The Configuration menu contains various sub-level menu items including Location, User Group, User, Trunk Routing, Time Schedule, Service, Application, Phone Setting, Announcement, Miscellaneous and gateway.

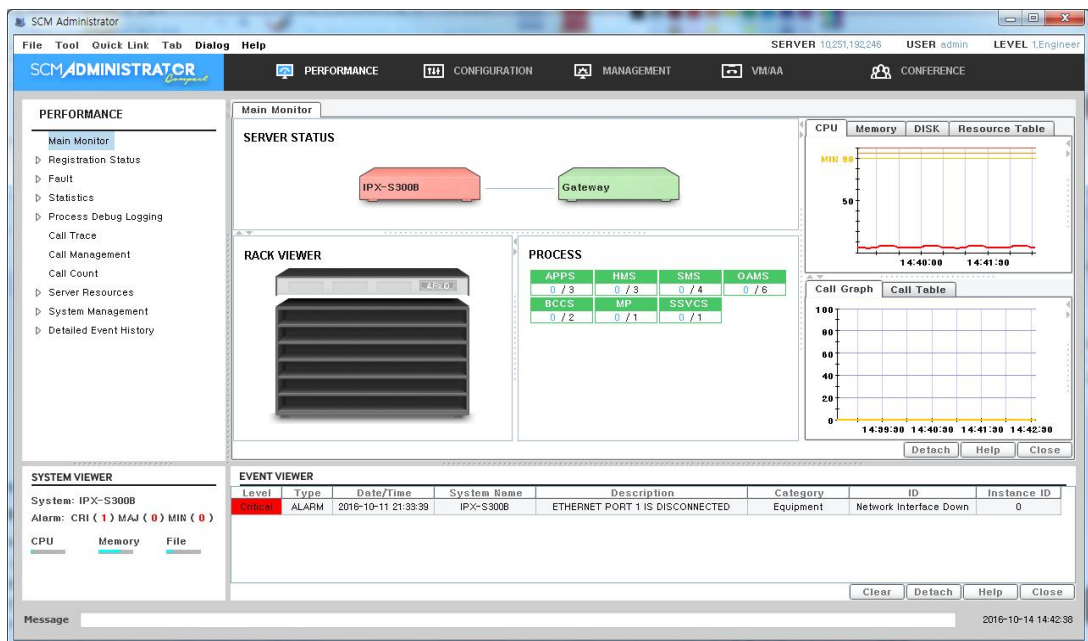


Figure 18. SCM Administrator

9.3.2 System Performance Management

To check the current IPX-S300B system performance status including CPU, memory, and disk utilization, watches the right side of the main monitor. Also, it can check the system and process resource usage activity.

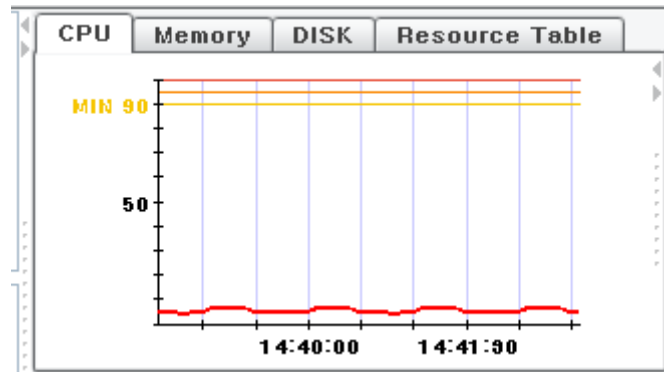


Figure 19. IPX-S300B Performance Monitor

System Resource Monitoring

IPX-S300B monitors the system resources in five second intervals and displays the information in IPX-S300B Administrator. Also, when a specific resource's usage increases, alarms are generated in the order of Minor Major Critical to notify the administrator of any system problems.

The system resources monitored by IPX-S300B include CPU, memory and hard disk drives.

Viewing System Resource Information

The Chart of Right Side display CPU, memory, and hard disk. Also, CPU, memory and hard disk usage in the System Viewer screen in the bottom left corner.

