Net Phone NP210 - Reference design

If you are looking for professional solution for terminal user's equipment of VoIP network, we have the right product for you - Voipac Net Phone 210. NP210 is IP phone, which operates independently (without PC) in the Ethernet network. Furthermore, it provides new applications such as Instant Messaging, Email, Calendar, etc.

Net Phone NP210

Application

- Cost-effective international and long distance voice communication
- SOHO telephone services between offices, while using IPPBX
- Phone to PC and PC to Phone
- Combined voice and data services provided via ISP and ITSP
- Jabber Instant Messaging client (compatible ICQ, Yahoo, AOL, Net Meeting...)

Benefits

- Cost-effective long distance Internet telephone calls.
- Maximum flexibility in selection of Internet calls or PSTN calls.
- Simple interface for ADSL/Cable Modem, or router with 2 Ethernet ports.
- Simple VoIP either using private or public high-speed Internet access

Description

The scope of "Fayn" service, provided by Voipac Company and its partners, is to provide PSTN and mobile operators' network access worldwide. To provide fully professional services, fine quality terminal equipment that is affordable and available for large scale of business and home users is must.
The terminal equipment possessing aforementioned characteristics is Net Phone NP210 supplied by Voipac Company.
NP210 is H.323v4 protocol compatible, upon your specific request we can develop a version that is SIP protocol compatible.
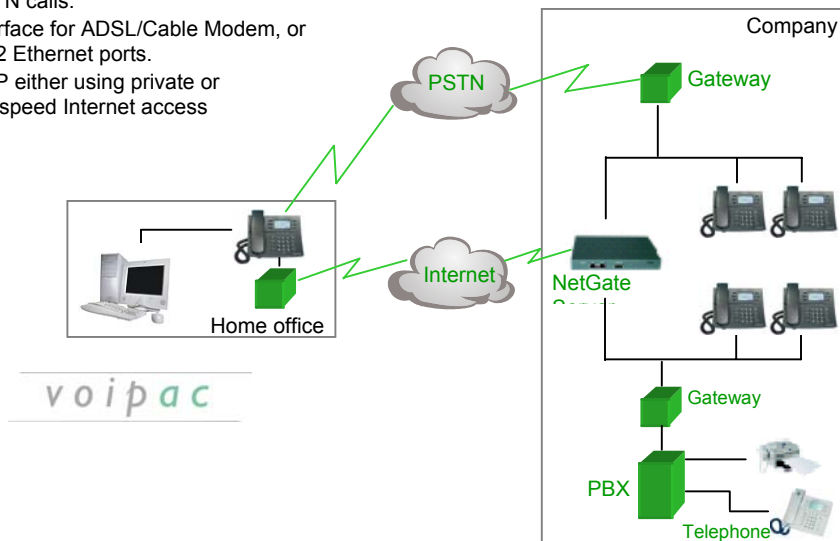As for platform, NP210 is built on Intel xScale technology. It includes two Ethernet ports (RJ 45) for LAN and PC connection. For connected PC, IP phone works like „bridge" or „Firewall-NAT" to LAN network with QoS integrated support. It contains 128 x 64 pixels, full graphics LCD display viewing date and time, call station name, dialed numbers and other information. There are 10 programmable buttons available for memory /quick dialing and 8 buttons for special functions such as HOLD, REC, SPEAKER, MUTE, ALT, CALL, etc. There is also a high-quality loudspeaker and microphone built-in.
NP210 supports H.323 compatible applications for voice transmission and web conferencing. The important feature is Instant Messaging support by Jabber service. Thus, the user can communicate with other ISM clients, such as ICQ, Yahoo Messenger, AOL.

Voipac Net Phone can be easily connected to ADSL/Cable modem interface thus providing cost effective and efficient VoIP service for household and SOHO users.

Characteristics

- Automatic IP address configuration via DHCP or static IP address
- Network modes
  - Bridge – both interfaces of IP phone are show as alone interface with one MAC address and IP address, for other network´s devices is connection through interface of phone transparent
  - FwNAT – in this mode IP phone includes LAN and WAN interface, both have MAC address and IP address, phone works in NAT mode as router and firewall amid LAN and WAN
- Fast Start and H.245Tunneling support
- H.450 services (Hold, Transfer, Forward)
- Automatic Gatekeeper Discovery
- Peer-to-peer mode (no Gatekeeper)
- 128x64 graphical LCD display
- LCD display: Time, Date, Caller ID, time of call, etc.
- Speaker phone
- Conference call
- Dialing of last 10 inputs
- 12 button keypad: 0 to 9, # and *
- Keypad entry for IP and Gatekeeper address configuration, etc.
- Mode of dialing selection/configuration
- Jabber Instant Messaging compatible
- Calendar
- Comfortable and well-organized menu
- Custom settings saving
- ON-hook dialing
- Caller groups
- 2 x LEDs
- QoS

