



NETBRICKS

X25-BRICKS

INTRODUCTION

NETBRICKS *X25-BRICKS* is a portable software package implementing the X.25 and Packet Assembly Disassembly Facility PAD protocols to be used between a Data Terminal Equipment (DTE) and a Packet Switched Data Network (PSDN), when the access is made by a dedicated circuit or by an ISDN BRI or PRI line using B or D channels.

X25-BRICKS is fully compliant with ITU-T recommendations : X.25, X.32, X.75, X.31, and ISO standards IS 7776 and IS 8208. The PAD is compliant with ITU-T recommendations X.3, X.28, X.29.

When the access is made by ISDN the following protocols are used :

- ❑ X.25 LAPB procedures on the B-channels and Q.921 LAPD procedures on the D-channel. X.25 LAP procedures are not considered here.
- ❑ X.25 packet layer procedures on B-, and D-channels.

X25-BRICKS is companion stack of ISDN-BRICKS for support of X.31 case A.

X25-BRICKS can be interface using NETBRICKS API-SERVER and optional Host X/Open "X.25 Programming Interface using XTI/XX25.

API-SERVER is compliant with ETSI ETS 300 323 and XTI/XX25 with X/Open document number P411, July 1994

X25-BRICKS architecture is based on NETBRICKS architecture using object oriented design and a message passing mechanism for inter-entity communication. *X25-BRICKS* is designed to process a rough synchronous byte stream or to support HDLC controller. Interfaces to most of commercial RTOS are provided : AMX, Nucleus, PSOS+, RTC, VRTX, WxWorks, ...

X25-BRICKS is certified ISO 8882 and ETSI NET2.

X25-BRICKS is addressed to the OEM market. Netbricks can develop any custom product based on *X25-BRICKS* technology according Customer's specifications.

FEATURES

X25-BRICKS consists of the following main software entities :

- ❑ MDL, DL : Management Data Link and Data Link,
- ❑ MX25, X25-PLP : X.25 Management and X.25 Packet Layer Protocol,
- ❑ PAD : PAD (X.3, X.28, X.29)

Data Link (DL) implements the following functions :

- ❑ Core DL LAPB and LAPD (if ISDN support),
- ❑ Support of modulo 8 and 128,
- ❑ Frame Length, window size, timer values supported at provisioning time,
- ❑ Error correction,
- ❑ Multi-Link Procedure (MLP) option,
- ❑ X.75 support,
- ❑ Data Link relay support,
- ❑ Provisioning and Re-provisioning,
- ❑ APIs,
- ❑ Standards : ITU-T X.25 1988 and ISO 7776.

X25-PLP implements the following functions :

- ❑ ITU-T and ISO timers
- ❑ Modulo 8 and 128 support,
- ❑ RNR, REG, DIAD packets support,
- ❑ D, Q, A, M bits management,
- ❑ Extensive list of optional facilities support,
- ❑ Statistics counters compliant with link MIB,
- ❑ X.25-PLP Finite State Machine,
- ❑ Provisioning and Re-provisioning,
- ❑ APIs :
 - ◆ OSI Network services ITU-T X.213,
 - ◆ X.25 oriented API.
- ❑ Standards : ITU-T X.25, ISO IS8208.

PAD implements the following functions :

- ❑ Management of call parameters,
- ❑ Provisioning and Re-provisioning,
- ❑ DTE-INT entity internal interface,
- ❑ Standards : ITU-TS X.3, X.28, X.29.

X25-BRICKS companion stacks :

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,
- ❑ Support of :

- ◆ Infineon IPAC, ESCC2, ESCC8, Munich-32, HSCX,
- ◆ Motorola MC683xx, PowerQUICC I and II
- ◆ Zilog Z85230, Z8530.
- Standard : ISO HDLC 3309

PAD is a set of functions implementing :

- assembly of characters into packets;
- disassembly of the user data field of packets;
- handling of virtual call set-up and clearing, resetting and interrupt procedures;
- generation of service signals;
- a mechanism for forwarding packets when the proper conditions exist, e.g., when a packet is full or an idle timer expires;
- a mechanism for transmitting data characters, including start, stop and parity elements as appropriate to the start-stop mode DTE;
- a mechanism for handling a break signal from the start-stop mode DTE;
- editing of PAD command signals;
- a mechanism for setting and reading the current value of PAD parameters.
- a mechanism for the selection of a standard profile,
- Provisioning and re-provisioning.