If a network card stops working, it generates an alarm, which is cleared when the problem is rectified.

Viewing Resources by Processes

When a specific process's CPU usage increases, alarms are generated in the order of Minor Major Critical to notify the administrator of any system problems.

9.3.3 Announcement Management

IPX-S300B's built-in sound source system can play voice announcements and system tones when necessary.

Release Announcements

This service plays voice announcements when calls are not processed normally due to errors, etc.

Select an announcement and click the Play button to have the selected announcement play through the PC's sound device.

Service Announcements

Voice announcements can be played when using call processing services.

Select an announcement and click the Play button to have the selected announcement play through the PC's sound device.

Music On Hold (MOH)

This Service manages the system tones for the music and tones played when calls are put on hold or forwarded. You can also register different sound sources required for the site and service them.

Select a MOH and click the Play button to have the selected MOH play through the PC's sound device.

Language Settings

IPX-S300B supports announcements in multiple languages. However, due to the complexity of settings to configure different conditions for different languages, only one language is serviced at a time.

9.3.4 Call Management

IPX-S300B provides a feature for viewing the information of currently processed calls. It also allows the administrator to terminate currently processed calls by different criteria such as unusually long calls or illegitimate calls. IPX-S300B also provides the trace feature which allows the administrator to trace calls or protocol messages.

Call Management

You can view the currently processed calls. Click the Search button to view the list of currently processed calls.

You can filter the call list displayed by entering advanced conditions such as caller numbers, called party numbers and call durations.

Select a call from the list and click the Delete button to terminate the selected call.

Signaling Trace

IPX-S300B supports a protocol tracing feature (SIP signaling trace) for calls.

Create a protocol trace item in the [**PERFORMANCE > Call Trace**] menu to view protocol messages by call stages in Job Monitor.

Following three types of protocol tracing is supported based on the call type.

- Call Trace: All protocol messages from the call initialization stage to the call termination stage are traced for a call for a user's extension number.
- Route Trace: All protocol messages from the call initialization stage to the call termination stage are traced for a call for a route.
- Protocol Trace: All protocol messages sent to and received from a specific IP address are traced.

9.3.5 Database Management

IPX-S300B provides a feature for backing up the database during operation.

When upgrading IPX-S300B to a newer version, you can back up the database, upgrade the version, and then restore the database for use.

Database Space

IPX-S300B provides a feature for displaying the current size of the database.

The maximum allowed database size is shown in KB.

Database Backup

You can configure periodical database backup to backup the database periodically or perform an immediate database backup.

9.3.6 User Management

IPX-S300B provides a feature for managing IPX-S300B users including phones, routes, gateways, and applications.

Extension Management

IPX-S300B manages extension users by adding, deleting or changing extension users in the database. Extension user information can be either phone information with physical properties or user information with logical properties.

Trunk Management

IPX-S300B manages trunk users by adding, deleting or changing trunk users in the database. Trunk user information can be either endpoint information with physical properties or route information with logical properties.

Registration Management

IPX-S300B manages the registration status of the users-including phones, routes, gateways, and applications-which provide services by performing SIP registration with IPX-S300B and displays their current status.

Authentication Management

IPX-S300B can authenticate registration of the users-including phones, routes, gateways, and applications-which provide services by performing SIP registration with IPX-S300B. Also, when an extension user makes a call, IPX-S300B provides a service for allowing the call to be made after obtaining an external server's authentication.

Service Allowance Management

IPX-S300B can allow each individual extension user to use different sets of features by assigning them to service classes.

9.3.7 Maximum Calls Management

On an IP-based PBX, it is not possible to limit the number of phones physically connected or the number of calls made simultaneously. However, since system resources are limited, a service is required to limit the maximum number of calls at any one time.

IPX-S300B provides the Call Admission Control (CAC) feature which limits the maximum number of calls allowed. The CAC service provided by IPX-S300B includes CAC by call counts, CAC by location based bandwidth, and CAC by system resources.