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Services

- User Login
- User account status info
- Credit Charging (within Fayn network)
- Instant Messaging (Jabber)
- E-mail

Audio performance

- Echo cancellation G.168/G.165/G.167
- Programmable dynamic Jitter Buffer
- DTMF generation/distinguishing
- Gain/loss setting
- Ringing intensity regulation, speakerphone and micro-telephone adjustable volume

Management

- Password protection
- Secure Firmware Upgrade
- Software configuration via LCD display

Software

- Built on OS Linux
- H.323v4 stack
- IM client Jabber
- E-mail client
- SIP development possibility – based on customer´s request

Hardware

- Intel® XScaleTM Core Processor PXA255/200MHz
- FLASH – 32MB
- SDRAM – 64MB
- Large high-contrast, full graphics display
- Ethernet (10), (2x Ethernet 10) RJ-45
- Headset connector
- PS/2 interface for external keyboard
- RS232 console output

Supported codecs

- LPC-10
- GSM-06.10
- MSGSM
- G.711-uLaw, G.711-Alaw

Technical parameters

- Operating temperature ... 0 - 40°C
- Storage temperature ... -10 - 60°C
- Humidity ... 10 - 95%
- Dimensions ... 210x250x70mm (w, h, d)
- Weight ... 800g
- Max power consumption ...7W

Power supply
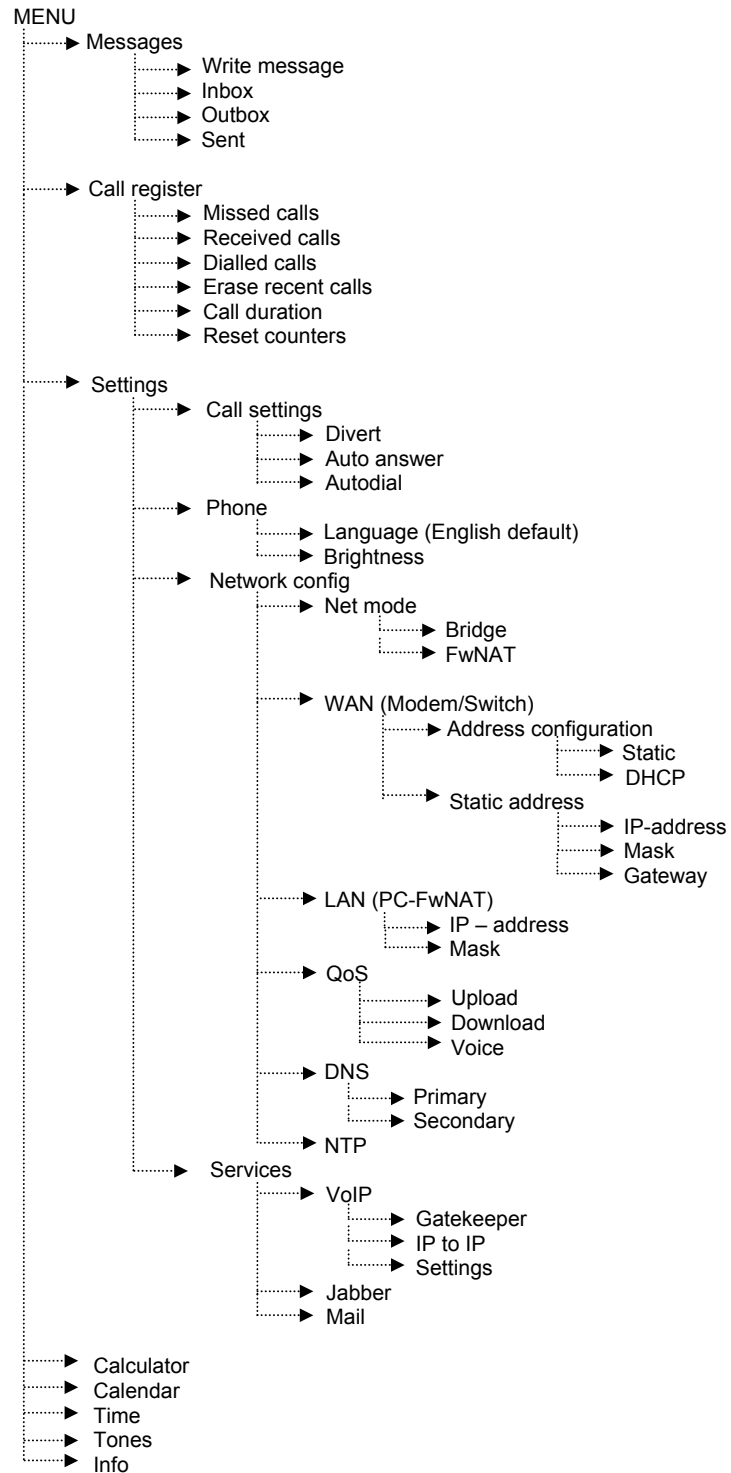
- External adapter DC 12V (600mA)

