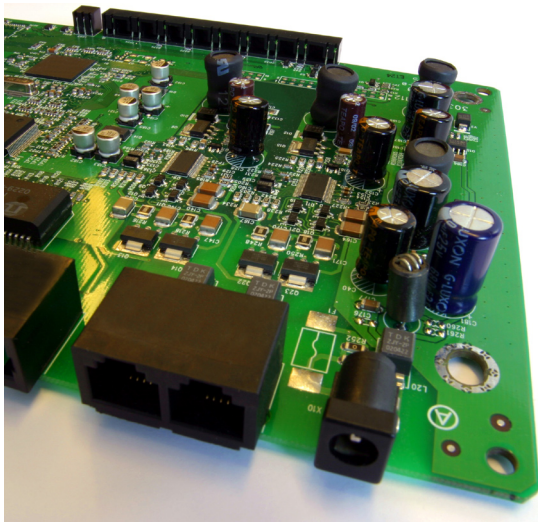




Embedded VoIP



42Networks' embedded VoIP (eVoIP) Design Packet provides easy integration of Carrier Grade Telephony Services to any CPE, enabling fast time to market. The packet includes world class software implementation for SIP, H.323, MGCP, H.248, and HW reference design. The packet can be integrated with all types of CPEs and network environments due to flexible design and various management system integration options.

Embedded VoIP (eVoIP)

42Networks eVoIP design packet is intended for vendors who require carrier grade telephony support in CPEs. The packet supports as standard 1, 2 or 4 POTS ports. 42Networks eVoIP packet is build around a well proven hardware and software concept with large number of ports shipped and in live operation world wide.

Time To Market

In order for any CPE vendor to meet the increasing demand from the market to provide VoIP services the eVoIP Design Packet allows implementation of carrier grade telephony support with world class Time To Market.

Software

The eVoIP packet supports all major VoIP protocols, i.e. SIP, H.323, MGCP and H.248. 42Networks own developed code provides maximum flexibility when doing integration in customer projects or designing proprietary features. The software has been interoperability tested with a large number of VoIP telephony systems.

Feature Rich IP-telephony Services

To use the IP-telephony services, the end user can use standard analog phones or G3 fax machines connected to the telephony ports.

A full range Class 5 services (e.g. call waiting, 3-party call, call forwarding, message waiting, Calling Number Presentation) are supported independently of the softswitch.

High Voice Quality

The eVoIP packet enables carrier grade voice quality through priority mechanisms both on Ethernet and IP levels. Line impedance, resistance, voltage, current and timing can be adapted for each market to ensure country specific setting and to maximize voice quality. Different speech codecs can be used allowing best possible bandwidth utilization.

Management Integration

The eVoIP packet can be integrated with the overall management system in a number of ways. The methods that can be used are for example SNMP interface, DHCP options, configuration file tool or integration of 42Networks Home Device Director, HDD, server with an existing management system platform.

42Networks Professional Services Offering

42Networks eVoIP solution enables complete outsourcing of VoIP. Besides software and hardware reference design 42Networks provides comprehensive professional services package including

- Software updates and upgrade services
- Software customization
- System integration
- Pre / post sales support
- 2nd and 3rd line support
- Market adaptations (ring signals, line impedances, clip format etc.)

Specification for Embedded VoIP

Interfaces

Model	Port	Specification	Distance
Telephony x1	Telephony	Analogue phone, RJ-11	500 m
Telephony x2	Telephony	2 x Analogue phone, RJ-11	500 m
Telephony x4	Telephony	4 x Analogue phone, RJ-11	500 m
Ethernet		MII (Media Independent Interface)	

Telephone and Fax services

VoIP protocols	SIP, H.323, MGCP, H.248
Speech Codecs	G.711, G.729ab, (G.723.1 available on request)
Class 5 services	Call Waiting, 3-Party Call, Call Alteration, Differentiated Ringing Signals, Call Forwarding, Calling Line Identification Presentation (CLIP), permanent and temporary CLIR (Calling Line Identification Restriction)
Fax	T.38
3rd Party initiated pause and rerouting	External rerouting of media stream during speech, e.g. for pre-paid calling card and record announcement
DTMF	Inband and outband using H.245, H.225, RFC2833 or SIP INFO
Number of telephones	Up to 5 analogue telephones can be connected to each telephone port
Market adaptation	Possible to set telephony signals, tones, cadences, impedance, CLIP etc. according to local market requirements

Management

SNMP management	SNMP v1, SNMP v2, MIB-II for statistics, Enterprise-specific DRG MIB for configuration
HTTP server	Two access levels for manual configuration, can be turned on/off remotely
TFTP/HTTP client	Software download
DHCP	Configuration support
HDD	Pre-integrated with 42Networks Element Management System, HDD, that allows optimal management of large populations of eVoIP units

Quality of Service

DiffServ	Layer 3 (IP) QoS mechanism, DSCP tagging of packets
Class of Service	IEEE 802.1p, Layer 2 (Ethernet) QoS mechanism, VLAN tagging of packets
Internal delay (VoIP)	5-30 ms delay for decoding/encoding/AEC/internal operations
General	Adaptive or flexible jitter buffer, echo cancellation (G.165, G.168), speech sampling 10-60 ms, silence suppression with comfort noise

Traffic Classification and Security

VLAN	Services and port separation
Authentication per registration	H225.0 RAS, SIP digest
Authentication per call	H235, SIP digest

Reliability

High Availability	Configurable high availability through secondary gatekeeper
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Physical and Environmental

Input voltage, unregulated	+12Vdc (1 POTS port 400 mA, 2 POTS ports 800 mA, 4 POTS ports 1600 mA)
Input voltage, regulated	+3.3 Vdc (1 POTS port 825 mA, 2 POTS ports 925 mA, 4 POTS ports 1125 mA)
Power consumption	Min 3 watts, typical 5 watts with 1 active telephone call
Operating conditions	For CPE operating in temperature range: +0°C to +45°C (commercial) or on a request for CPE operating in temperature range: -40°C to +85°C (industrial)

Subject to change without notice