NIPX-Series IP PBX (NIPX-1000|1000S|128T) System Description

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1. Overview

NIPX Series Hybrid IP PBX, the new generation of integral digital network wireless switching system developed by KYLINK COMMUNICATIONS CORP, provides multiple terminal interfaces, able to be directly connected with analog telephone, digital key telephone, digital multi-channel recording system and other equipment with functions of Caller ID, ISDN BRI/PRI, Magneto, E&M, wireless communication; in addition, it also can combine the information network to provide VOIP service and enables individual modules scattering in different areas to constitute a integral switching network. Not only saving cost but also can span people in different locations in a same system. inbuilt added-value functions of DISA for your option.

On the external communication network, NIPX-Series can connect PSTN, ISDN and IP Network and provide the most complete voice service in combination with wireless communication. Users can own a set of perfect, economical and powerful switching communication system.

The NIPX-1000/1000S has duplicate Power、 CPU and Switching design. When one of the part suffers from failure, it will alarm and automatically switch to the backup unit to keep working in general.

2. System Architecture

2.1 Function Diagram of NIPX-128T
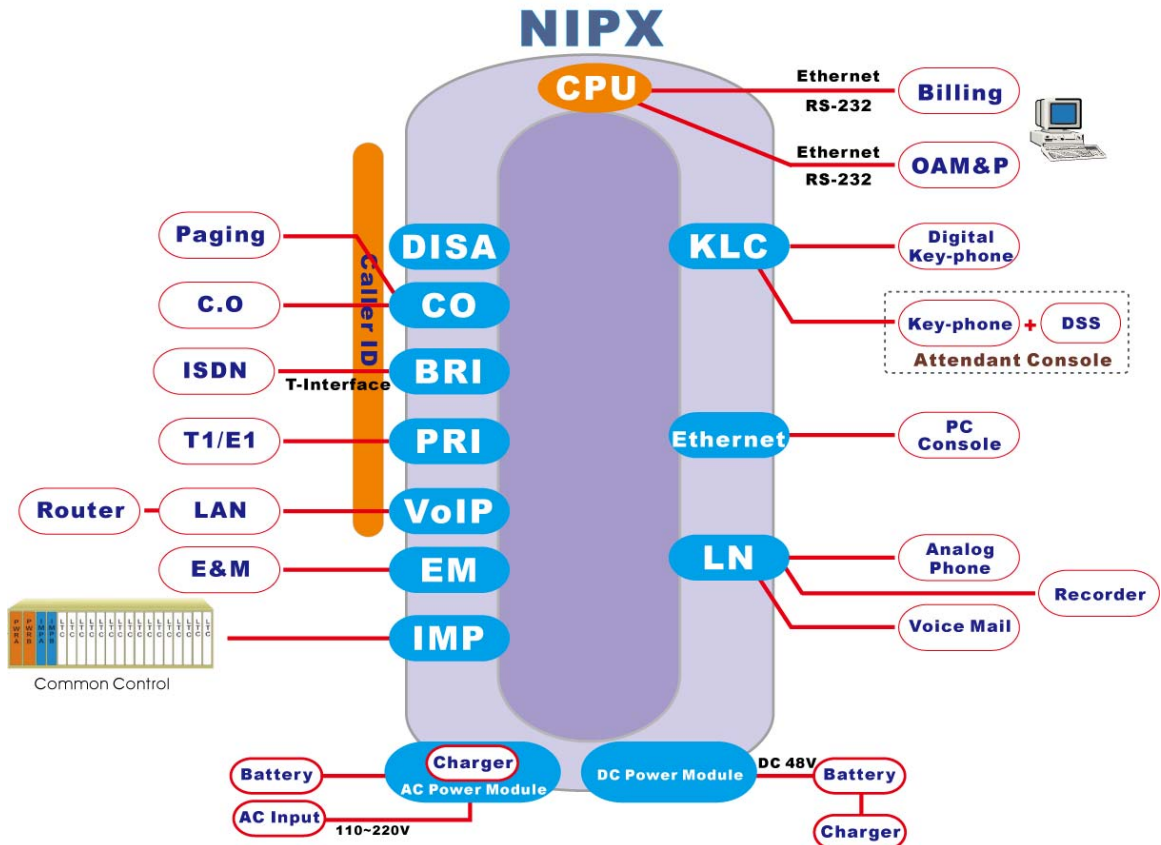
Trunk

    C.O.：Central Office

    BRI：Basic Rate T-Interface

    PRI：Primary Rate Interface

    DTK: E1/T1 Digit Trunk

    VoIP：Voice over Internet Protocol Trunk (SIP/H.323)

    GSM：Global System Mobile Card

    E&M：E&M Interface

    RD : Magneto Trunk

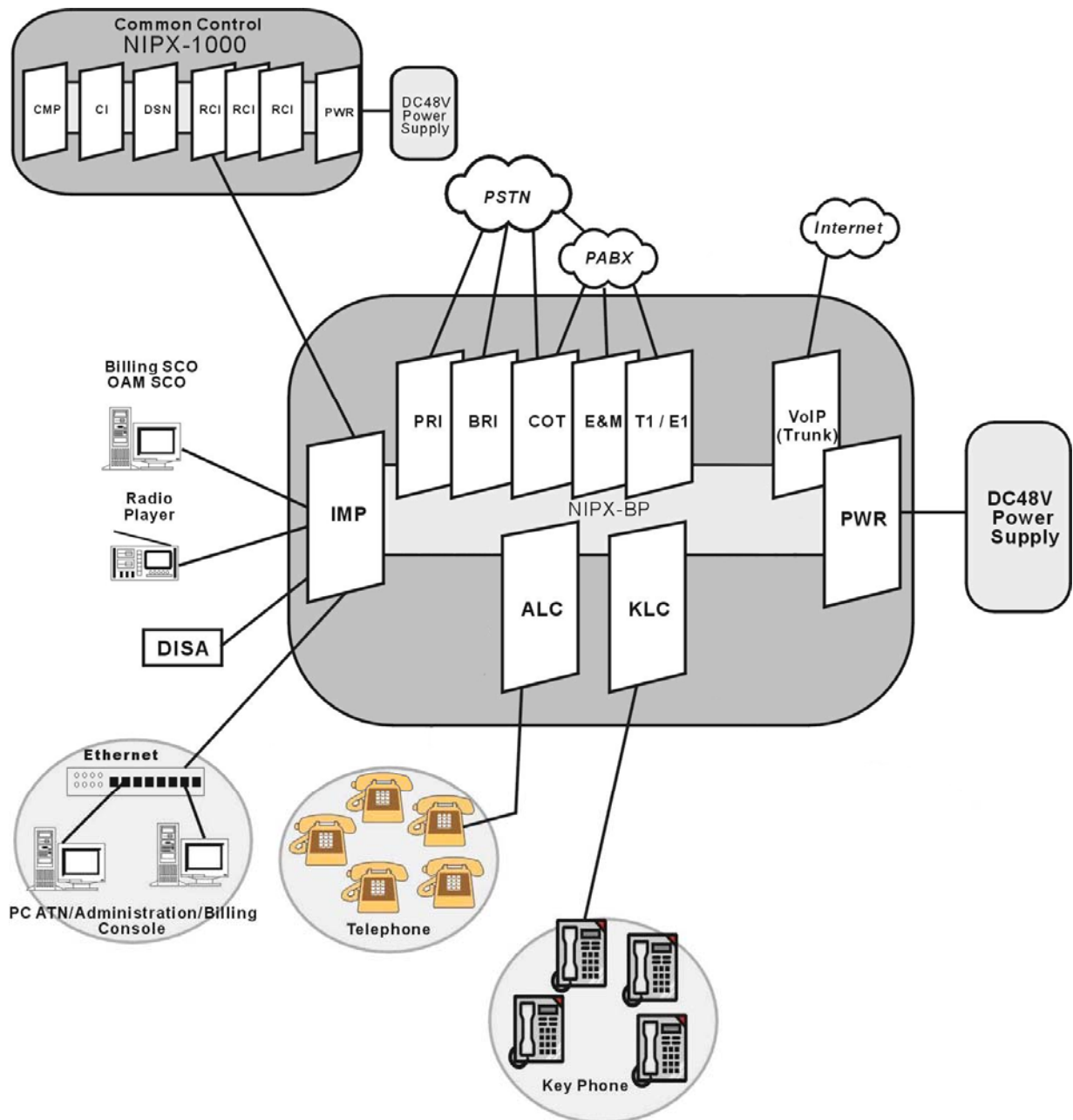   MTK: Multi-protocol Trunk (SS7 and QSIG)

