

micom Modem & Vocoder

The most reliable solution for voice, data, and email gateway communications over HF



Advanced technology digital unit comprising a single-tone high-speed standardized modem, patented digital-voice vocoder, encryption for voice and data, email, and internet-gateway

Micom Vocoder & Advanced AES Digital Encryption option

The Vocoder unit is a state of the art advanced technology unit offering supreme digital voice quality over radio communications, with patented emergency robust voice message, and AES* digital encryption (*optional).

Designed to solve the traditional voice quality problem of radio communication - especially in HF-SSB links, The Micom Vocoder offers superb features, reducing background noises and providing crystal clear voice communication over every HF, VHF and UHF radio.

The Micom Vocoder also offers a patented Emergency Digital Voice message, which resembles to a "voice SMS", and a high standard digital voice encryption option, using AES (Advanced Encryption Standard) algorithm. This feature provides a very robust voice link, capable of penetrating through highly distorted negative SNR fading channels.

The Micom Vocoder unit is to be used over HF links at 1200 bps rates on the Mixed Multi-Band Excitation Linear Predictive Coding (MMBE-LPC).

The Micom Vocoder unit provides users with essential benefits and features:

Operating the unit is always fast and simple:

- The unit is an add-on device, and can be connected to any radio as an accessory
- The Micom Vocoder is available for every HF, VHF and UHF radio.

Voice is always crystal clear:

- Digital-Voice provides users with best quality voice traffic.
- Robust link - even through difficult multipath fading channels of negative SNR in which plain voice fails.

Uses Most Advanced Technology:

- Powered by advanced, extremely powerful DSP + CPU platform.
- Implementing the most powerful, recently developed, state-of-art DSP algorithms.

Built-in scalability:

- Upgrading to future technologies is easily done due to open architecture, which allows incorporating tailor-made applications by user.

AES Encryption (option):

- High Standard commercial encryption capability performed by the new AES algorithm, chosen by NIST.
- Enables Emergency Digital Voice message (patented) - the voice version of SMS.

High-speed single-tone data modem with micom-net E-mail gateway over HF software package and AES data encryption option

The 4800bps Modem is a significant evolutionary step towards eliminating the need to any particular familiarity with the HF channel. The embedded E-mail gateway software is user-friendly application for commercial PC, which guarantees a seamless end-to-end data transfer over HF-SSB, from one HF user's PC to another. It also connects HF user's PC to non-HF Internet-user's PC through the Internet in a transparent manner. Any type of computer file may be transferred between HF users and non-HF users without affecting its content. Files are sent as an attachment to the E-mail message.

Integration with ALE - When combined with Micom ALE, users do not need any familiarity with the HF channel. The computer handles all ALE operating procedures such as: The HF link is established using the optimal frequency. In cases where the present HF link becomes degraded during message transfer, the computer automatically stops transmission and establishes a new link on a better HF channel. Message transmission is resumed from the point where it was stopped, providing

fully automatic E-mail over HF and Internet. The message is sent and then the link is disconnected. Any user can easily transmit E-mail and files without having to be familiar with HF radio and ALE operation.

Internet Mail Server – The Modem has the capability to serve as an E-mail Internet mail server between HF-users and Internet users. This feature enables bi-directional communication between field Micom HF-users that don't have conventional Internet connection, and any other conventional Internet users.

The configuration of the Internet mail server station and the field-station is identical, and includes:

- MicomRadio with ALE, the high-speed modem, and PC with the MicomNet software.
- Mail from field station to Internet subscriber: The user edits and sends Email with the MicomNet. The mail reaches the Internet mail server station, and is automatically forwarded to the Internet address through

the ISP (Internet Service Provider).

- Mail from Internet subscriber to field station: each field station has an Internet address. The Internet subscriber sends email to that address. This email reaches the Internet mail server station. From here there are two modes of distributing the mail to the field stations:
 - Automatic mode:** Upon receiving the mail, the Internet mail server immediately forwards it to the target field station.
 - Polling mode:** The Internet mail server stores the mail. When the field station sends an inquiry message, the stored mail will be forwarded, to that field station.
- The MicomNet interfaces to standard Internet SMTP/POP3 and TCP/IP protocols. The MicomNet connects to the ISP through LAN or dial up.

