





OVERVIEW

The dtFLYLink is a fiber channel data streaming interface, allowing easy connection between several different platforms for high-speed data exchange.

Developed having the trio *quality, flexibility, performance* in mind, it was designed to provide **high reliability, high bandwidth** and low overhead data transfer while maintaining a simple design and easy configuration.

One of the Link's main goals is to provide the host system designer with **easy integration** modules so contributing for the time-to-market goals by relieving from concerns about the details of data protocols.

The Link can handle transfer rates of up to **4.25 Gbps** per channel of data over a fiber with minimal host CPU loading, low latency and overhead.

The Link is supplied in two board formats (mezzanine and 4-lane PCI Express®) and is mechanically and electrically compatible with some well known standard protocols such as SATA, PCI Express®, Xilinx Aurora and CERN's S-Link 64.

By allowing different combinations between them, they widen the application spectrum. Also, as they are built on an FPGA core, it is possible to add configurable hardware add-ons **maximizing its flexibility**.

And because sometimes it is important going a little deeper, the link can also be supplied in a **'developer's version'**, allowing more configuration.

Software drivers are available for both Linux and Windows, 32 and 64 bit environments.

Built-in monitoring and control logic is capable of handling the aspects concerning the link, avoiding data overflow or under run, issuing alerts in case of any serious problem.



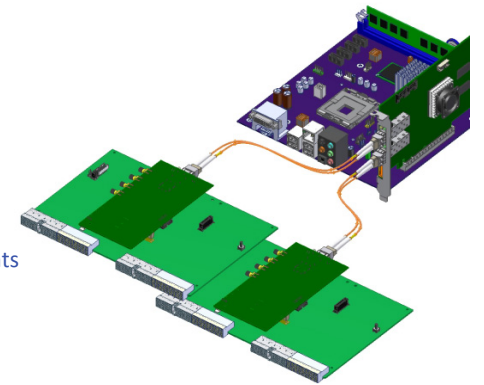
MAIN FEATURES

- 1 or 2 full-duplex autonegotiating channels
- Up to 4.25Gbps (full duplex) per channel
- Mezzanine or PCI Express® Cards
- Compatible with CMC, Aurora and S-Link 64 protocols
- Built-in hardware test and diagnostics
- Low power consumption
- Optical front panel connections (SFP transceivers)
- High flexibility FPGA based architecture (can be used as a full product or development system)



TYPICAL APPLICATIONS

- High-speed data streaming
- Instrumentation
- Medical Imaging
- Physics applications
- Hardware testing
- IP Development
- Data transfer in electrically hostile environments



ORDERING INFORMATION

dtFLYLink **M** (Mezzanine Card)

dtFLYLink **M-DEV** (Mezzanine Card - Developer's Version)

dtFLYLink **P** (PCI Express® Card)

dtFLYLink **P-DEV** (PCI Express® Card - Developer's Version)

dtFLY Link M

The dtFLYLink M is a mezzanine board designed to provide the host the capability of exchanging data with another system, either by linking to another dtFLYLink M board or by linking to a dtFLYLink P board and thereby connecting to a PCI Express® bus.

This card's **high reliability** and **simple integration** relieves the host system's designer from the burden of concerning about the details of data streaming, especially in systems that have very **high-performance requirements**.

Based on a Xilinx® Virtex4™ FPGA, the dtFLYLink exchanges data at a rate speed of up to 4.25Gbps full-duplex. The FPGA core grants the system the **maximum flexibility** as it can also accommodate configurable hardware add-ons.

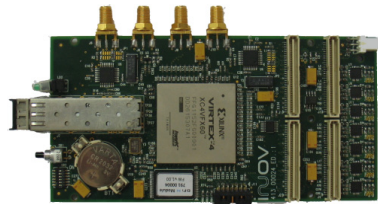
The link is based on an autonegotiating channel, which means that the host system doesn't need any kind of initialization or any other form of link control.



The card is prepared to be plugged to any host compliant with CERN's S-Link64 standard via a set of two CMC connectors. A second set of CMC connectors provides a general-purpose single-ended 64-bit interface (or differential 32-bit). These two interfaces can be simultaneous run as they use independent FPGA resources.

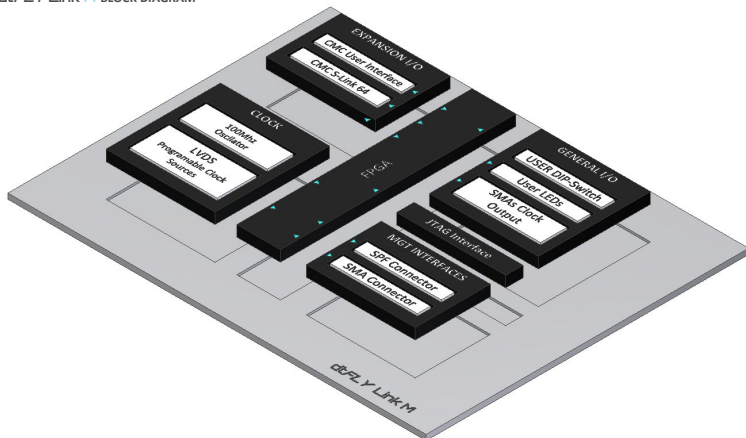
The board has **built-in self-monitorization** logic, which includes link status and basic board's parameters.