Extension

    KLC：Key-telephone Line Card (Digital Telephone Interface)

    ALC：Analog Line Card (Single Line Telephone Interface)

Peripheral

    Ethernet：IEEE 802.3 Ethernet Port

         (for Billing &Administration & Operator Console).

    RS-232 : Series port for Billing &Administration Console.

2.2 Function Diagram of NIPX-1000/1000S

2.3 Configuration

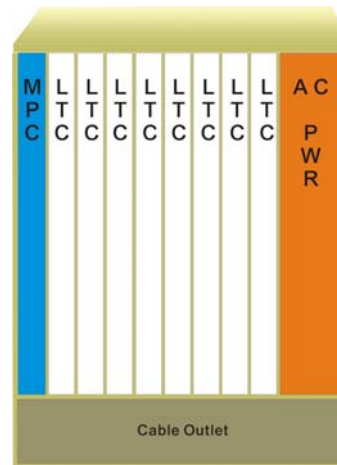### 2.3.1 NIPX-128T - 128 Ports/cabinet.

Front View   Card Slot Assignment

（NIPX-128T supports DC power card for option）

2.3.2 NIPX-1000S Shelf - Up to 256 Ports

Front View

Card Slot Assignment
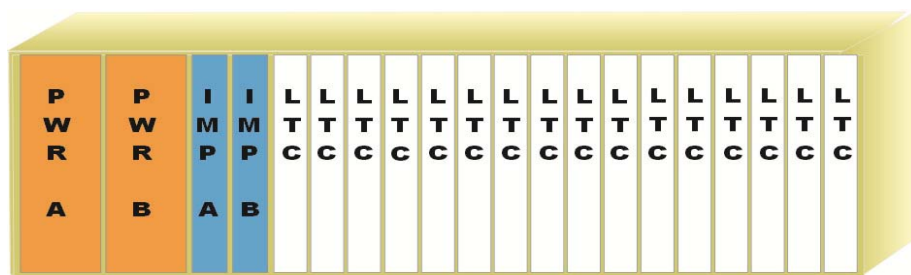
NIPX-1000S Cabinet - Up to 512 Ports when stack 2 shelf.

Front View

Card Slot Assignment
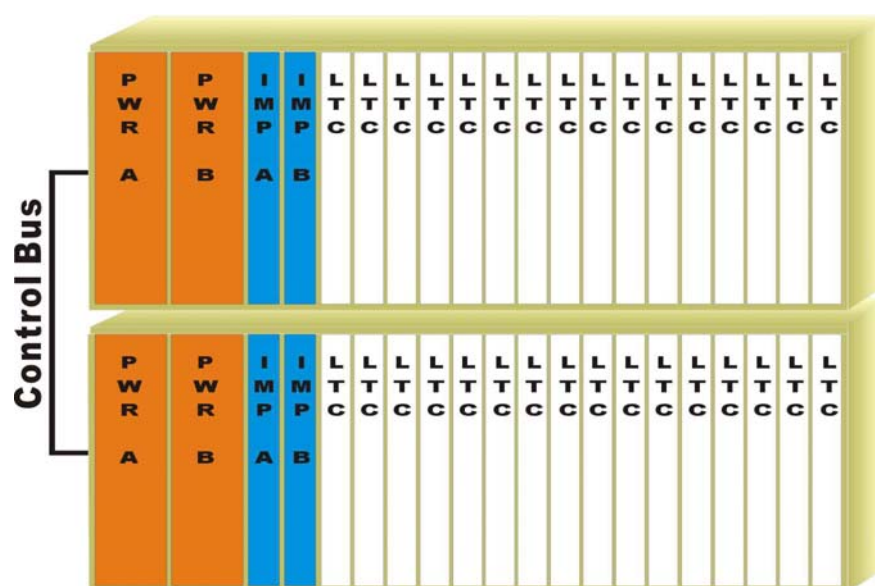
2.3.3 NIPX-1000 Cabinet - Above 7000Ports