9.4 Call Detail Records (CDR) Management

Account information includes Call Detail Records (CDR). Whenever a call starts or ends, IPX-S300B records the call information according to the account data recording method defined for each user group. Account data can be recorded by Local, FTP or TCP. Names of the files saved and their directory names are determined by the recording method used.

Local Store (Saving Account Information in IPX-S300B)

The CDR files generated are backed up and saved in the IPX-S300B hard disk without interoperating with any external account systems.

FTP Send (FTP Interoperation for Accounting System)

The CDR files generated are transferred to the external accounting system interoperating by FTP protocol.

TCP Send (TCP Interoperation for Accounting System)

IPX-S300B interoperates with the external accounting system over a native TCP method. Whenever CDR data is generated, the CDR data is transferred to the TCP server. CDR files are also backed up in IPX-S300B.

Billing Output by Call Types

This is a function that the CDR data is created by call types

Billing Delete Length

This is a function that deletes access code of trunk in the 'connect number' of CDR

9.5 Traffic Reports

The IPX-S300B provides hourly, daily, and monthly statistics for calls and alarms in the system.

Maximum periods for hourly statistics, daily statistics, and monthly statistics are 7 days, 90 days, and 365 days respectively. Also, hourly statistics and daily statistics can only be retrieved for the last 30 days and 365 days respectively.

Call Traffic Reports

IPX-S300B provides statistical information for calls generated in the system by hours, dates and months.

- System Statistics
 - Internal Calls: Calls were attempted between internal users.
 - Outbound Calls: Calls internal users attempted to call external users.
 - Inbound Calls: Calls external users attempted to call internal users.
 - Tandem Calls: Calls external users attempted to call other external users through IPX-S300B.
 - Call Failures: All failed calls including unknown calls.
 - All Calls: This shows the statistical information for all calls.
 - Failure Reasons Calls: All failure reasons.
- User Group Statistics
 - Outgoing: Counts users of user group attempted to make outgoing calls.
 - Incoming: Counts attempted for users of the user group
- Service Group Statistics
 - Outgoing: Counts users of service group attempted to make outgoing calls.
 - Incoming: Counts incoming calls were attempted for users of the service Group
- Route Statistics
 - Inbound: Counts incoming calls were attempted for internal users through the route.
 - Outbound: Counts internal users attempted to call external users through the route.
- Hunt Group Statistics
 - Incoming: Counts incoming calls were attempted for users of the hunt group.
- User Statistics
 - Outgoing: Counts the user attempted to make outgoing calls.
 - Incoming: Counts incoming calls were attempted for the user.
- System Service Statistics
 - Mobile Remote Dial: Counts the system attempted the make mobile remote dial.
 - Smart Routing: Counts the system attempted the make all smart routing.
 - Smart Routing (Internal): Counts the system attempted the make internal smart routing.
 - Smart Routing (External): Counts the system attempted the make inter IPX-S300B smart routing.
 - Smart Handover: Counts the system attempted the make smart handover.
 - Mobile Call: Counts Samsung mobile phone attempted the make calls.

- Phone Usage by Type Statistics
 - Internal Outgoing Usage: Counts outgoing calls were attempted between internal users
 - Internal Incoming Usage: Counts incoming calls were attempted between internal users
 - Outbound Usage: Counts internal users attempted to call external users.
 - Inbound Usage: Counts incoming calls were attempted for internal users.
 - Total Usage: This shows the statistical information for all calls.
- Phone Registration by Type Statistics
 - To Reg: Counts state change from unregistration to registration
 - To Unreg: Counts state change from registration to unregistration
 - Registration Average: Averages state is registration.
- ACD Group Statistics
 - System Summary: All system-wide ACD calls.
 - Group Summary: All calls for the ACD group.
 - Overflow: Overflow occurred for ACD group.
- ACD Agent Statistics
 - Summary: all agents' calls.
 - Utilization: all agents' level of contribution.
 - Activity: all agents' activities.

