

ENEAA[®] FR-BRICKS



1

Q.922, Q.963 Frame Relay Signaling Protocols

Enea[®] FR-Bricks is a portable software package that implements the protocols used in Frame Relay endpoint equipment for both Permanent Virtual Circuits and Switched Virtual Circuits (PVC's, SVC's).

Enea[®] FR-Bricks is fully compliant with ITU-TS recommendations: Q.922, Q.933; ANSI standards: T1.606, 617, 618 and Frame Relay Forum Implementation Agreement (FRF.4).

Enea FR-Bricks is based on Enea's Netbricks architecture using object oriented design and a message passing mechanism for inter-entity communication. Enea FR-Bricks can process rough synchronous byte streams or support HDLC controller. Enea FR-Bricks can also be used in conjunction with Enea[®] ISDN-Bricks to support ISDN BRI and PRI switched access to Frame Relay Networks for both PVCs and SVCs.

Enea FR-Bricks is available with interfaces to most commercial RTOs, including AMX, Nucleus, PSOS+, RTC, VRTX, and VxWorks. Enea offers custom Enea FR-Bricks implementations for OEMs who require an application-specific solution.

Features

Enea FR-Bricks contains the following main software entities:

- PH: Physical HDLC drivers with an optional HDLC by software solution
- DL: Data Link
- LMI support
- NS: Network signaling with Frame Relay variant
- CC: Call Control with Frame Relay variant

PH implements for a synchronous full duplex bit stream:

- Frame delimitation (HDLC frame)
- HDLC bit stuffing and un-stuffing

- CRC16 calculation and error detection
- Error Rate Monitoring (Alignment and Normal)
- Provisioning and re-provisioning
- PH and Management APIs
- Supports Motorola MC683xx, PowerQUICC I and II, Infineon ESCC2/8, Munich 32, HSCX, and Zilog Z85230,
- Standard: ISO HDLC 3309

Data Link (DL) implements the following functions:

- Extended DLCI
- Forward and backward congestion notification
- Core DL
- Error correction
- Provisioning and re-provisioning
- CC and management APIs
- Standards: ITU-TS Q.922 ; ANSI T1.618

Local Management (LMI) implements the following functions:

- Status message support
- Standards: ITU-TS Q.933 Annex A; ANSI T1.617 Annex D ; Frame Relay Forum FRF1.1 Annex A

Network Signaling (NS) implements the following functions:

- Access on demand
- Q.933 syntax encoder/decoder
- Q.933 Finite State Machine
- Provisioning and re-provisioning
- CC and Management APIs
- Standards: ITU-TS Q.933, ANSI T1.617, FRF.4

Call Control (CC) implements the following functions:

- Call parameters management
- Provisioning and re-provisioning
- CC and management APIs
- Standards: ITU-TS Q.933 and ANSI T1.617

Enea FR-Bricks Software Architecture

- System management entity (SM)
- FR stack:
 - MPH physical management entity
 - PH entity:
 - HDLC interrupt service routine
 - PH entity
 - MDL data link management entity
 - DL entity
 - MNS network signaling management entity
 - NS network signaling entity
 - CC call control entity
- API:
 - API-SERVER entity

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