Front View
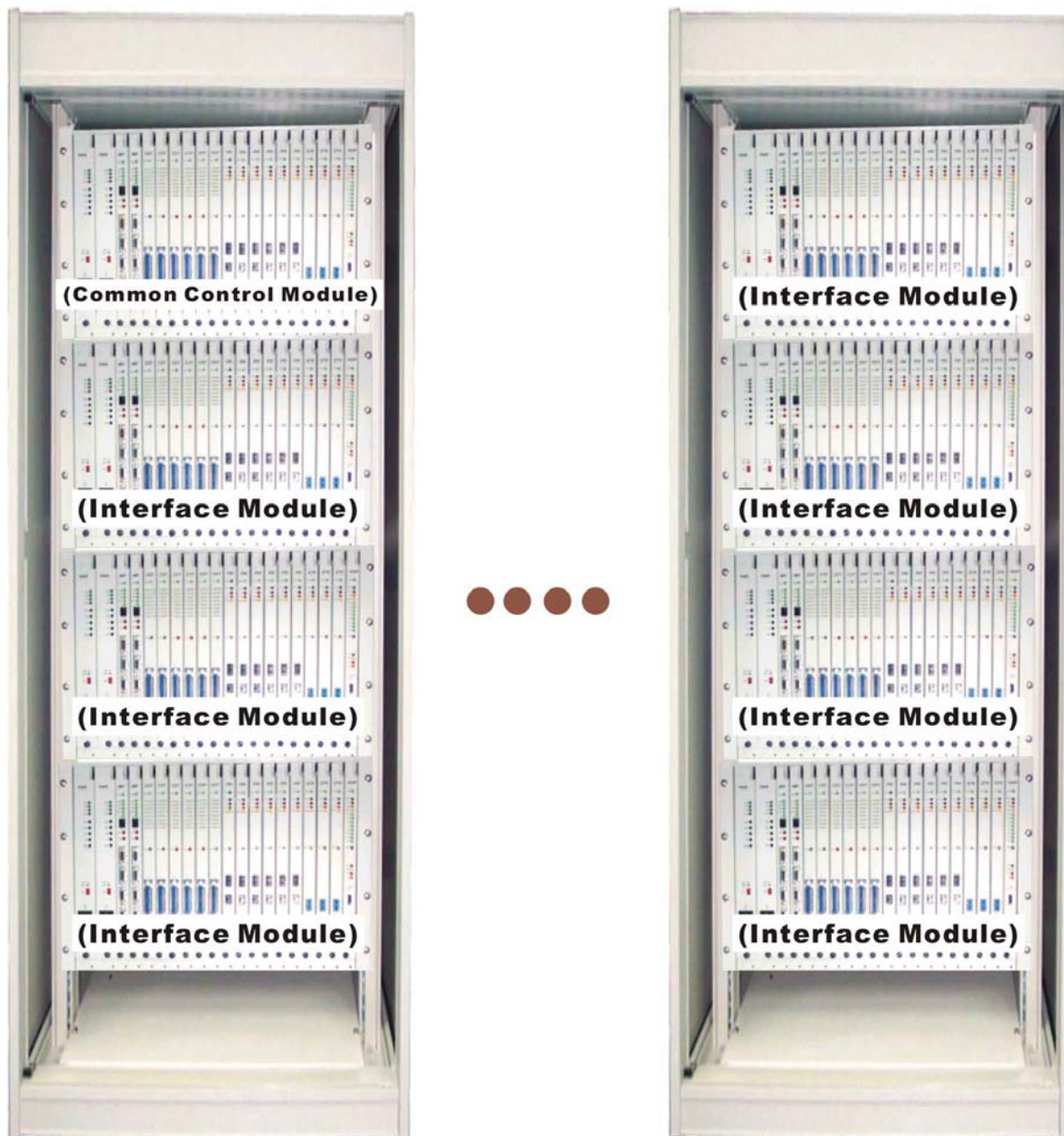
Card Slot Assignment
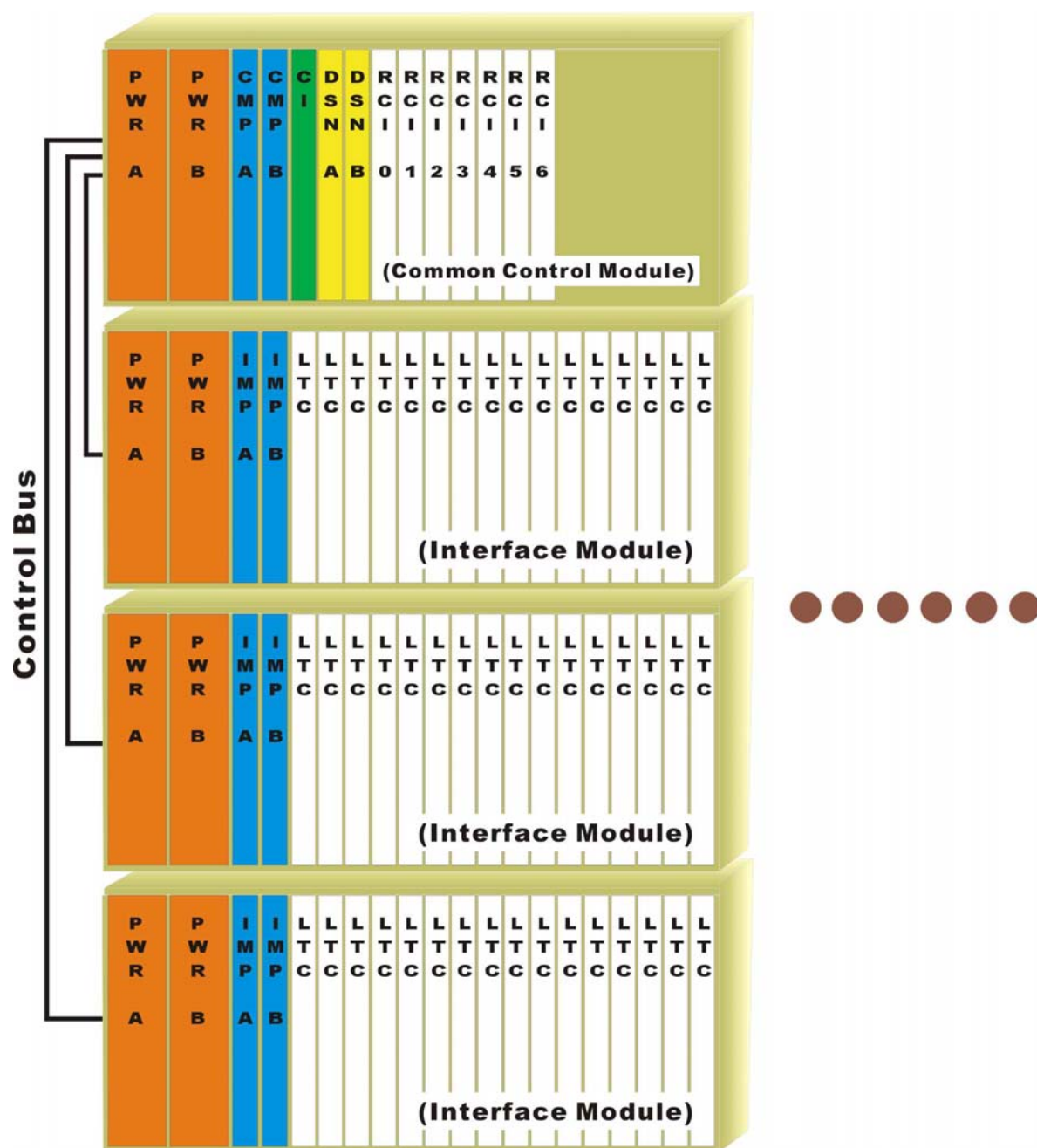
2.3.4 KY810 Key-telephone Description

Front view:

