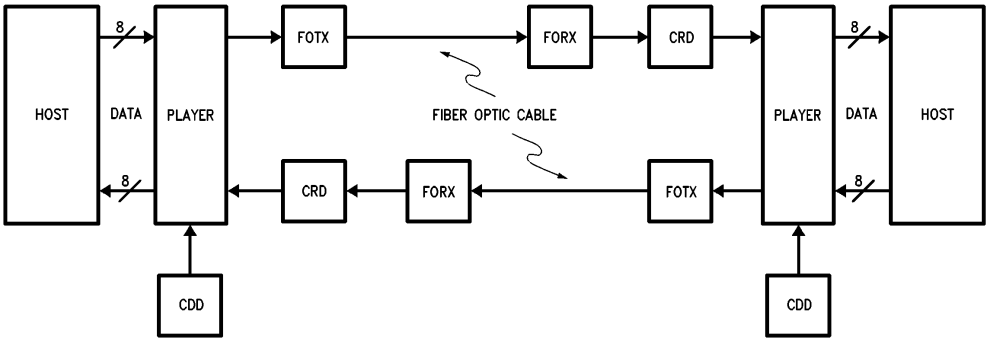
High Speed, Point to Point, Fiber, Data Communication

National Semiconductor
System Brief 107
August 1990



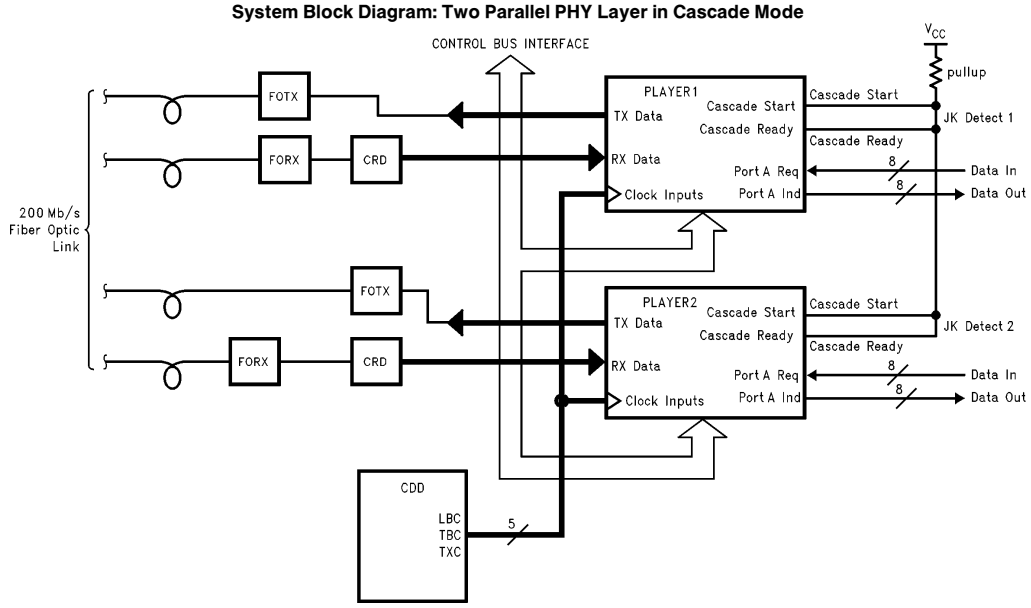
TL/F/10857–1

Serial Point-to-Point Data Communications

SYSTEM DESCRIPTION

Point-to-Point links are needed in any application where data throughput is the limiting factor to system performance. They can be installed between a CPU and disk controller to speed up information storage and retrieval times or the display capabilities of a graphics workstation can be combined with a supercomputer to achieve visualization for data intensive simulation. Point-to-Point links can also be used in a high-speed networking backbone where separate FDDI rings are connected with a fiber link to provide bridging without loss of performance. Fiber optics can be used to extend SCSI or IPI transmissions. High bandwidth, greater than 100 Mb/s, point-to-point applications can use parallel FDDI PHY layers. High bandwidth point-to-point solutions prove parallel FDDI PHY layers to be cost effective, simple systems with minimal logic, and requiring only standard FDDI fiber optic transceivers (which operating at 125 MHz, are less expensive than a GHz laser).

System Block Diagram: Two Parallel PHY Layer in Cascade Mode



TL/F/10857–2

CDD™, CRD™ and PLAYER™ are trademarks of National Semiconductor Corporation.

©1995 National Semiconductor Corporation TL/F/10857

RRD-B30M105/Printed in U. S. A.

DESIGN CHALLENGES

1. Need for high bandwidth, high throughput, and high reliability.
2. Need to interface with a variety of system applications and maintain security and reliability.

KEY COMPONENTS

1. Clock Distribution Device (CDD™) provides the clocks needed for the PLAYER™ device and the host if needed. It provides 125 MHz differential ECL signals from an inexpensive 12.5 MHz crystal.
2. Physical Layer Controller Device (PLAYER™) performs the encoding and serialization of transmitted data, and deserialization and decoding of received data. It is compatible with 4B/5B and NRZI transmission code, and supports both single and dual attach station configurations.
3. Clock Recovery Device (CRD™) extracts the clock signal from incoming data and passes a resynchronized equivalent and a recovered clock signal to the PLAYER Device.
4. Transceiver provides electrical to light conversions.

BILL OF MATERIAL

Function	Description	NSC	Other Mfg.	Qty
Decoding	PLAYER	DP83251/55		2
Clock Recovery	CRD	DP83231		2
Clock Distribution	CDD	DP83241		1
Transceiver	FOTX FORX		 ✓	2 2
AND Function	GAL	GAL16V8A		1–8

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

National Semiconductor Corporation
1111 West Bardin Road
Arlington, TX 76017
Tel: 1(800) 272-9959
Fax: 1(800) 737-7018

National Semiconductor Europe
Fax: (+49) 0-180-530 85 86
Email: cnjwge@tevm2.nsc.com
Deutsch Tel: (+49) 0-180-530 85 85
English Tel: (+49) 0-180-532 78 32
Français Tel: (+49) 0-180-532 93 58
Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: (852) 2737-1600
Fax: (852) 2736-9960

National Semiconductor Japan Ltd.
Tel: 81-043-299-2309
Fax: 81-043-299-2408

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.