Software development kit

- Bootloader (ARM boot)
- File system support (JFFS2)
- Kernel v2.4.19 for ARM (source code)
- Flash burning utility
- Source code for keyboard controller
  (support for external PS/2 keyboard)
- Hardware testing applications
- IP phone hardware emulator software (Win32)
  for rapid application development (RAD)
- Time synchronization (NTP)

- Application source codes
  - ▶ IP Phone LIB
  - ▶ GUI Application
      Include support for backlight
      Simulator for RAD
      (rapid application development)

IP Phone LIB

- H.323 protocol compability - RAS
  protocol, H.225.0, Q.931, H.245
  protocol
- codec implementation G723, GSM,
  LPC, G.711 (A-LAW, u-LAW)
- RTP, RTCP
- Firewall pas trough
- DTMF (In band, Q.931, H.245)
- Authentification support H.235 – MD5
  hash, SHA1 algorithm, Cisco
  autentification algorithm
- Distributed conferencing support
- Multipoint controller unit
- Fast start support
- H.245 tunneling
- Primary and secondary Gatekeeper
  support
- HID - Human interface device, LID Line
  interface device
- Dinamic JITter buffer
- Silance detection
- Call forwarding

GUI Application

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MENU
├─▶ Messages
│         ├─▶ Write message
│         ├─▶ Inbox
│         ├─▶ Outbox
│         └─▶ Sent
│
├─▶ Call register
│         ├─▶ Missed calls
│         ├─▶ Received calls
│         ├─▶ Dialled calls
│         ├─▶ Erase recent calls
│         ├─▶ Call duration
│         └─▶ Reset counters
│
├─▶ Settings
│         ├─▶ Call settings
│         │         ├─▶ Divert
│         │         ├─▶ Auto answer
│         │         └─▶ Autodial
│         ├─▶ Phone
│         │         ├─▶ Language (English default)
│         │         └─▶ Brightness
│         ├─▶ Network config
│         │         ├─▶ Net mode
│         │         │         ├─▶ Bridge
│         │         │         └─▶ FwNAT
│         │         ├─▶ WAN (Modem/Switch)
│         │         │         ├─▶ Address configuration
│         │         │         │         ├─▶ Static
│         │         │         │         └─▶ DHCP
│         │         │         └─▶ Static address
│         │         │                   ├─▶ IP-address
│         │         │                   ├─▶ Mask
│         │         │                   └─▶ Gateway
│         │         ├─▶ LAN (PC-FwNAT)
│         │         │         ├─▶ IP – address
│         │         │         └─▶ Mask
│         │         ├─▶ QoS
│         │         │         ├─▶ Upload
│         │         │         ├─▶ Download
│         │         │         └─▶ Voice
│         │         ├─▶ DNS
│         │         │         ├─▶ Primary
│         │         │         └─▶ Secondary
│         │         └─▶ NTP
│         └─▶ Services
│                   ├─▶ VoIP
│                   │         ├─▶ Gatekeeper
│                   │         ├─▶ IP to IP
│                   │         └─▶ Settings
│                   ├─▶ Jabber
│                   └─▶ Mail
│
├─▶ Calculator
├─▶ Calendar
├─▶ Time
├─▶ Tones
└─▶ Info
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Hardware development kit

IP Phone Development kit includes
- Net Phone NP210-PRO (32MB FLASH, 64MB SDRAM)
- JTAG cable
- RS232 cable for console output
- Power supply

Documentation for complete hardware
- Schemes
- Gerber's files
- BOM file list
- Possibility to change the hardware according the customer request

Production's information

- Test report certificate
- Modified plastic case
- User guide in English and Slovak language
- Documentation for Industrial / retail packing
- Components suppliers
- Max costs of standard hardware (Flash 8MB, SDRAM 32MB, 2pcs Ethernet)

Actual Costs *	2Kpcs	10Kpcs	100Kpcs
Passive components	5,16 USD	4,73 USD	4,30 USD
Chips	50,40 USD	46,20 USD	42,00 USD
Plastic case, adapter, LCD display, other	12,23 USD	11,21 USD	10,19 USD
PCB charges	4,98 USD	4,57 USD	4,15 USD
Assembling and completisation	6,30 USD	5,78 USD	5,25 USD
TOTAL charges	79,07 USD	72,48 USD	65,89 USD

*As of November 2004

Notes:

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