(1) Handset   (6) Numeric keypad
(2) Speaker   (7) Function keypad
(3) Handset cord   (8) Programmable key (defined by users)
(4) Hand free button   (9) Display
(5) Microphone
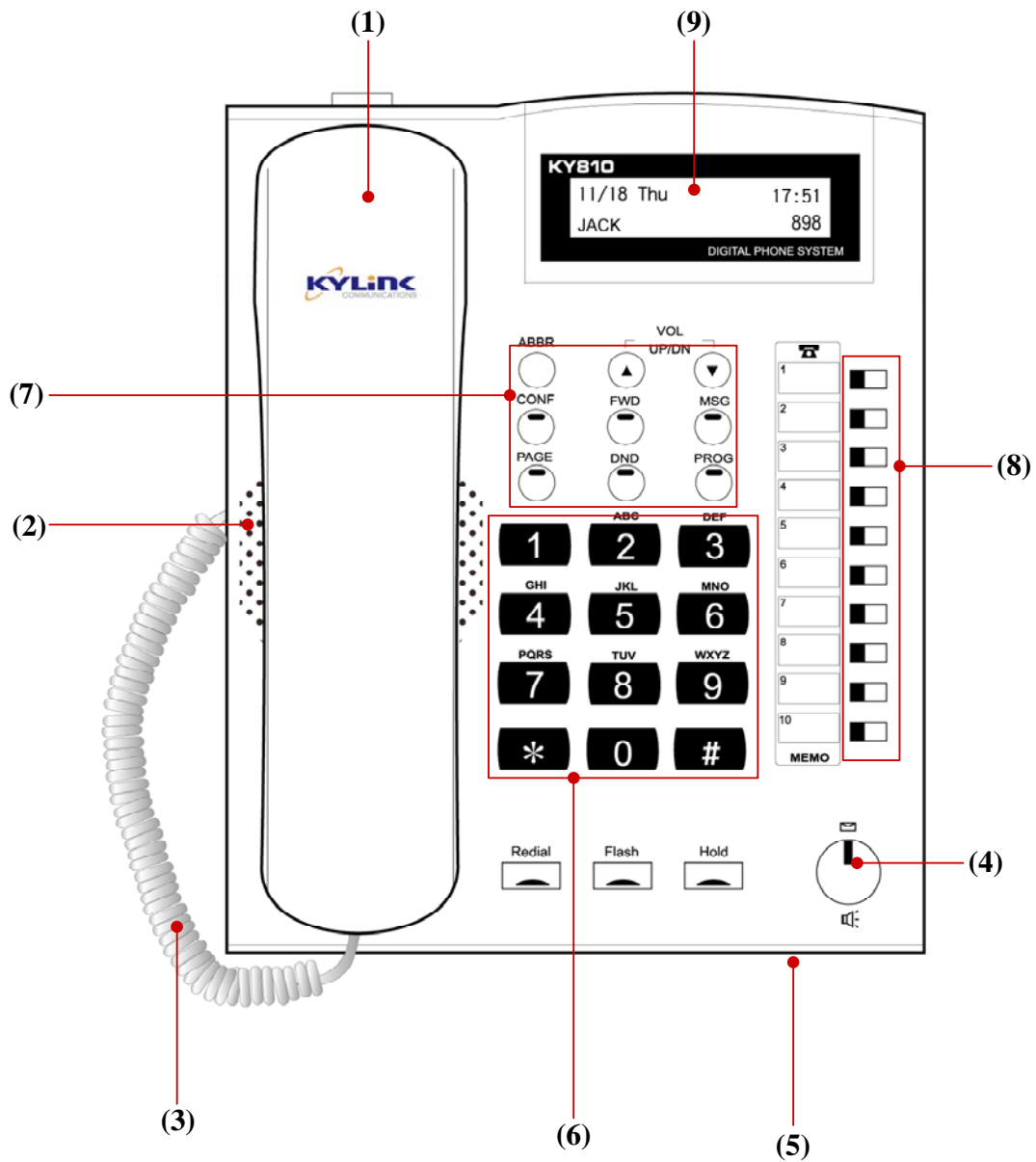
Rear View:

    (1) Fixed screw
    (2) Skid-proof pad
    (3) Hanging hole
    (4) Wire holder
    (5) Jack for DSS console (RJ-11、6P6C)
    (6) Jack for handset (RJ-9，4P4C)
    (7) Jack for line (R11，6P2C)
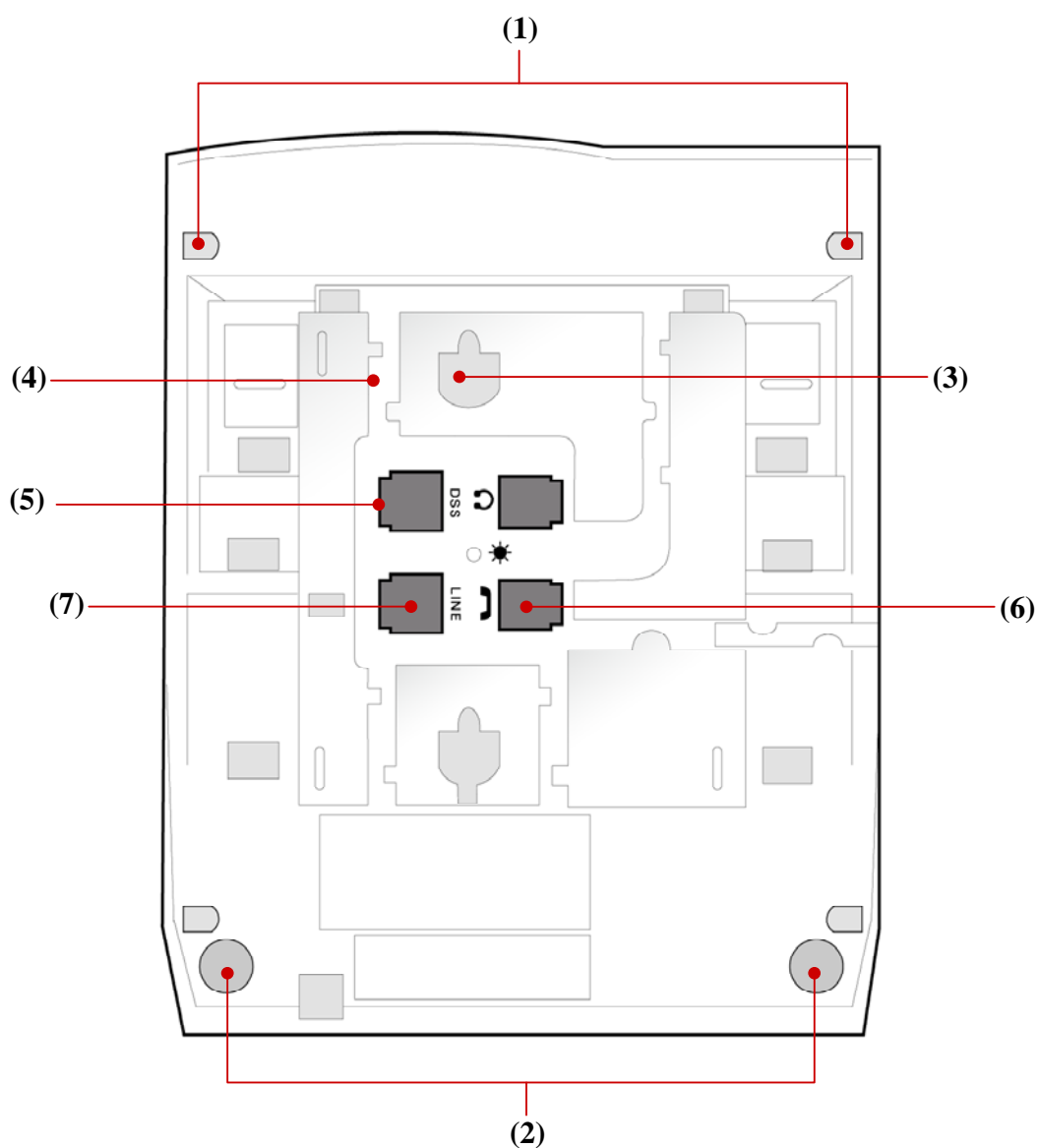
3. Card List

