Fraunhofer
IIS

FRAUNHOFER INSTITUTE FOR INTEGRATED CIRCUITS IIS

DECT
WIRELESS VOICE AND DATA COMMUNICATIONS

“DECT“ stands for “Digital Enhanced Cordless Telecommunication“ and is an accepted standard in more than 100 countries. Besides telephony, DECT is also geared for data transmission.

The Fraunhofer Institute for Integrated Circuits IIS develops DECT systems for voice and data communications. At the core of these systems is a piece of high-performance software which can accommodate all demands made of a DECT system. We offer to put our highly qualified development resources and ready-to-use hardware and software modules at your disposal.

You may either acquire DECT products in the form of existing DECT modules or obtain a license to manufacture DECT products. In either case, optional new functionality can be integrated into the software if required. In collaboration with our partners, we have developed a variety of products which range from highly versatile radio modems to customer-specific solutions.

Fraunhofer IIS has gained recognition for its DECT technology, for instance winning the Innovation Award from sponsoring society »Förderkreis für die Mikroelektronik e.V.«

Possible Applications

- Intercom applications
- Voice conferencing systems
- Mobile data acquisition or information systems
- Multimedia streaming
- Remote access
- Data transmission modules for professional environments
- Wireless networking of medical devices
- Wireless alarm and monitoring systems
- Data transmission modules for handheld devices
- Positioning systems

OUR OFFER

DECT HARDWARE AND SOFTWARE MODULES

Features
The main characteristics of DECT are as follows:

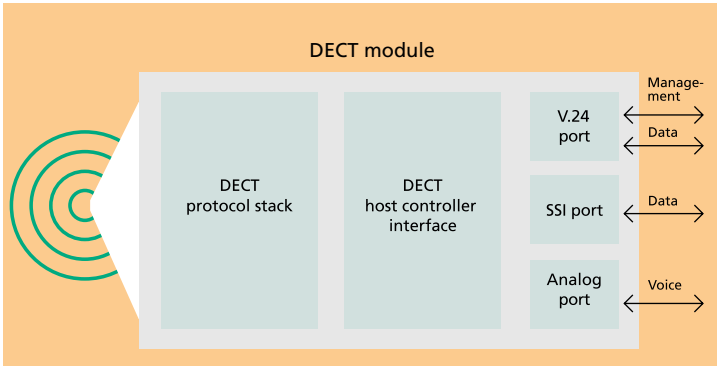
– Digital transmission system operating in the 1.88 to 1.9 GHz to frequency band (in the United States, a reserved frequency band is available since late 2004)
– Time and frequency multiplexing involving 24 time slots and 10 frequencies
– Both connection-oriented and connectionless communication
– 32 kbit/s gross data rate per time slot; time slots can be combined for higher data rates
– 250 mW peak transmitting power with an average of 10 mW per time slot
– Indoor range approx. 40 m, maximum range in free-field conditions approx. 350 m
– Possible configurations range from a single system with closed usergroups to a public-access picocellular network
– ADPCM-coded audio transmission

Advantages
DECT offers a number of advantages over other wireless solutions:

– Thanks to the reserved frequency band and deterministic access to the radio medium, mutual interference between DECT and other communications systems is reduced to a minimum.
– Deterministic access by means of time multiplexing enables you to monitor the reception quality and delay time.
– Date rate and error correction protocols can be adapted to application-specific requirements.
– No registration, no fees
– Definable access rights and security mechanisms
– Thanks to dynamic channel selection, several systems can be operated in parallel with no need for frequency planning.
– High system capacity
– The payload can be encrypted

DECT Hardware and Software Modules

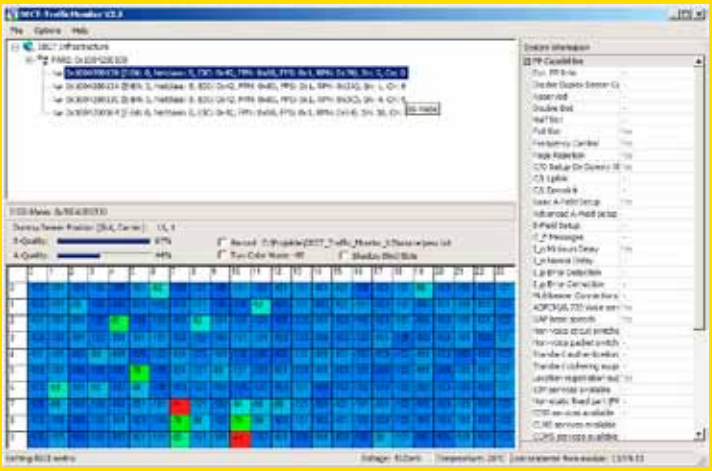
To make full use of the versatility of DECT data transmission, we have created a large selection of hardware and software modules.