Resources

- CPU statistics
Shows statistics for system CPU.
- Memory statistics
Shows statistics for system memory.

System Alarm Statistics

Shows statistics for system alarms, failures and status.

Emergency Call History Statistics

Shows statistics on emergency call history.

9.6 Fault Management

This section describes various settings and methods for handling system events. Events are generated as alarms, faults or status whenever there is a problem with the system or a specific status changes. You can configure the profile for such events.

Alarms, faults and status serviced by IPX-S300B are categorized in the following way:

- Alarm: A critical problem such as network failure or process termination has occurred and it can be cleared.
- Fault: A critical problem such as database backup failure has occurred and it cannot be cleared.
- Status: A status change, such as redundancy status change, which is not an alarm or a fault has occurred.

In the bottom left corner of the IPX-S300B Administrator screen is the System Viewer window which displays the number of alarms generated in the IPX-S300B system. When an alarm is generated in IPX-S300B, the System Viewer window displays the number of alarms generated for each level.

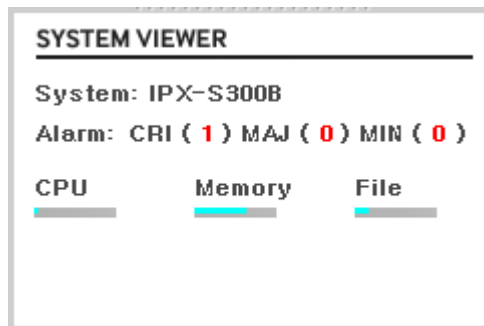


Figure 20. System Viewer

Setting

A setting contains detailed information for alarms, faults and status generated in IPX-S300B.

The administrator can use this information to configure how IPX-S300B Administrator displays the alarm, fault and status information.

Viewers

Event Viewer provides real-time monitoring of alarms, faults, status, and alarm clear information in the IPX-S300B system.

Viewer-Event displays alarm, fault, status, and alarm clear information simultaneously in the order of alarms > faults > status > alarm clear from the top.

Viewer-Alarm provides real-time monitoring of alarms generated and then cleared in the IPX-S300B system.

Alarms are highlighted in different colors depending on the levels: red for critical, orange for major, yellow for minor, and green for normal. When an alarm is cleared, it is highlighted in green for normal level.

History

This feature allows you to manage the history of alarm, faults and status information generated in IPX-S300B.

Email Notification

The alarm, fault, and status information generated in IPX-S300B can be notified to the administrator by email. To allow this, the email field in the alarm profile, fault profile or status profile must be set to Enable and the required settings for the email server must be configured in email settings.

SMS Notification

The alarm, fault, and status information generated in IPX-S300B can be notified to the administrator by SMS. To allow this, the SMS field in the setting-alarm, setting fault or setting status must be set to Enable and the required settings for the SMS server must be configured in email settings.

9.7 License Management

9.7.1 Trial Version License Key

The IPX-S300B provides a trial version license for trying out phone user count settings, scheduled conference and VM function, ACD function, CSTA interface function, etc. The trial version license can be used for up to one month from system installation.

User License

The user license management screen is provided where the manager can input the license key that is based on the server equipment information where IPX-S300B is installed and also check the result.

Embedded Application License

The embedded application License management screen is provided where the manager can input the license key required for starting Voice Mail of Meet-me Conference that is based on the equipment information of the server where IPX-S300B is installed and also check the result.

External Application License

The external application license management screen is provided for external servers where the manager can input the license key for starting external application that is based on the external server's equipment information and also check the result.

9.7.2 Activation Key

IPX-S300B supports management of activation key for call handling, UMS/MCS users and the ACD to be installed in other server.

IPX-S300B Package

The activation key management screen is provided where the manager can input the activation key that is based on the server equipment information where IPX-S300B is installed and also check the result.

9.8 Photo File Management

The purpose of the photo file management is to check photo files which are used in IPX-S300B and to provide tools such as Compress, Delete and Adjust. Also, Upload and download of batch file can be provide through this menu.

