ENEA® V42-BRICKS

Classical Compression and Error Correction modem protocols

Enea® V42-Bricks is a portable protocol stack that implements the protocols used by modem client or server devices to connect to the PSTN or ISDN.

Enea® V42-Bricks is fully compliant with ITU-T recommendations V.42 and V42bis and de facto standards MNP4 and MN P5. Enea V42-Bricks works with PSTN (Enea® ACU-Bricks) and ISDN (Enea® ISDN-Bricks) signaling as well as Enea's FAX-Bricks and ISDN Terminal Adapter architectures (AT command driven).

Enea offers drivers for modem chipsets from Conexant and Motorola. It also provides drivers for software-based modulations (V.21, V.22, V.22bis, V.32, and V.32bis) implemented by Enea® Softmodem-Bricks, as well as audio processing for PSTN signaling (DTMF, CNG, CED).

Enea V42-Bricks is based on Enea's object-oriented Netbricks architecture. Utilizing message passing for inter-entity communications, Enea V42-Bricks can process a rough synchronous byte stream or support HDLC controllers.

Enea V42-Bricks is available with interfaces to most commercial RTOSes, including AMX, Nucleus, OSE, Precise/MQX, PSOS+, RTC, VRTX, and VxWorks. Enea offers custom implementations of Enea V42-Bricks for OEMs who require an application-specific solution.

Features

Enea V42-Bricks provides the following primary entities:

- CF: Control Function
- DLM: V.42 error correction
- MNP4: MNP4 Error correction (V.42 annex A)
- DC: Data Compression according to V.42bis and MNP 5

And companion entities:

- MPH-GSTN: layer 1 driver
- DTE-INT: DTE interface using AT parser and serial port
- CC: ISDN Call Control
- ACU: PSTN Call Control
- T30: Fax Group 3
- FAXMOD: Fax group 3 convergence function

Layer 1 (PH-GSTN) functions:

- Communication with adjacent entities (SM)
- Drivers for modulations, tones and DTMF through a modem chipset or soft modem (SOFTMODEMBRICKS)
- Frame delimitation (HDLC frame)
- HDLC bit stuffing and un-stuffing
- CRC16 calculation and error detection
- Alarm reporting
- Statistics reporting
- Provisioning and re-provisioning
- Supports the following modem chipsets
  - Conexant (Rockwell): RC2324, RC9623 DP, RC144 DP, RC144 DPI, RC288 DPI, RC336 DDP/DPFL RC56 DDP/DPFL,
  - Motorola MC68356,
- Standard: V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34, V.90, ISO HDLC 3309

DLM and MNP4 functions:

- Data link error correction protocol
- V.42 Finite State Machine (FSM)
- V.42 Annex A Finite State Machine (FSM) (MNP4)
- XID parameter negotiation
- TEST command option
- SREJ option
- Statistics reporting
- Provisioning and re-provisioning
- Standards: ITU-T V.42

CF functions:

- Internal API to the upper layers
- Coordination between the modem and fax functions
- Flow control coordination
- Provisioning and re-provisioning
- Error reporting
- Standards: ITU-T V.42

DC functions:

- Data compression according to V.42bis and MNP5
- Dictionary management
- Flow control management
- Provisioning and re-provisioning
- Error reporting
- Standards: ITU-T V.42bis and de-facto MNP5

Enea V42-Bricks Software Architecture

The software is based on Enea's Netbricks architecture, which follows the ISO/CCITT X.200 model.

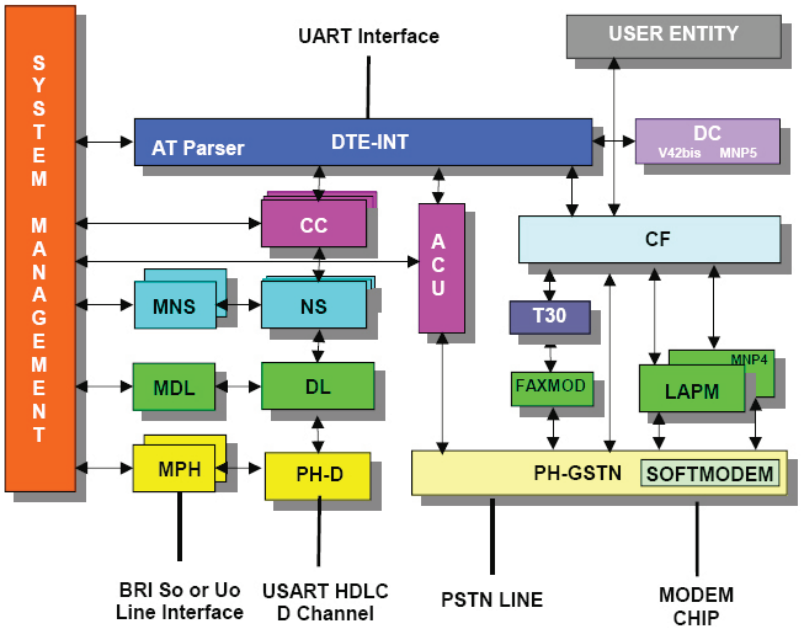
All the protocol entities are managed as isolated objects, which communicate through Datagram message passing utilizing FIFOs.

The system entities are housed in processes (one or more entities per process), which are managed by an RTOS real-time multi-tasking kernel. When the origination and destination

entities are in the same process, the message passing is handled through an internal FIFO without need for RTOS scheduling. When the two entities are in different processes, the message passing is done using RTOS message exchange management.

The figure shows the different protocol stacks and the communications between system entities. The system contains the following stacks and entities.

- System management (SM).
- Signaling stack:
  - ACU: PSTN signaling or
  - MPH-D physical layer management
  - PH-D physical HDLC D channel protocol
  - MDL data link layer management
  - DL data link protocol (LAPD)
  - MNS network signaling management
  - NS network signaling protocol
  - CC call control protocol with extension for multiple calls management
  - DTE-INT DTE interface with "AT" command set parser
- Modem and Fax protocol stack:
  - PH-GSTN Physical modem protocol,
  - LAPM and MNP4 Error correction protocol (V.42 and MNP4 (V.42 annex A))
  - CF control function
  - DC data compression (V.42bis, MNP5)
  - FAXMOD fax modem protocol
  - T30 T.30 protocol with Error Correction Mode (ECM)
  - DTE-INT DTE interface with TR29 class 2 and "AT" modem protocols



Enea V42-Bricks Client Software Architecture.