3.1 Master Processor Control (MPC) Card (for NIPX-128T only)
3.2 AC Power Card (AC PWR) Card(for NIPX-128T only)
3.3 Analog Line Card (ALC)
3.4 Key-telephone Line Card (KLC)
3.5 Central Office Trunk (COT) Interface Card
3.6 Hybrid CO/ALC Card (CO/ALC)
3.7 Hybrid CO/KLC Card(CO/KLC)
3.8 E&M Trunk Interface Card (EMC)
3.9 E1/T1 Digital Trunk Card (DTK)
3.10 Primary Rate Interface (PRI) Card
3.11 Basic Rate T-Interface (BRI) Card
3.12 Voice Over IP(VOIP) Trunk Card
3.13 Global System Mobile (GSM) Card
3.14 Ring Down (RDC) Card
3.15 Power Supply Module (PWR) Card
3.16 Control Module Processor (CMP) Card (for NIPX-1000 only)
3.17 Digital Switch Network (DSN) Card (for NIPX-1000 only)
3.18 Remote Control Interface (RCI) Card (for NIPX-1000 only)
3.19 Communication Interface (CI) Card (for NIPX-1000 only)
3.20 Interface Module Processor (IMP) Card (for NIPX-1000/1000S)
3.21 Multi-protocol Trunk (MTK) Card

4. Benefits

4.1 Wireless Communication
For rural area, fixed line can't be served from PSTN, NIPX GSM card can access with GSM service provider and it can be used on GSM900 and GSM1800 system.

4.2 VoIP

NIPX provides the most advanced VoIP technology. It can easily provide the voice over IP service by adding an interface card. It can enhance enterprises' network margin and save call cost.

4.3 Flexible Configuration

NIPX allows the system to configure from 16 ports to 7000 ports depends it's model. Modularity gives the system the ability to be expanded from its minimum configuration to its maximum capacity as the need arises.

4.4 Easy Maintenance

NIPX supports Windows Base, which allows user to friendly operate. It also has remote maintenance and management function via RS-232 or Ethernet port. In case of a fault, the self-diagnostic programs will detect the fault and report automatically.

4.5 Efficient and Compact design

NIPX employs state-of-the-art technology in the system circuitry design to reduce the system power consumption and achieve high reliability. It uses SMT technology to save space. As a result, the NIPX has a compact size that can be installed anywhere in the office or be mounted on the wall as well.

5. System features

5.1 Common Control
5.1.1 CPU
The system CPU utilizes 32 bits RISC ARM 7 CPU.

5.1.2 Stored Program Control
NIPX PABX utilizes stored program control method (SPC). When power supply is temporarily interrupted and then recovered again, NIPX download the system program and database automatically from flash memory and resume to normal operation.

5.1.3 Switching Network
The switching network is using digital, time division multiplexing (TDM) and pulse code modulation (PCM). The sample of codec is 8KHz. PCM code can select A-Law or μ-Law.

5.1.4 Built-in DISA (Option)
CPU can be added a DISA module to offer auto attendant features by software programming. DISA provides various incoming calls' greeting voice services. The users can record their own voice services by phone set.

5.1.5 Remote Control
Remote control through modem or Ethernet port, it's easy to maintain and monitor the system.

5.2 Network Integration

5.2.1 Tandem
NIPX provides a flexible numbering plan to meet all forms of network integration service. The trunk provides Stored and Forward function and allows to add/reduce digits；it also provides prefix identification function (Such as 02″ is Taipei, "07″ is Kaohsiung). It allows setting the individual incoming/outgoing trunk restriction function to avoid illegal dialing.

5.2.2 Automatic Route Selection (ARS)
The system has tandem function, automatic route search to connect with all kinds of telecommunication networks or comply with other PBX systems.

5.3 Extension Features

5.3.1 Caller ID
This feature displays the incoming call's telephone number or name on the LCD of the telephone for the calling party

5.3.2 ACD
The system provides Automatic Call Distribution function; it can distribute the incoming call to attendant consoles or extensions. The methods include sequential, circulation and traffic handling.

5.3.3 Distinctive Ringing
The system can set two kinds of ring tone for different calls as below：
  A. Extension intercom
  B. Trunk incoming ringing tone

5.3.4 Specified Incoming Calls Connect to Preset Extensions (256 groups)
With caller ID function, the system can transfer incoming call to preset extension or extension group. This setting can be released under other operation modes such as night service, holiday service etc.

5.3.5 Call Restriction
Restrict call time service can set the different call duration and service class in accordance with extension's service class. The system also provides the alert tone to notify the user that connection is going to be cut off within a specified time limit.

5.3.6 Caller ID
Caller ID recognized on both digital and analogue phone, system

support maximum capacity of extension to display the caller ID.

5.3.7 Extension Lockout
This feature provides an alert tone when extension remains off-hook after a call is completed or when extension is off-hook and digits are not dialed within a specified time limit.

5.3.8 Speed Dialing
The system provides 1000 sets of speed dials for attendant console and extensions.

5.3.9 Specified Trunk
The system can set specified trunks for certain extensions for outgoing call. The specified trunks will not be accessed by other extensions. The specified trunks' incoming calls can be transferred to another extension or trunk.

5.3.10 Trunk to Trunk Transfer
This feature allows any extension user to establish Trunk-to-Trunk Transfers between two CO/PBX (a disconnect signal must be provided), DID and/or Tie line calls.

5.3.11 Group Hunting
The extensions of the same department or section can be arranged to be a same hunting group, and then the system will give a representative number. When calling party calls representative number, the system will search and ring an idle extension. (The search method can be cycle or sequential.)

The system can create up to 240 groups for extensions and up to 240 groups for trunks. The ways to set groups are overlap and intersection.

5.3.12 Group Link
The extension groups can be linked by the system and set its link sequence (4 groups maximum/ 32 extensions of each group maximum) to pick up the incoming call by any extension of linked groups with dialing an access code.

5.3.13 Conference Call
The system can set up 8 groups of conference calls. Each group has a joint conversation with up to 8 people.

5.3.14 Secret Call
Any extension or attendant console cannot execute override to this extension to prevent interference or monitoring.

5.3.15 Hot Line

The system has hot line service for extension to extension or extension to trunk. When the extension goes off hook, the system will connect to the hot line automatically without dialing numbers.

5.3.16 Delay Call
The extension will connect to a special extension or trunk, while the extension keeps off hook without dialing more than a certain time

5.3.17 Night Service
The system can be changed to night service mode by presetting time or through manual operation to assign specific extensions or extension groups to answer incoming calls.

5.3.18 Class of Service
The system provides extension/attendant console various classes of services.

5.3.19 Portable Extension Setting
Portable extension password makes convenient for the user to input his password at any extension. The system will replace service class to his class. The user just needs to logout to retrieve the original service class of that extension.

5.3.20 Emergency Calling
This function allows releasing the busy trunk to make an emergency call such as fire department, police department, hospital etc. without dialing trunk access code "0"

5.3.21 Malicious Call Tracing
The system will monitor and record all incoming calls of specified extension.

5.3.22 Alternative Code of Prefix
System provides 64 groups of alternative code for prefix, most of application in DID incoming.