The functions are as follow.

- Search: show the count and the size of photo files which is stored in IPX-S300B
- Command: provide Compress/Delete/Adjust processing.
- Upload: can change several photo files with a batch file formatted in TAR.
- Download: can get the stored photo files in IPX-S300B

9.9 Installation Features

This section describes the procedures for using the essential management tools (including the tools for installing phones, installing gateways, and batch importing or exporting large-volume information) for operating the IPX-S300B system.

9.9.1 Data File Export/Import

IPX-S300B Administrator's data file export/import feature allows exporting information from some of the IPX-S300B Administrator menu items into an Excel spreadsheet, which can then be edited offline and be imported back.

When editing the Excel spreadsheet offline, you can edit the information for each field and also add or delete lists. IPX-S300B can be updated with any changes made in the Excel spreadsheet.

9.9.2 Phone Settings

PNP Installation

This feature allows a phone to be registered with IPX-S300B when powered on so that it becomes available for service. If a MAC address is registered when creating the device, `sec_{mac address}.xml` is created in `/tftpboot/sec_mac/`. If a phone uses PNP, the phone reads this file to acquire the required information and automatically requests IPX-S300B for registration.

If PNP is not used, you can register the phone by manually entering the profile ID, password and the IP address of the IPX-S300B on the phone.

If PNP is used, it means that an IP address is automatically allocated to the phone by the DHCP server and the phone is automatically informed of the IP address of the profile server. Therefore, the IP address of the profile server must be included in Option 43 of the DHCP server. You may configure IPX-S300B to as a profile server without installing a separate profile server, but this is not recommended for IPX-S300B Enterprise.

Phone Profile Information

A service profile is applied to all phones in a user group. It includes definitions of available services. It includes information on feature codes, etc.

A line profile is applied to each phone number. It includes definitions of features available for each number. It includes information on call forward settings, etc.

Phone Update

This service allows the administrator to update profiles. Service profiles, user profiles, and line profiles can be updated.

If necessary, phones can be upgraded. Multiple phones can be set for upgrades at a specified time.

Manual Phone Update

Phones can be updated manually in the following ways:

Profile Update

This method sends an SIP Notify message which notifies profile changing to a phone.

Although this message is sent automatically when changing profile, you can have force it to be sent when necessary.

The following profile types are possible.

- Service Profile
- Line Profile
- User Profile
- Phone Profile

Model Update

This method is used for upgrading the phone software.

‘Model Update User Group’ method updates all phones of a specified model in a user group. When this method is used, phones of the selected model are updated starting from the start device, a specified number of phones at a time and at a specified time interval.

Reboot

This method is used simply for restarting the phone.

‘Reboot User Group’ method restarts all the phones in a user group at once. This method processes 40 phones each second. If you use this method to update phones, the system may slow down due to overload. Always use the model update user group feature when updating phones

User Profile

You can configure the phone version, the secondary NTP server and the refresh time.

When using NAT, you can configure the secondary NTP used on the public IP network.

When the settings are changed, sec_boot.xml and sec_user_XXX.xml are changed, and a Notify message is sent to all phones.

Dial Plan

When dialing a phone number on the phone, if the number entered matches a specified rule, the phone can be set to send a sent message immediately to IPX-S300B without waiting for the next number or timeout. IPX-S300B can set dial plans to be used by phones and send them to all phones.

Automatic Phone Update

IPX-S300B can automatically upgrade the phone software.

Load the package on a selected profile server and reboot the phone to have the phone upgraded automatically.

During automatic upgrade (if the version information in sec_boot.xml is different from the version on the phone), the phone software is automatically updated according to the <upgrade_server> IP address and the protocol (tftp or http) defined in sec_boot.xml.

When the update is complete, sec_boot.xml is loaded again for the rest of the procedure.

In a large-scale IPX-S300B system, a separate profile server should be installed to reduce load and upgrade time. (including sec_boot.xml)

The TFTP server and the upgrade server are included in IPX-S300B by default.