Embedded information security - Security is guaranteed to all messages and files with optional AES encryption algorithm. The encryptions reliability, transforms the HF channels into a transparent yet secure medium for data transfer applications,

The high-speed data-modem with micom-net E-mail gateway over HF software package integrated with vocoder, and FVN 522 I voice and data AES encryption option

4-systems-in-1-unit: Micom Vocoder, Modem, E-mail Gateway over HF, and AES encryption for voice & data messages.

The unit integrates the VOCODER, high speed DATA-MODEM, Micom-Net E-mail Gateway over HF software package, and the voice and data AES Encryption option, all four features in a single box. This unit is an add-on device, which can be connected to any Micom ALE radio, as an external unit or can be embedded in the radio.

The unit includes all the features and benefits of each one of the four products as described above separately, Micom Vocoder, High-Speed Data MODEM, Micom-Net E-mail Gateway over HF software package, and AES Encryption for voice and data.

This unit support robust digital voice quality, E-mail messages, files transmission, and emergency voice messages over HF and non-HF conventional Internet-users, in a transparent manner, without any need for familiarity with the HF channel or ALE process. Just dial the number and the message (voice, E-mail, files) will arrive to its destinations automatically.

previously possible only by using fixed lines or satellite channels.

Automatic Data Compression – significantly reduces transmission time. Compression increases data-rate up to 48,000bps. Actual rate may vary, depending on the data contents of specific file.

The Modem technology, with gateway to Internet/ intranet, provides the link speed and robustness. At large variety of User's Data-Rates (75, 150, 300, 600, 1200, 2400, 4800bps without data compression, and up to 48,000bps with the embedded data compression software), the modem provides

optimal flexibility, in adapting the modem data rate to the changing conditions of the channels. The lowest data rates ensure data transfer even over highly distorted links, employing its capability to penetrate through negative SNR multipath fading wireless channels. The modem automatically tracks the channel conditions and dynamically chooses and modifies, if necessary, to the best data-rate, interleaver type, and the best channel radio frequency to transmit. The receiving side automatically detects the data-rate and all other parameters, and identifies the data in a transparent manner to the user.

A powerful adaptive equalizer implemented on advanced DSP platform eliminates the effects of multipath (multi-reflection reception) wireless channel, and the effects of the radio's RF stages imperfections. Combined with unique adaptation methods for tracking fast changing multi-ray fading channels, it is guaranteed that channel distortions such as inter-symbol interference are eliminated. Additional performance improvement is achieved by means of a powerful soft decision convolutional error correction coding (FEC) integrated with a powerful block interleaver, which can overcome signal disappearance for up to 4.8 seconds.

The Modem provides users with essential features and benefits:

- Transfer data over HF, without any need for familiarity with HF radio.
- Transfer data to multiple destinations.
- Transfer any computer file as an attachment.
- Transfer text messages using a built-in editor.
- Print messages.
- MS-Windows application.
- Automatic data compression.
- High-speed data rate: Up to 2400bps coded, and 4800bps uncoded without data compression, and up to 48,000bps with the embedded data compression software.
- Adaptive ARQ communication protocol verifying proper data transfer.
- Integrated with ALE for optimal frequency selection.
- Operates with all Micom radios.
- Operating the unit is always fast and simple:
 - The unit is an add-on device, and can be connected to any Micom ALE radio as an accessory.
- High-level Encryption option. (Export license may be required for some countries):
 - High Standard commercial encryption capability performed by the new AES algorithm, chosen by NIST.
- Using Most Advanced Technology ensures E-mail & data transfer even under harsh conditions:
 - Powered by advanced extremely powerful DSP + CPU platform.
 - Enables implementing the most powerful, recently developed, state-of-art DSP algorithms.
 - Embedded Modem technology
- fulfilling the demanding standards MIL-STD-188-110A & 110B section 5.3.2, and STANAG-4539 Annex-B sections 2, and 3. based on Well known internationally accepted standards.
 - Allows raw data transmission for new user applications.
 - Large variety of user's data-rates (detected automatically) provide great flexibility in adapting the modem to changing channel conditions, enabling data transfer even over highly distorted RF low-frequency communication link.
- Built-in scalability:
 - Upgrading to future technologies is easily done due to open architecture, which allows in incorporating tailor-made applications by user.