5.3.23 Trunk Group Reroute
If trunk group is busy, system can reroute to another trunk group, it can link to 3 trunk group.

5.3.24 Calling Number Priority Answer
According to calling number, call can be answered by preset of party when an call is incoming.

5.4 DISA Features

5.4.1 Voice Answering Service

1. Incoming calls answered automatically.
2. Status announcement during making a call transfer.
3. The incoming call will be guided to transfer to the operator or another specified extension when the called extension is locked.

5.4.2 Setting Voice Announcement

1. To set up yearly working and non-working days.
2. To set up different announcement for different time section in a day.
3. To set up the special announcement for special situation like typhoon by dialing into the system.
4. To set up the guiding announcement for departments' extensions.
5. To support 4 kinds of languages for voice announcement.
6. The ways to automatically handle of call timeouts:
   A. Release the line automatically.
   B. Transfer to the operator.
   C. Transfer to specified extension.

5.4.3 Features

1. It has 8 sets of DTMF receivers to serve 8 incoming calls simultaneously.
2. It utilizes ADPCM technology for voice channel.
3. All recorded voice announcements are stored in Flash Memory.
4. It can detect busy tone to release the line after the caller hangs up.
5. Built-in calendar.
6. Number filter.
7. Two calls flow control.
8. Voice files and database backup.

6. Attendant Console Features

The Key-telephone or PC can be selected as attendant console to provide all kinds of operator's services.

Features：

1. Answer Key
   The console has answer keys with LED indication. The operator can answer any calls.

2. Display
   The console displays the calling information and calling status.

3. Incoming Call Alert During a Call
   The attendant console has the function of incoming call alert during the

conversation (including sound and lamp indication) to ensure it can be answered and handled at any time.

4. Night Transfer
   The system can automatically transfer day service to night service. (Please refer item 6 of the system function)

5. Self-test
   This console has self-test feature to see if it works properly.

6. Display Information
   The console can display date and time.

7. Extension Multiple Function
   The console can set various functions for extension user.

8. Ringing Volume Setting
   The operator can set the volume of the ring tone and voice volume respectively or set to be mute with lamp indication.

9. Password Login / Logout
   It has password (1-8 digits) to control unauthorized outgoing calls.

10. Auto Callback
    The incoming call will call back to operator if it is transferred and no answer within a specified time limit.

11. Programmable Function keys
    The attendant console has programmable function keys, which can set the extension number or trunk number on a specified key so that the operator just need to press that specified key to connect to the contrasted extension or trunk.

12. Transfer and Take Back
    It can transfer incoming call and take it back before it is answered.

13. Busy Override
    It can execute the override function to a busy extension.

14. External Zone Paging
    The operator can press the paging key to hold on the incoming call and start the external-paging device after answering incoming call. The called party can press specific number to answer it. If the incoming call is not answered within a specified time limit, it will call back to operator.

15. Direct Paging Access
    After holding on the incoming call, the operator can press function key or programmed function key to start internal digital key- telephone or extension

group's speaker to ask called party to answer the phone.

16. Split Feature
It can talk to calling party or called party alternately, or include two parties in a conference call.

17. Monitoring Feature
The operator can monitor any call of the extension or trunk.

18. Forced Release
The operator can execute forced release the connection between extensions and extension to trunk.

19. Specified Trunk
The operator can freely select specified trunk to use.

20. Call Pick Up
The operator can use pick up feature to answer ringing extension.

21. Superior Call
The operator can set the important incoming call number. When this number is coming, it will have tone alert and lamp indication to remind the operator to manage it first.

22. Speed Dialing
The operator can set 16 sets of individual speed dialing.

23. Conference Call
The operator can initiate a conference call.

7. Single Line Telephone Features

The system uses Analog Line Card (ALC) to connect with Single line telephone to provide some basic functions as below:

Features：
1. Auto Callback
No answer call back：The system will call back to original extension if there is no answer within a specified time limit

2. Extension Group
The extensions of same department or section can be set into a group. (240 groups maximum/ 32 extensions of each group maximum).

3. Secretary Feature
Any extensions of the system can have the secretary function to filter every

incoming call for executive.

4. Call Forward
   (1) Busy forward: This feature allows any incoming call to transfer to the specified extension or to attendant console when the called extension is busy.
   (2) No answer forward: The incoming call that is not answered within a specified time limit will be transferred to preset extension or to attendant console.
   (3) Follow me: This feature allows transferring any incoming call to the preset extension when the called party leaves his seat.
   (4) Call Forward- Off-Premises: This feature forwards a call to an outside telephone number.
   (5) Follow me with password: It allows enabling or disabling the follow me function at another extension.

5. Extension Relocation
   Extension numbers and features can be relocated by operating special steps.

6. Do Not Disturb
   When this feature is available, the extension can inhibit any incoming call.

7. Wake Up
   At programmable intervals, the system automatically calls the extension to remind the user of a scheduled time.

8. Call Quality Report
   If the call quality turns worse or has noise, the user can dial a specific code to inform service console and print out the extension number together with its contrasted extension or trunk for maintenance.

9. Call Waiting
   When receiving incoming call, you can put the current call on hold to answer the second call, and then switch them simultaneously.

10. Executive Override
    This feature can override called party and send an alert tone simultaneously.

11. Call Pick Up
    (1) Call Pick up direct: this feature allows an extension user to answer any calls directed to another extension.

    (2) Call Pick Up Group: any extension user can answer a call intended for another extension user either in their programmable Call Pick Up group or another Group, depending on the Call Pickup Access Code used.

12. Camp on Busy
    (1) If the called party is busy, the system will camp the incoming call on

called extension, and then call back under the condition that it is not answered within a specified time limit.

(2) When all the trunks are busy, the extension can reserve a trunk and will be called back when that trunk is idle.

13. Call Park

This feature allows the user to place a call into one of common Call Park-System locations from any extension. It allows the call to be removed from the extension and releases that extension to answer other calls. The call can be retrieved from System Call Park from any extension.

14. Speed Dialing

(1) Extension Speed dialing: Any extension can make outgoing calls or long-distance calls by using preset speed dialing from system.

(2) Personal speed dialing: the system provides 128 extensions of speed dials. Each extension has 16 Personal speed dials.

15. Last Number Redial

The system can record the last outgoing call of each extension. The extension can redial the last trunk outgoing number.

16. Password Dialing

Any extensions can make an outgoing call by accessing specified password and account code provided by the system. Password can be 1-8 digits.

17. Conference Call

The extension can initiate other extensions or join into a conference call.

18. External Zone Paging

The operator can press the paging key to start the external-paging device after answering incoming call. The called party can press specific number to answer it. If the incoming call is not answered within a specified time limit, it will call back to operator.

19. Direct Paging Access

After holding on the incoming call, the operator can press function key or programmed function key to start internal digital key- telephone or extension group's speaker to ask called party to answer the phone.

8. Key-telephone Features

The system uses KLC or COK digital interface to connect key telephones. It provides not only the single line telephone functions but also the following functions.