If necessary, you can have separate servers for these functions

9.9.3 Gateway Settings

IPX-S300B provides the survivable telephony support service, whereby, when an IP phone is disconnected from IPX-S300B, the phone is connected to the gateway for minimum PBX features. The survival feature really works by the gateway and the IP phone and not by IPX-S300B. Generally, it is usually used not when there is a problem with IPX-S300B but when the IP network between the IP phone and IPX-S300B experiences a trouble, especially when the phone and IPX-S300B are in different locations.



ANNEX A. Supported Specifications and RFC

A.1 SIP

RFC on SIP protocol and related RFCs being supported in IPX-S300B is as follows.

RFC	Description
RFC2246	The TLS Protocol Version 1.0
RFC2327	Session Description Protocol
RFC2833	RTP Payload for DTMF Digits, Telephony Tones and Telephony
RFC2976	The SIP INFO Method
RFC3261	Session Initiation Protocol
RFC3262	Reliability of Provisional Responses in SIP
RFC3263	SIP: Locating SIP Servers
RFC3264	An Offer/Answer Model with SDP
RFC3265	SIP-Specific Event Notification
RFC3311	The SIP UPDATE Method
RFC3323	A Privacy Mechanism for the SIP
RFC3325	Private Extensions to the SIP for Asserted Identity within Trusted Networks
RFC3326	The Reason Header Field for the SIP
RFC3428	SIP Extension for Instant Messaging
RFC3515	The SIP Refer Method
RFC3581	An Extension to the SIP for Symmetric Response Routing
RFC3665	SIP Basic Call Flow Examples
RFC3711	The Secure Real-time Transport Protocol (SRTP)
RFC3725	Best Current Practices for 3PCC in the SIP
RFC3824	Using E.164 numbers with the SIP
RFC3842	A Message Summary and Message Waiting Indication Event Package for the Session Initiation Protocol (SIP)
RFC3891	The SIP Replaces Header

RFC	Description
RFC3960	Early Media and Ringing Tone Generation in the Session Initiation Protocol (SIP)
RFC4028	Session Timers in SIP
RFC4492	Elliptic Curve Cryptography (ECC) Cipher Suites for Transport Layer Security (TLS)
RFC5246	The Transport Layer Security (TLS) Protocol Version 1.2
RFC5359	Session Initiation Protocol Service Examples

A.2 SNMP

Standards related to the SNMP protocol being supported in IPX-S300B are as follows.

SNMP v1, v2

ANNEX B. CDR

Call Log Format

No.	Parameter	Description
Header		
1	Sequence Number	00000000-99999999 The sequence number when recording in Call log File. This increases by 1 when CDR is generated. Reset when new log file is generated.
2	DP Type	CDR creating point (Sending/Receiving)
3	Call ID	Call Identifier
Number		
4	Calling Number	Calling Only
5	Current Calling Number	The last number used to be connected to sending
6	Calling Name	The last name used to be connected to sending
7	Dialed Number	The number input by user or received from incoming (number before the number conversion)
8	Connect Number	The last number used to be connected to receiving
9	Connect Name	The last name used to be connected to sending
10	Billed Number	Bill Number (User's accounting code)
Usage (Time)		
11	Attempt Time	Time when the call is attempted
12	Call Duration	Call Duration Time (Disconnect Time-Answer Time)
13	Answer Time	Time when the call is connected
14	Disconnect Time	Call End Time
Call Forwarding Information		
15	Call Forwarding Flag	Call Forwarding status - 0: Call Forwarding not used - 1: Call Forwarding used
16	Call Forwarding Count	Number of Call Forwarding Attempts
17	Original Called Number	Initial Called Number
Calling Information in the IPX-S300B		
18	Calling Type	Caller Type