188-141
810FABZ9QCC1635
15,80,90

Specifications:

| | FRN8528: Vocoder Digital Audio Quality Enhancer FVN5228 AES* Encryption | FRN8526: 4800bps MODEM with E-mail/Internet gateway FVN5229 AES* Encryption | FRN8527: Integrated 4800bps Modem with E-mail/Internet gateway, Vocoder, and FVN5230 voice and data AES* encryption | |
|-------------------------------------|--|--|--|--|
| | | | | FRN8525 Vocoder Operation Mode |
| | | | | Data MODEM Operation Mode |
| Waveform | MIL-STD-188-110A & 110B section 5.3.2, and STANAG-4539 Annex-B sections 2, and 3 | MIL-STD-188-110A & 110B section 5.3.2, and STANAG-4539 Annex-B sections 2, and 3 | MIL-STD-188-110A & 110B section 5.3.2, and STANAG-4539 Annex-B sections 2, and 3 | MIL-STD-188-110A & 110B section 5.3.2, and STANAG-4539 Annex-B sections 2, and 3 |
| User Data-Rates With Compression | | up to 48,000bps | | up to 48,000bps |
| User Data-Rates Without Compression | Coded 1200bps EMERGENCY Mode (optional): Coded 75, 150, 300 bps | Coded: 75, 150, 300, 600, 1200, 2400 bps Uncoded: 4800bps | Coded 1200bps EMERGENCY Mode (optional): Coded 75, 150, 300 bps | Coded: 75, 150, 300, 600, 1200, 2400 bps Uncoded: 4800bps |
| Immunity to multi-ray multipath | 5 fading-rays tested (over standard performance) | 5 fading-rays tested (over standard performance) | 5 fading-rays tested (over standard performance) | 5 fading-rays tested (over standard performance) |

Interfaces:

| | | | | |
|--------------|---|--|--|--|
| Control | RS232 Asynchronous: 1,200/2,400/4,800/9,600 b/s | RS232 Asynchronous: 1,200/2,400/4,800/9,600 b/s | RS232 Asynchronous: 1,200/2,400/4,800/9,600b/s | RS232 Asynchronous: 1,200/2,400/4,800/9,600 b/s |
| Data | NA | RS232 Asynchronous: 1,200/2,400/4,800/ 9,600b/s Point to Point protocol | NA | RS232 Asynchronous: 1,200/2,400/4,800/9,600 b/s Point to Point protocol |
| Input Audio | Nominal 0 dBm (600 Ohm, balanced) | Nominal 0 dBm (600 Ohm, balanced) | Nominal 0 dBm (600 Ohm, balanced) | Nominal 0 dBm (600 Ohm, balanced) |
| Output Audio | Nominal 0 dBm (600 Ohm, balanced) | Nominal 0 dBm (600 Ohm, balanced) | Nominal 0 dBm (600 Ohm, balanced) | Nominal 0 dBm (600 Ohm, balanced) |
| Microphone | Handset H250 | NA | Handset H250 | NA |
| Speaker | 5W / 8 Ohm | NA | 5W / 8 Ohm | NA |

Environment:

| | | | | |
|-------------|-------------------|-------------------|-------------------|-------------------|
| Temperature | -30 to + 60 deg C | -30 to + 60 deg C | -30 to + 60 deg C | -30 to + 60 deg C |
| Humidity | 95% @ + 50 deg C | 95% @ + 50 deg C | 95% @ + 50 deg C | 95% @ + 50 deg C |
| Storage | -40°C to +85°C | -40°C to +85°C | -40°C to +85°C | -40°C to +85°C |

* Subject to export license

** Micom Vocoder/Modem/Encryption offered as Embedded option in MICOM3 Models

Mobat USA

1721 West Paul Dirac Dr.
Tallahassee, Florida 32310
Tel: 850 580 0420 · Fax: 850 580 2626
marketing@mobatusa.com · www.mobat.commobatmicom
best radio for worst events

This publication is issued to provide general outline information only and does not constitute a representation on behalf of the company. This publication may not be used or reproduced for any purpose other than general acquaintance with the described products and it may be changed by the company without notice.