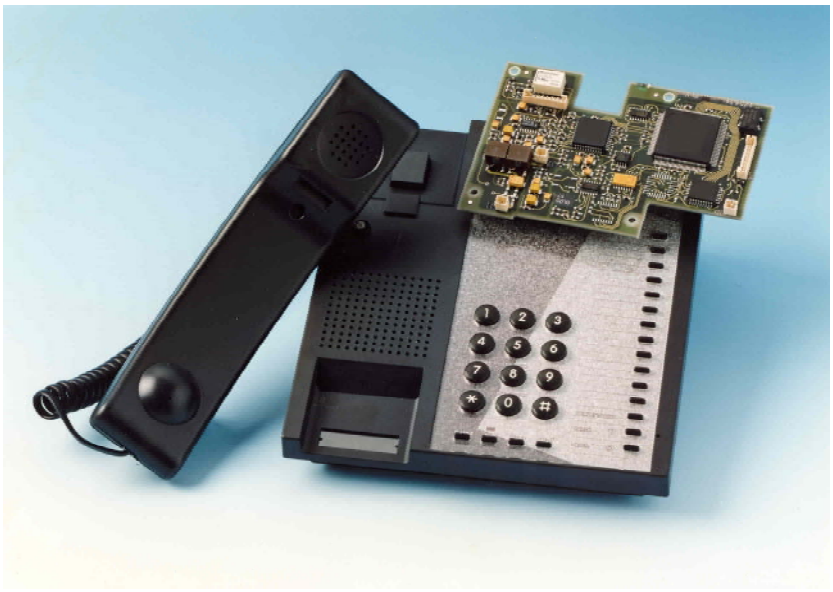
SEU-8400
PSTN Secure Phone



- world-wide, eavesdropping-secure, voice communication
- exceptional voice quality and voice recognition
- modern feature telephone with inconspicuous design
- easy installation and use

Product Overview

The SEU-8400 *Secure Phone* from ALBRECHT is a conventional modern feature phone having an additional voice ciphering function. The built-in ciphering function makes possible eaves-dropping- and spoofing-secure voice communication.

Deployment of ALBRECHT's ciphering algorithm guarantees exceptionally true-to-life reproduction and thus assured speaker recognition. This system, also proven in radio applications, offers extremely high security.

Because of the inconspicuous installation of the SEU ciphering module in a conventional telephone, the Secure Phone cannot be distinguished externally from an ordinary modern feature phone. The standard functions of the telephone are not impaired by the built-in ciphering module.

Operation of the ciphering function takes place using the telephone pushbuttons. The ciphering key is quickly and easily changed by an authorised user. The standard design requires no additional key entry unit.

The state of the connection state is signalled optically and acoustically when using the ciphering function.

Area of Application

The *Secure Phone* was developed by ALBRECHT for a clientele interested in adding an additional level of security to already existing security equipment and who, in addition to eavesdropping-secure voice communication, attach importance to a telephone which is as inconspicuous as possible. The SEU-8400 *Secure Phone* looks like a conventional modern feature phone, yet offers all the important functions of a secure voice communication system. The *Secure Phone* is delivered as a desktop model or as a portable unit in an attaché case equipped with conventional international adapters. This allows secure communications from any available connection. Electronic monitoring devices installed in assigned hotel or conference rooms by third parties can be easily bypassed using this feature e.g., simply by going to another room.

Technology

ALBRECHT's years of experience with wireless communication systems, including aviation applications, has made possible the development of an SEU voice ciphering module for high-security voice-radio communication. The result is the application of the most modern of technologies in the area of digital signal processing.

Telephone-specific extensions such as echo compensation, adaptive line equalisation and link set-up were implemented for use in the SEU module of *Secure Phone*. These extensions allow using the SEU module in international telephone links.

For applications in telephone communications, the SEU module must be connected to the telephone line being used. A built-in, internal solution to accomplish this has been chosen for the ALBRECHT *Secure Phone*. The ciphering module is inserted in the telephone signal path: In the transmitting direction, it is between the microphone and voice circuitry; in the reception direction, it is between the voice circuitry and handset (Fig. 1).
The ciphering process used in the *Secure Phone* is proprietary and internationally patented. It offers extremely high security against attacks.

The method of securing voice communication is realised by digital signal processing. The ciphered signal, however, is not a data signal which can be received and monitored by unauthorised persons. In reality it is a noise signal, where no spectral part of the original signal is available. Attempts at analysis and brute-force attacks simply cannot be carried out using currently available techniques.

The system used requires signal-distortion compensation along the transmission path using an equaliser at the receiver. The equaliser is configured during link set-up using a training sequence along the transmission channel.
In addition to equalisation, synchronisation of transmitter and receiver places high demands on digital signal processing. The system used in the *Secure Phone* exceeds the synchronisation precision employed for classic digital ciphering techniques.

The user can select a key from a combination out of several million numbers. A key change can be carried out by an authorised user using two push-buttons and the display. Precautions for securing entered keys are an essential part of the module.

Security

The high security of the ciphering techniques implemented is based on the combination of highly complex signal processing, coupled with state-of-the-art ciphering algorithms, such as IDEA, DES and AES.

Technical Data — *SEU-8400 Secure Phone*

Voice transmission

-	Signal delay in cipher operation:	30 ms (end to end)
-	Communication type:	full duplex
-	Required bandwidth:	300 to 3000 Hz
-	Adaptive channel equaliser	automatic compensation of line distortion

Applications

- Voice ciphering using the analogue telephone network
- Operation along the public telephone network or extension stations
- Operation over international lines
- Operation over satellite paths

Ciphering

-	Key Programming:	Locally or via key loading device KPU-8200
-	Algorithm:	IDEA, DES, AES
-	Key length:	up to 256
-	Key exchange:	Encrypted key exchange between station A and B after authentication procedure
-	Key input:	Manually or remote via KPU-8200 Key Programming Unit
-	Ciphered output:	Spread Spectrum noise signal without any structure. Equally distributed over the entire bandwidth
-	Synchronisation time:	8 to 10 sec., depends on the channel condition
-	Unit Status:	Optical and acoustic indicators of the unit status

Power supply

-	Mains supply:	90 to 260 VAC, 50 to 60 Hz
-	Power consumption:	1 W
-	NiCad Power Supply (opt.):	Internal charger. Autonomy: 8 hours

Mechanical data

-	Desk-top model:	180 x 210 x 070 mm
-	Attaché model:	460 x 320 x 100 mm, weight approx. 4.5 kg

Environmental requirements

-	Operating temperature:	-20 to 60 °C
-	Storage temperature:	-40 to 85 °C
-	Relative humidity:	95% /50°C)
-	EMC:	EN-55022, EN-50081/82
-	Safety:	EN-1000-4

Interfaces

-	Telephone:	RJ-45
-	Handset:	RJ-11
-	Telephone cable:	RJ-11 to RJ-11
	External key entry:	RJ-45 (Option)

Telephone functions

- Pushbutton telephone
- Redial
- Alphanumeric display
- Telephone number memory
- Hands-free speaker phone
- Pulse or tone selection
- Clear / cipher mode