No.	Parameter	Description
		- 0: Unknown - 1: User - 2: Service - 3: Trunk (End Point Type) - 4: Application Server Type
19	Calling IP	Calling IP Address
20	Calling SIP URI	Calling SIP URI
21	Calling User Group	User Group to which the caller belongs
22	Incoming Route	Incoming Route Number
Called Information in the IPX-S300B		
23	Called Type	Called Type - 0: Unknown - 1: User - 2: Service - 3: Trunk (End Point Type) - 4: Application Server Type
24	Called IP	Called IP Address
25	Called SIP URI	Called SIP URI
26	Called User Group	User Group the called belongs
27	Outgoing Route	Outgoing Route Number
Disconnect Reason		
28	SIP Status Code	SIP Status Code
29	Q850 Release Cause	Q850 Release Cause
30	Internal Fail Code	Internal Fail Code

CDR Format

No.	Parameter	Description
Header		
1	Sequence Number	00000000-99999999 The sequence number when recording in Call log File. This increases by 1 when CDR is generated. Reset when new log file is generated.
2	DP Type	CDR creating point (Sending/Receiving)
Number		
3	Calling Number	Calling Only
4	Current Calling Number	The last number used to be connected to sending
5	Calling Name	The last name used to be connected to sending
6	Dialed Number	The number input by user or received from incoming (number before the number conversion)

No.	Parameter	Description
7	Connect Number	The last number used to be connected to receiving
8	Connect Name	The last name used to be connected to sending
9	Billed Number	Bill Number (User's accounting code)
Usage (Time)		
10	Attempt Time	Time when the call is attempted
11	Call Duration	Call Duration Time (Disconnect Time-Answer Time)
12	Answer Time	Time when the call is connected
13	Disconnect Time	Call End Time
Calling Information in the IPX-S300B		
14	Calling Type	Caller Type - 0: Unknown - 1: User - 2: Service - 3: Trunk (End Point Type) - 4: Application Server Type
15	Calling IP	Calling IP Address
16	Calling User Group	User Group to which the caller belongs
17	Incoming Route	Incoming Route Number
Called Information in the IPX-S300B		
18	Called Type	Called Type - 0: Unknown - 1: User - 2: Service - 3: Trunk (End Point Type) - 4: Application Server Type
19	Called IP	Called IP Address
20	Called User Group	User Group the called belongs
21	Outgoing Route	Outgoing Route Number
Disconnect Reason		
22	SIP Status Code	SIP Status Code
23	Q850 Release Cause	Q850 Release Cause
24	Internal Fail Code	IPX-S300B Internal Fail Code
System Node Information (optional-only used in Active-Active Mode)		
25	System Node ID	System Node ID - 0: system node 0 - 1: system node 1
26	Inter-Node Data	- 0: My Node's Data - 1: Peer Node's Data Peer Node's Data can be ignored
27	GMT Offset	GMT offset Time

No.	Parameter	Description
Additional Information (optional)		
Refer to [MANAGEMENT > CDR Storage Options > CDR Option > CDR Format].		
28	Route Type	Code of route type - VOIP: FF00 - PSTN: 0000
29	Pilot Billed Number	Pilot Billed Number
30	Forward Type	Forward Call - 0: Non Forward Call - 1: Forward Call
31	Route Access Code	Route(Trunk) Access Code
32	Calling Dev Type	Calling device Type 0 = SAMSUNG_SIP 1 = SAMSUNG_SOFT 2 = SAMSUNG_MOBILE 3 = SAMSUNG_PC_ATTCON 4 = 3RD_SIP 5 = FXS 6 = FMS null = Call From route
33	Called Dev Type	Called device Type 0 = SAMSUNG_SIP 1 = SAMSUNG_SOFT 2 = SAMSUNG_MOBILE 3 = SAMSUNG_PC_ATTCON 4 = 3RD_SIP 5 = FXS 6 = FMS null = call to route
34	User Digit	Digit pressed by user
35	Pick up	Pick up - 0: Normal Call - 1: Pickup Call
36	Smart Routing	- 1:internal IPX-S300B Smart Routing Call - 2:inter-IPX-S300B Smart Routing Call
37	Transferer	User Number who transfers the call
38	Service Type	Service Type which is applied to the call Refer to 'IPX-S300B _CDR Interoperability Guide'.
39	Auth Code	Authorization code used for outgoing call
40	Calling Reg Location	Calling Subscriber Register Location - 1: Internal Wi-Fi - 2: External Wi-Fi - 3: mVoIP