Features：

1. Programmable Key Definition
   The programmable key of the key-telephone is flexible design. It allows one touch operation. It can be programmed to be one touch dialing, multi-line operation, to generate group paging, specific trunk access, multi number in one telephone set etc.

2. One Touch Dialing
   The programmable key can be set to be a "one touch dialing" key. The system will access the trunk and send preset numbers when pressing it.

3. DSS
   Both DS26 and DS36 accommodate 26 and 36 programmable key for Direct Station Select keys to access specified extension, trunk, or trunk group

4. Multi-Line Hold
   The extensions and trunks defined by the programmable keys of the key-telephone can answer and hold the incoming call and then make another call. It can hold 8 extensions or trunks simultaneously.

5. Multiple Numbers
   Multiple extension numbers can be set in programmable keys. When one extension number is active and the other extension number has an incoming call, the telephone set is ringing and LED on programmable key is flashing. The called party can put the current call on hold and answer the other extension number's call.

6. Redial
   It can redial the last outgoing call numbers

7. External Zone Paging
   The operator can press the paging key to start the external-paging device after answering incoming call. The called party can press specific number to answer it. If the incoming call is not answered within a specified time limit, it will call back to operator.

8. Direct Paging Access
   After holding on the incoming call, the operator can press function key or programmed function key to start internal digital key- telephone or extension group's speaker to ask called party to answer the phone.

9. Save Numbers and Repeat
   This feature allows user to save the frequent used numbers in programmable key.

10. Environment Monitoring
    It can monitor other Key-telephones by accessing pre-set function codes

11. Volume Adjustment

(1) Ring tone volume: The ring tone volume can be adjusted or set to be mute.
(2) Voice volume: The voice volume can be adjusted. It will resume to the default condition after hanging up.

12. Message Display
(1) Connection message: It shows time and status when the extension is ringing, is during a call or is disconnected.
(2) Operation message: The Key-telephone shows message when it operates dialing, holding and transferring. It also shows error message when operating improperly.

13. Technical Specifications
（1）Cable connection: 2 wires connection, digital signal 2B+D, transmission distance can up to 600M (24AWG cable) at least.
（2）DTMF dialing keyboard.
（3）Function key features including hold, transfer, hand free, redial and volume adjustment.
（4）2x16 characters LCD display.
（5）DS26 and DS36 programmable keys (Dual color LED on each key).
（6）Ringing indicator.

14. Hand Free Dialing and Speaking
Hand free speaking, no need to pick up the handset when talking.

# 9. VoIP

9.1 VoIP Trunk

9.1.1 The system has VoIP Trunk interface card to provide IP Gateway feature. It supports H.323 or SIP protocol and offers telephone call features over the IP networks. It will enhance your Internet performances through saving call cost and improvement in enterprise competitiveness.

9.1.2 VoIP interface card provides 8 voice channels for communication.

9.1.3 Specifications
(1) Support IEEE 802.3 Ethernet 10/100 Base-Tx/RJ-45 standard
(2) Codec supported: ITU-T G.711, G.723.1 and G.729a/b
(3) Facsimile standard: ITU-T T.30, T.38 (Both side are Kylink's SIP only)
(4) Voice processing:
A. Voice Activity Detection
B. ITU-T G.168 Echo Cancellation
C. Comfort Noise Generation
D. Call Progress Detection
E. Gain Control

(5) Management:
    A. Telnet
    B. Local Management （RS-232/Service Console）
(6) Protocol stack: ITU-T H.323 or SIP.
(7) Support Caller ID
(8) Support Microsoft Net-Meeting and IP Phone
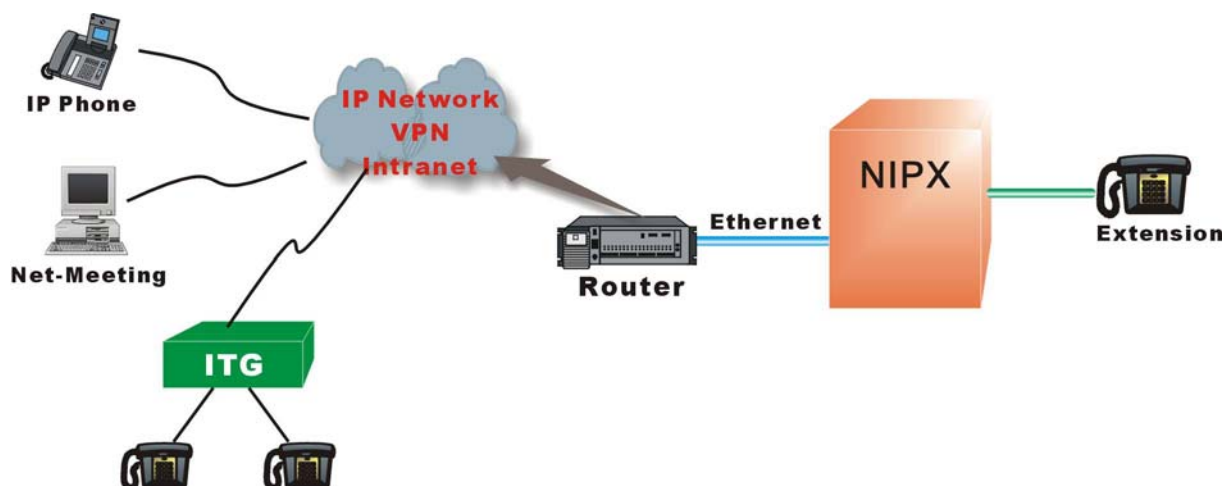
9.2 VoIP Extension(not available)

9.2.1 The system provide VoIP extension card for IP Phone connection , maximum 8 voice channels provided in each card , the voice channel is occupied only when IP Phone talk to the POTS , no need voice channel when talking between 2 IP Phones, maximum 64 number of IP Phone can be registerd in the system,it supports both LAN and WAN for IP Phone connected.

9.2.2 One RJ45 for 10/100 Base-T Ethernet connection that can be connect to LAN or WAN.

9.3.3 SIP protocol supported only.

9.3.4 The VoIP extension can make and receive call only , all of special functions not allowed for IP phone operation. For example call transfer, call forward, call pick up…etc.