Our DECT solutions are specially geared towards industrial applications. Among their features are a extended operating temperature range, integrated antennas, patented antenna diversity technology and customer-specific software.

The optional low-power mode permits high system density. Thanks to their deterministic mode of communication, the DECT modules are particularly suited to machine control and other controlling tasks.

Another key application area is distributed digital audio conferencing. Voice traffic can be encrypted (DECT standard Cipher DSC).



DECT Software

Both the DECT protocol stack and the operating system consist of several modules. Various microcontrollers and system-on-chip platforms are supported. Porting to other controllers is also possible. Along with the DECT protocol stack, we offer two different standard software interfaces so as to facilitate the implementation of DECT communications solutions in various scenarios – we have both an AT modem interface and a DHCI (DECT host controller interface) available.
The DECT software developed by the Fraunhofer IIS is geared for simultaneous data transmission and voice communications.

The DECT software architecture includes:
- DECT protocol for the air interface
- DECT Host Controller Interface (DHCI) oder optional AT-Modem Interface
- Asynchronous serial interface (V.24)
- Analog codec interface for voice connections
- Synchronous serial interface for external audio codecs etc.
- Optional advanced functionality such as multicell synchronization, conferencing and positioning

DECT Hardware

In order to facilitate the implementation of your solutions for voice and data networks, we have high-performance, power-saving, miniaturized hardware modules available which can be used as either base or mobile stations. System properties, interfaces and constructional features may be modified according to your specific needs.

DECT radio modules are able to simultaneously maintain data and voice communications between a base station and one or several mobile stations. Furthermore, mobile stations can communicate with one another via the base station. Our DECT radio modules are OEM modules designed to be built into mobile terminal equipment.

DECT Traffic Monitor

We have created a variety of tools for measuring and development support. One tool that has proved particularly useful in managing DECT radio cells is the DECT Traffic Monitor, which helps identify base stations, monitor the DECT frequency band and assess the reception quality.

This tool offers a sophisticated, intuitive user interface and is straightforward to use. Thanks to a graphic display of the field strength distribution, it is easy to keep close track of the traffic on DECT channels. Field strength measurements can be automatically recorded.
In addition, it is possible to display the performance characteristics of all base stations in the DECT Traffic Monitor's range.

Uses in Development, Installation and Maintenance
- Monitoring channel selection in DECT systems
- Monitoring performance of coexisting systems
- Identification of DECT systems in a given environment
- Analyzing the load distribution across the DECT frequency band
- Monitoring the reception quality of base stations
- Coverage planning in multicell systems
- Detection of interfering signals in the DECT frequency band

DECT Evaluation Kits

For testing purposes, we offer evaluation kits designed to help you gain an idea of how your application will benefit from DECT radio technology. The kits comprise several modules and ensure not only secure data transmission but also audio transmission in conformity with the DECT standard.
The data rate at the air interface is 24 kbit/s; voice and data communications can be handled simultaneously. The RS232C serial interface can either use the DHCI (DECT host controller interface) protocol or function as an AT modem interface.
In either case, the baud rate can be selected by the user.

OUR OFFER

We can carry out the following for you:

Custom Development and Adaptation

We design and develop DECT systems for predominantly data-oriented or combined voice/data communications. First and foremost, we strive to support our partners in introducing their own DECT products.

Licensing

You will be able to use our DECT hardware and software as a basis for further development or for speedy product introduction. Existing hardware and software solutions may be licensed as finished products.

Prototyping and Small-Batch Manufacture

In collaboration with our partners, we will also build prototypes and carry out low-volume production runs.

Consultancy, Measurement, System Concepts

We will support you in developing or introducing DECT radio technologies, for example by performing simulations or measurements in the target environment. In close consultation with you, we will develop product specifications, system concepts, network topologies and new services or applications.

FOR MORE INFORMATIONS

WWW.DECT-INFO.COM

Fraunhofer Institute for
Integrated Circuits IIS

Executive Director
Prof. Dr.-Ing. Albert Heuberger

Am Wolfsmantel 33
91058 Erlangen, Germany
Phone +49 9131 776-0
Fax +49 9131 776-999
info@iis.fraunhofer.de

Contact
Department Communication Networks
Nordostpark 93
90411 Nürnberg, Germany
Dipl.-Ing. (FH) Dipl.-Wirt.Ing. (FH) Karin Loidl
Phone: +49 911 58061-9413
Fax +49 911 58061-9499
dect-info@iis.fraunhofer.de

www.iis.fraunhofer.de