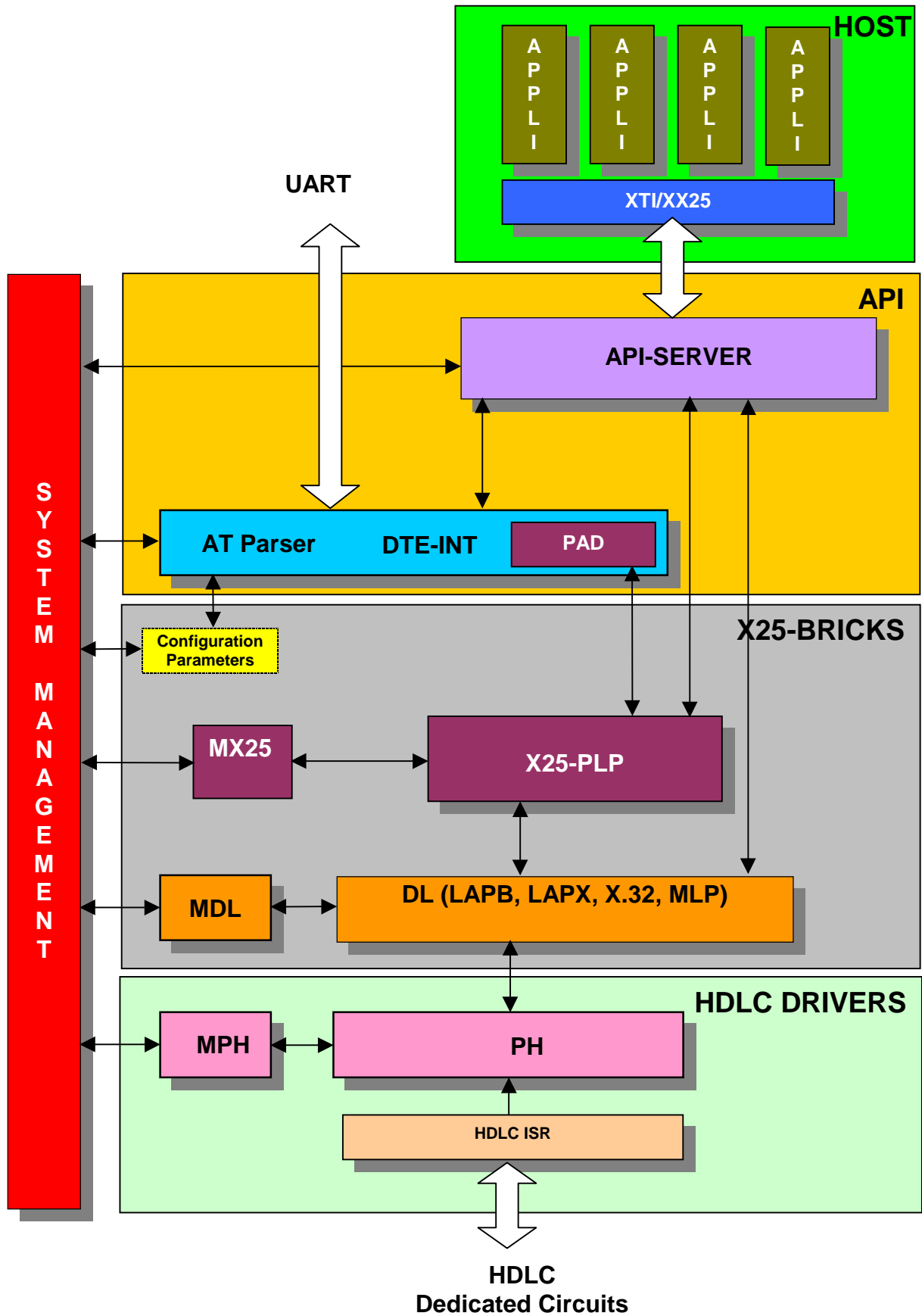
ISDN signaling (described in ISDN-BRICKS data sheet).

API-SERVER (described in API-SERVER data sheet)

XTI/XX25 implements the following functions :

- Reset,
- D Bit,
- Explicit acknowledgment of expedited data,
- Setting of D bit during connection phase for negotiation,
- X.32 ID procedure,
- Data Link LAPB support,
- X25 Facilities :
 - ◆ Packet size,
 - ◆ Window size,
 - ◆ Throughput class negotiation,
 - ◆ Closed User Group,
 - ◆ CUG with outgoing access,
 - ◆ Bilateral CUG,
 - ◆ Fast select,
 - ◆ Reverse charging,
 - ◆ Local and remote non X.25 facilities.

- ❑ System management entity SM.
- ❑ HDLC drivers :
 - ❑ MPH Physical management entity (line interface)
 - ❑ PH entity (HDLC) :
 - ◆ HDLC Interrupt Service Routine.
 - ◆ PH entity
- ❑ *X25-BRICKS* stack :
 - ❑ MDL Data Link Management entity
 - ❑ DL entity (LAPB and LAPD)
 - ❑ MX25 X.25 Management entity
 - ❑ X25-PLP X.25 Packet layer Protocol entity
 - ❑ PAD Packet Assembly Disassembly entity
- ❑ *ISDN-BRICKS* stack :
 - ❑ CC Call Control
 - ❑ MNS Network Signaling Management
 - ❑ NS Network Signaling
- ❑ API :
 - ❑ API-SERVER entity
 - ❑ DTE-INT entity (AT commands and PAD)
 - ❑ XTI/XX25 XTI support



X25-BRICKS/ISDN-BRICKS SOFTWARE ARCHITECTURE