9.3.5 Specifications
(1) Support IEEE 802.3 Ethernet 10/100 Base-Tx/RJ-45 standard
(2) Codec supported: ITU-T G.711, G.723.1 and G.729a/b
(3) Facsimile standard: ITU-T T.30, T.38 ((Both side are Kylink's SIP only)
(4) Voice processing:
    A. Voice Activity Detection
    B. ITU-T G.168 Echo Cancellation
    C. Comfort Noise Generation
    D. Call Progress Detection
    E. Gain Control
(5) Management:

      A. Telnet
      B. Local Management （RS-232/Service Console）
  (6) Protocol stack: SIP.
  (7) Support Caller ID

10. Operations, Administration and Maintenance(OA&M)

1. The service console can execute the following work by PC：
   (1) Software enhancement.
   (2) Specified items testing.
   (3) CPU and Memory testing under off line service.
   (4) Fault detection and isolation.
   (5) Terminals Testing.
   (6) Self-diagnostic
   (7) Status monitoring
   (8) Function setting
   (9) To update database and backup.
2. The software of system provides 4 maintenance layers, and has password to control its operating authority.
3. The software provides version display feature（Service & Billing Console）.
4. The software supports Windows Base, dual language (Chinese and English) and graphical user interface (GUI).
5. Abnormal Report Feature
   The system can be attached an external Modem to provide remote maintenance. It will make specified telephone number to connect to the maintenance center's computer and send abnormal information when the system operates improperly.
6. The system can start Self-diagnostic function and self-tested hardware/software with commands by itself or through Console. In case of broken down, the computer's monitor can show error message with alarm and report.
7. The audio alarm can be turned off by manual; the visual alarm can be deleted after resuming to normal condition.
8. Alarm message includes alarm type, time and date.
   Alarm Type
   (1) Critical
   This alarm type indicates that the troubles will make the system broken down. The troubles are as below:
       A. Power failure
       B. Receiver (DTMF, R1and R2) failure
   (2) Major
   This alarm type indicates that the troubles, which have damaged partial system, may cause some system functions to be ineffective. The troubles are as below:
       A.AC power failure
       B.Interface processing failure (pull/plug cards)

(3) Minor
This alarm type indicates that the following tasks will not make the system broken down.
A. Continuous loop

11. Billing System

1. Billing system has ability to record all calls; it also provides co-operate function with hotel, hospital, room-rental and restaurant.

2. Record data includes Caller ID, Extension number, call types, call in/out duration, answering duration, determinate calls duration and calls statistics.

3. Billing system reads extension groups detail phone bill records, includes print. Print types include extension number, groups, domestic and international (every call) and all calls usage phone bill records, which also provides statistics by day, half month and a month.

4. Adjustable bill rates by different locations.

5. International rates calculation, which can setup different rate combinations by nations or through VoIP.

6. Billing system using Chinese/English window-mode operation system (for windows 2000, 98 or XP) and it is easy for operators to use.

7. Billing data can report as an Excel file or text file.

8. Receive billing data via Ethernet or serial port.

12. Specifications

12.1 Equirements：

Item	Description	Remark
Operation Temperature	0℃~45℃	
Storage Temperature	-10℃~60℃	
Relative humidity	15~90%	
Power Supply	AC 110/220V Input or DC –48V Input	AC for NIPX-128T only
Ringing	75Vrms, 20/25Hz	
Power Consumption	300W	NIPX128T
Dimensions (H*W*D)	450*360*345(mm)	NIPX128T
Dimensions (H*W*D)	1100*700*600(mm)	NIPX1000S
Dimensions (H*W*D)	2000*700*600(mm)	NIPX1000
Weight		Depend on configuration
Installation	Cabinet or Rack mounted bracket（128T）	

12.2 Tone signal:

Tone signal type	Frequency & time period
DT1（00）	（350＋420）Continue
DT2（01）	（350＋440）Continue
BT1（05）	（450）0.5 sec ON 0.5 sec OFF
BT2（06）	（480＋620）0.25 sec ON 0.25 sec OFF
RBT1（02）	（420＋480）1 sec ON 2 sec OFF
RBT2（03）	（420＋480）1 sec ON 4 sec OFF
ROT1（07）	（400）0.5 sec ON 0.5 sec OFF
ROT2（08）	（400）0.25 sec ON 0.25 sec OFF
INS1（09）	（350＋440）0.5 sec ON 0.5 sec OFF
INS2（0A）	（350＋440）0.25 sec ON 0.25 sec OFF
WARNING TONE（04）	（450）0.5 sec ON 0.5 sec OFF
MUSIC（0B）	

12.3 Transmission Characteristic：

A. Extension loop and leakage resistance：
- Maximum loop resistance：1200Ω
- Minimum leakage resistance：20KΩ

B. Insertion Loss：
- Extension to extension：< 1±0.5dB
- Extension to trunk：< 1dB

C. Frequency Response：
- 300 ~ 600 Hz：-0.6 ~ +2.0 db
- 600 ~ 3000 Hz：-0.6 ~ +1.1db
- 3000~3400 Hz：-0.6 ~ +3.0 db

D. Return Loss：
Return Loss：> 16dB

E. Cross Talk：< -70dB

F. Idle Channel Noise：< -65dbm 0p

G. Longitudinal Balance：> 40dB(300 ~ 3000Hz)

H. Isolation resistance：Cabinet to line >5MΩ , cabinet to power >5M Ω , power to ground >10M Ω

13. Features

System features
- Tandem
- Prefix Code Identify
- Add /Reduce Digit service
- Stored and Forward
- Automatic Route Selection (3 layers)
- Flexible Number Planning
- Caller ID
- ACD
- DID/DOD
- Distinctive Ringing
- Specified Incoming Calls Connect to Preset Extension (256 sets)
- Call Restriction
- Extension Lockout
- Speed Dialing (1000 groups)
- Specified Trunk
- Message Lamp
- Call Transfer to Outside Line
- Extension Group (240 groups)

- Trunk Group (240 groups)
- Group Hunting
- Group Link (4groups/32extensins/each group)
- Conference Call (8 groups, 8 persons/group)

- Secret Call
- Hot Line
- Delay Call
- Night Service

- Class of Service
- Portable Extension Setting
- Emergency Calling
- Malicious Call Tracing
- Call Quality Report
- Self-test

DISA feature
- Auto Answering of Incoming Call
- Voice Volume Adjustment
- Voice Announcement of Transfer
- Release of Time Exceed
- Built-in Calendar
- Line Release Automatically
- Voice Announcement According to Time Section
- Transfer to Specified Extension
- Transfer to Operator
- Department Voice Guiding
- Busy Detect Automatically

Attendant console features
- Multi Answer Keys
- Busy Override
- Display
- External Zone Paging
- Incoming Call Alert During a Call
- Direct Paging Access
- Night Service
- Extension Attendant Assignment
- Self-test
- Split Feature
- Display Information
- Monitoring
- Extension Multiple Function
- Forced Release
- Ringing Volume Setting
- Specified Trunk
- Password Login /Logout
- Call Pick Up
- Auto Callback
- Superior Call
- Programmable Function Keys
- Speed Dialing
- Transfer and Take back
- Conference Call

Analog line telephone features
- Auto Callback
- Call Waiting
- Extension Group (240 groups)
- Executive Override
- Secretary Feature
- Call Pick Up
- Call Forward
- Camp On Busy
- Busy Forward
- Call Park
- No Answer Forward
- Speed Dialing (16 groups/128 extensions)
- Follow Me
- Last Number Redial
- Extension Relocation
- Password Dialing (1~8 digits)
- Do Not Disturb
- Conference Call
- Wake Up
- External Zone Paging
- Call Quality Report
- Direct Paging Access

Key-telephone set features
- One Touch Dialing
- Save Numbers and Report
- DSS
- Environment Monitoring
- Multi-line Hold
- Volume Adjustment
- Multiple Numbers
- Message Display
- Redial
- 2x16 Characters LCD Display
- External Zone Paging
- Programmable Keys (Dual color LED)
- Direct Paging Access
- Ringing Indicator
- Hand free dialing and speaking