

# IXF3461 Slot Switching Dual-Channel T1/E1/J1 LIU and Framer

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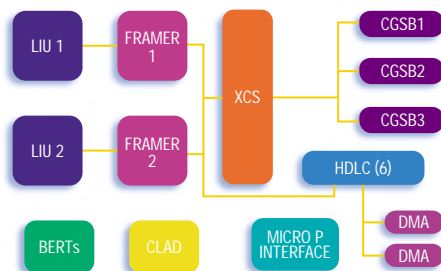
## Product Overview

The IXF3461 is a flexible, dual-channel T1/E1/J1 Line Interface Unit (LIU) and framer. It is the only combination LIU and framer to feature a fully integrated cross connect switch (XCS) designed for use in 1.544Mbps applications (T1 or J1), or in 2.048Mbps applications (E1). The XCS can interchange both data and signaling in any time slot on any port (system or line) with any other time slot on any other port. The highly integrated IXF3461 solution is ideal for the convergence of voice and data communications. And it provides the performance, robustness, and flexibility to help speed deployment and increase the integrity and availability of the network.

The Simplified Slot Switching (SSS) features of the IXF3461 address developers' complex timing issues and faster-design requirements. The product handles critical cross connect timing internally, so that slot switching with the IXF3461 can help reduce design complexity, shorten testing time, and enable quick delivery of reliable systems to market.

## Flexibility and Control

In addition to a flexible and programmable system interface, the slot switching capability of the IXF3461 provides direct control of time slot assignment on the system bus. The IXF3461 works from a single reference clock input and generates all required T1/E1 clocks internally. It is available in a 160-pin MQFP or PBGA package with 3.3V CMOS technology, enabling you to use T1/E1/J1 equipment to efficiently build low-cost and low-power systems.



In addition, you can combine the XCS with a PCM highway system interface (CGSB) to implement a full non-blocking, 128 x 128-channel, cross connect function between two independent IXF3461 LIUs.



## Carrier Access Support

For carriers, network availability has growing importance. The IXF3461 helps meet this need by incorporating innovations such as a flexible on-chip BERT and programmable pattern generator/detection testers, diagnostic and configuration monitoring features, and elastic buffer pointer position indicators for calculating delays. In addition to standard network line, payload, and time slot loopbacks, the IXF3461 provides corresponding loopbacks to the system side. These loopbacks, when used with the embedded BERT and programmable pattern generator/detection testers, provide both in-service and out-of-service data path fault detection and isolation capabilities. Integrated alarm signaling also helps reduce system processor loading.

## Robust, Rapid Deployment

The innovative IXF3461 is a fully switchable LIU and framer, allowing you to design a single board to support T1, E1, and J1 applications with no receive-loss compromise or external component changes. You can convert from T1 to E1 with a single IXF3461. An integrated clock adapter simplifies design and keeps component count to a minimum. In addition, each LIU port can be independently controlled, enabling you to convert from one standard interface to another on a single chip. Six HDLC controllers and its time slot switching capabilities make the IXF3461 ideal for GR303/V5.2 applications with voice and data integration.

Intel also offers an IXF3461 Evaluation Kit to help simplify otherwise complex system design. The kit includes a four-port reference design complete-protection circuitry, a comprehensive hardware API, and a GUI. Pulse Template Matching software facilitates your design efforts and ensures design conformance to stringent specifications. The Evaluation Kit also includes all design files to help speed product development and introduction to market.

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## Features

- Local switching of DS0s/DS1s
- Counters and extensive bit error rate testing
- T1 or E1 switchability
- Intel® technology and performance
- Flexible backplane
- Includes GUI, Application Program Interface (API), and device drivers
- Integrated DMA controller on HDLC
- Pulse Template Matching software
- Three CGSB highway system interfaces
- Six independently configurable HDLC controllers
- Extensive flexibility in interrupt operation
- Support for either Intel- or Motorola-compatible microprocessor bus interfaces with either an 8-bit or 16-bit data path

## Benefits

- Off-loads system resources
- Provides convenient performance monitoring
- Eliminates the need for external component changes
- Facilitates robust field operation
- Supports non-multiplexed and multiplexed bit and byte replication operations
- Accelerates system development
- Promotes fast data transfer
- Accelerates transceiver design and circuit deployment, shortening time-to-revenue
- Offers compatibility with MVIP/ST bus, HMVIP, IOM/GCI, and CHI bus
- Supports ISDN PRI, GR-303, V5.1, and V5.2 applications
- Optimizes software control
- Minimizes latency
- Maximizes programmability
- Provides flexible design options

## Acronyms

BERT: Bit Error Rate Test  
CGSB: Customizable Generic Serial Bus  
DMA: Direct Memory Access  
DSLAM: Digital Subscriber Line Access Multiplexer  
FDL: Facility Data Link  
FIFO: First In, First Out data buffer  
GUI: Graphical User Interface  
HDLC: High-level Data Link Control (protocol)  
JA: Jitter Attenuator  
LIU: Line Interface Unit (transceiver)  
PCM: Pulse Code Modulation  
RAS: Remote Access Server  
SSS: Simplified Slot Switching  
XCS: Cross Connect Switch

## Key Applications

- Integrated access devices (IAD), LAN/WAN bridge/router
- FRAD, CSU/DSU, and base stations
- DLC, HDSL T1 extensions (and pair gain systems)
- DSLAM with local switching
- PBXs and RAS
- Microwave radio systems

## Support Products

- The IXF3461 Evaluation Kit with four-port reference design, design files, and User Guide
- GUI, programmer interface, and device drivers
- IXF3461 Datasheet
- Long-haul Frequently Asked Questions (FAQs)
- Application Notes 129, 130, and 142

## A New Approach to Development: Intel® Internet Exchange™ Architecture

Intel is addressing today's market challenges with a range of new solutions in a cohesive set of standard building blocks for network systems—the Intel® Internet Exchange™ (IX) architecture.

The unique silicon and software components that comprise the Intel® IX architecture facilitate your development of relevant solution platforms—with scalable performance, flexible handling of multiple protocols, and world-class

development tools. Its growing suite of silicon and software building blocks were designed to offer you:

- Cost effectiveness
- Development efficiencies
- Seamless interoperability

The Intel IX architecture is helping to provide a comprehensive solution now *and* for the future of your business.



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