No.	Parameter	Description
41	Called Reg Location	Called Subscriber Register Location - 1: Internal Wi-Fi - 2: External Wi-Fi - 3: mVoIP
42	Reserved field	Reserved field for CDR expansion
43	Reserved field	Reserved field for CDR expansion
44	Reserved field	Reserved field for CDR expansion
45	Reserved field	Reserved field for CDR expansion
46	Reserved field	Reserved field for CDR expansion
47	Reserved field	Reserved field for CDR expansion
48	Reserved field	Reserved field for CDR expansion
49	Reserved field	Reserved field for CDR expansion
50	Reserved field	Reserved field for CDR expansion

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End

PostgreSQL Database Management System

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ABBREVIATION

A

AA	Auto Attendant
AAR	Automatic Alternative Routing
ACD	Automatic Call Distribution
ACL	Access Control List
AME	Answering Machine Emulation
APC	Access Point Controller
AR	Alternative Route

B

BHCA	Busy Hour Call Attempt
BLF	Busy Lamp Field

C

CAC	Call Admission Control
CDR	Call Detailed Record
CID	Caller Information Data
CLI	Calling Line Identification
CLIR	Calling Line Identification Restriction
COA	Change of Address
COS	Class of Service
CPS	Call Per Second
CSTA	Computer Supported Telephony Application
CTI	Computer Telephony Interface

D

DID	Direct Inward Dial
DISA	Direct Inward System Access
DN	Directory Number
DND	Do Not Disturb
DOD	Direct Outward Dial
DR	Direct Route
DTMF	Dual Tone Multi-Frequency
DTS	Direct Trunk Select

F

FMS	Fixed Mobile Substitution
FTP	File Transfer Protocol
FXO	Foreign Exchange Official
FXS	Foreign Exchange Station

G

GW	Gateway
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H

HTTP	Hyper Text Transport Protocol
HTTP	Hyper Text Transport Protocol over Secure Sockets Layer

I

iBG	integrated Business Gateway
ICMP	Internet control message protocol
iES	integrated Ethernet Switch
IGMP	Internet Group Management Protocol
ITSP	Internet Telephony Service Provider
IVR	Interactive Voice Response

L

LDAP	Lightweight Directory Access Protocol
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M

MCN	Modification Calling & Called Number
MCS	Multimedia Conference System
MOBEX	Mobile Extension
MOH	Music On Hold
MP	Main Processor
MPEG	Moving Picture Experts Group
MPS	Media Proxy Service
MWI	Message Waiting Indication

N

NAT	Network Address Translation
NFC	Near Field Communication
NMS	Network Management System
NTP	Network Time Protocol

P

PBX	Private Branch eXchange
PMS	Property Management System
PNP	Plug and Play
PSTN	Public Switched Telephone Network

R

RADIUS	Remote Authentication Dial In User Service
RFC	Request For Comments
RST	Reset
RTP	Real Time Protocol

S

SBC	Single Board Computer
SCM	Samsung Communication Manager
SIO	Serial Input and Output
SIP	Session Initiation Protocol
SMDR	Station message detailed record
SMS	Short Message Service
SNMP	Simple Network Management Protocol
SNTP	Simple Network Time Protocol
SRTP	Secure Real-time Transport Protocol

T

TCP	Transmission Control Protocol
TFTP	Trivial File Transfer Protocol
TLS	Transport Layer Security

U

UC	Unified Communication
UMS	Unified Messaging System
UPnP	Universal Plug and Play

V

VM	Voice Mail
VMS	Voice Mailing System
VoIP	Voice over Internet Protocol

W

WE	Wireless Enterprise
WiFi	Wireless Fidelity

SCM Compact (IPX-S300B) System Description

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