A set of **configurable debug interfaces** (JTAG®, DIP switches, LEDs, user-defined I/Os) as well as high-speed differential clock input/output provides the user with a simple and quick debug.



dtFLYLink M MEZZANINE CARD

dtFLYLink M BLOCK DIAGRAM



DATA FIBRE INTERFACE

All brand names or product names mentioned are trademarks of their respective holders. This product includes technical information created and made available by CERN.

dtFLY Link P



The dtFLYLink P is a PCI Express® card designed to provide the host the capability of exchanging data with another system by linking to one or two dtFLYLink M boards.

This card's **high reliability** relieves the host system's designer from the burden of concerning about the details of data streaming. It is **plug-and-play** and runs in both Linux and Windows, 32 or 64-bit environments.

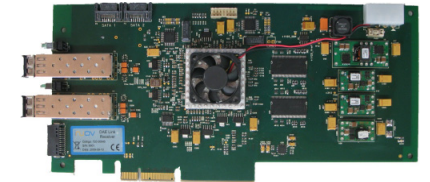
Based on a Xilinx® Virtex4™ FPGA, the dtFLYLink exchanges data at a rate speed of up to 4.25Gbps full-duplex per channel. The FPGA core grants the system the **maximum flexibility** as it can also accommodate configurable hardware add-ons.

The link is based on an autonegotiating channel, which means that the host system doesn't need any kind of initialization or any other form of link control.

The dtFLYLink P board has a 4-lane PCIe v1.1 bus interface as its main link. The board is also prepared to act as an offload engine by taking advantage of two PowerPC® cores inside the FPGA. Two SATA interfaces for external HDD storage and 128MB DDR RAM complete the tools needed for an implementation of this functionality.

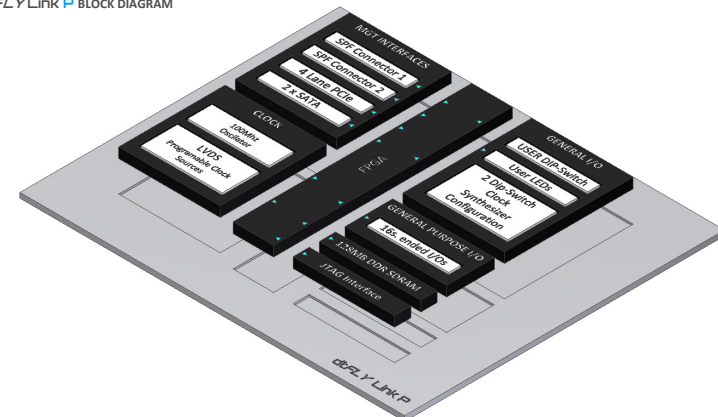
The board has **built-in self-monitorization** logic, which includes link status and basic board's parameters.

A set of **configurable debug interfaces** (JTAG®, DIP switches, LEDs, user-defined I/Os) as well as high-speed differential clock input/output provides the user with a simple and quick debug.



dtFLYLink P PCI-e® CARD

dtFLYLink P BLOCK DIAGRAM





dtFLY Link M MAIN SPECIFICATIONS

PRELIMINARY

OPTIC LINK DATA RATES	4.25Gbps autonegotiating
DATA TRANSFER RATE	Up to 380 MBps payload data (full-duplex)
FIBRE OPTIC CABLES	50/125 LC-LC
PROTOCOL SUPPORT	Aurora
INTERFACES	One SFP optical One S-Link64 One 64bit user-definable interface One MGT routed to SMA connectors Tx/Rx
CONNECTORS	One optical multimode SFP connectors, LC-style small form factor SMA programmable low-jitter clock outputs up to 700MHz Four CMC connectors for S-Link and user interfaces
FORM FACTOR	Mezzanine
POWER REQUIREMENTS	1.5A at +3.3VDC (max)
POWER CONSUMPTION	4 W (typical)
TEMPERATURE	Operating: 0°C to +80°C
HUMIDITY	Operating: 10-90% non-condensing
PROGRAMMING / DEBUG	JTAG® interface Six user-configurable microswitches Six user-configurable LEDs Built-in self-diagnostics and monitoring
BOARD DESIGNATION	dtFLY Link M



dtFLY Link P MAIN SPECIFICATIONS

PRELIMINARY

OPTIC LINK DATA RATES	4.25Gbps autonegotiating
DATA TRANSFER RATE	Up to 760 MBps payload data (full-duplex)
FIBRE OPTIC CABLES	50/125 LC-LC
PROTOCOL SUPPORT	Aurora PCI Express® v1.1
INTERFACES	Two SFP Optical interface Two Serial ATA interfaces up to 6Gbps One 16-bit user-configurable I/O interface in the board's front panel
CONNECTORS	Two optical multimode SFP connectors, LC-style small form factor 4-lane PCI Express® edge card interface One front-panel Erni connector for user I/O interface
FORM FACTOR	Full-length PCI Express® edge card
POWER REQUIREMENTS	6A at +5VDC (max)
POWER CONSUMPTION	20 W (typical)
TEMPERATURE	Operating: 0°C to +80°C
HUMIDITY	Operating: 10-90% non-condensing
PROCESSORS	PowerPC® 405 hardware cores
MEMORY	128MB DDR SDRAM
PROGRAMMING / DEBUG	JTAG® interface Six user-configurable microswitch ¹ Six user-configurable LEDs ¹ Built-in self-diagnostics and monitoring SFP and link status LEDs 32Mb configuration PROM ²
BOARD DESIGNATION	dtFLY Link P

¹ Allows multiple IP core storage

² Configurable by user