Sensor Networking for Medical and Industrial Flat Panel Detectors

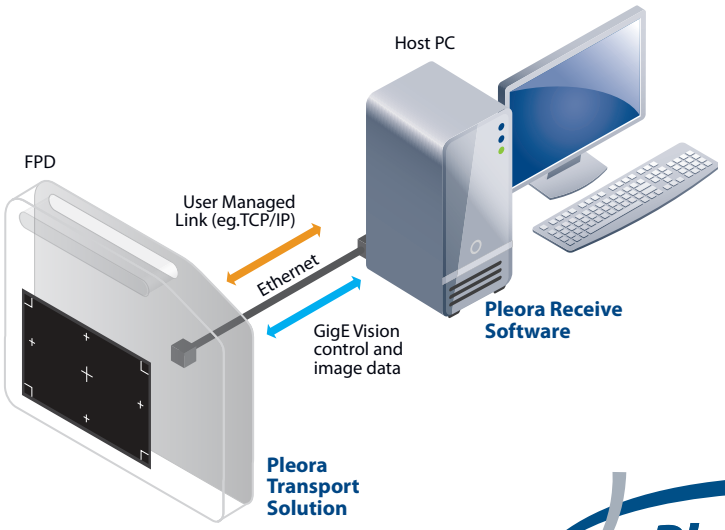
Pleora's comprehensive portfolio of sensor interface solutions help manufacturers reduce development costs, complexity, and time by providing a high-bandwidth, highly reliable end-to-end network link between flat panel detectors (FPDs) and receiving devices.

The company's real-time sensor networking expertise solves complex connectivity challenges for X-ray systems that must process, analyze, and display high-bandwidth video and data with extremely low latency. Pleora's embedded hardware, highly flexible FPGA IP core, and software-only solutions seamlessly transmit sensor data from static and dynamic FPDs to software designed to efficiently receive high-bandwidth image streams.

Pleora's market-proven sensor interfaces for FPDs have been designed into medical radiography, panoramic dental, security, and industrial inspection applications.

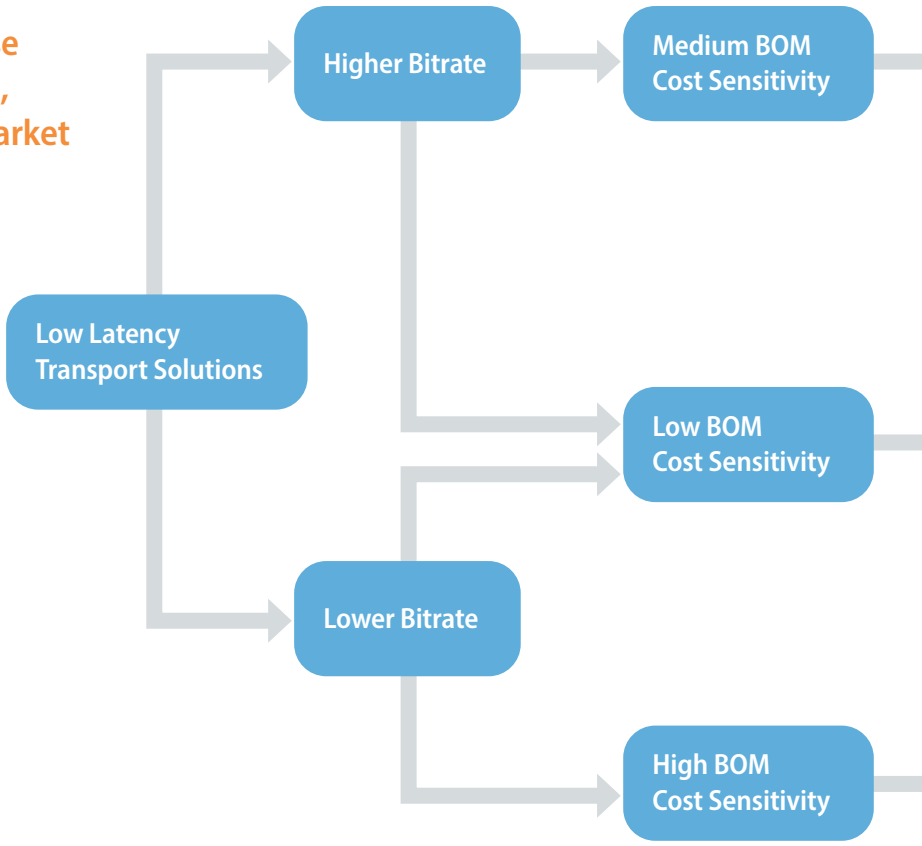
Simplifying FPD Sensor Interface Design

- Transmit real-time, low latency sensor data over a secure 1, 2.5, 5, or 10 Gbps GigE link to receiving software or hardware
- Easily integrate small footprint hardware and "zero footprint" FPGA IP Core software solutions into existing and new FPDs
- GigE Vision 2.0 compliance ensures interoperability in multi-vendor systems
- GenICam compliant interfaces provide easy access to programming features and simplify integration of FPDs into existing or new systems
- Image management tags an image or group of images with metadata — provides context necessary to retrieve image data from the on-board frame buffer, protecting valuable patient X-rays in event of power or network failure at the receiver
- IEEE 1588 Precision Time Protocol — synchronize multiple FPDs to a network master clock with up to 1 µs (microsecond) precision



Pleora Technologies

Pleora's high-performance, low latency sensor networking expertise provides bandwidth, cost, and time-to-market advantages



Product Line

Flexible, Zero Footprint, High-Bandwidth IP Core

CoreGEV-Tx10 GigE Vision FPGA IP Core

- 10 Gbps transmission of uncompressed images over Ethernet
- Generic AXI ports enable rapid connection to CPU system, memory system, MAC/PHY and sensor interface
- Flexible Hybrid Architecture reduces development time and risk by allowing designers to run full GigE Vision protocol from a software-only mode for rapid system level evaluation, implementation, and testing

Off-the-Shelf 1 Gbps Embedded Hardware

iPORT NTx-GigE

- Up to 32-bit, 120 MHz parallel LVTTL/LVCMOS video input, and 4 interleaved taps
- 120 MB frame buffer to accommodate multi-mega pixel sensor sizes

iPORT NTx-Mini and NTx-Mini with RapidPIX

- Up to 24-bit, 90 MHz parallel LVTTL/LVCMOS video input, and 2 interleaved taps
- 32 MB frame buffer for store-and-forward applications
- Transmit almost 2 Gbps of data over 1 Gbps infrastructure with patented RapidPIX lossless compression

FPGA IP Core

Flexible, zero footprint approach supporting 10 Gbps transmission

- Maximum design choice with full control over form factor and connector options
- Implement full GigE Vision connectivity into your existing FPGA with no additional components
- Application flexibility — IP Core manages GigE Vision traffic while empowering end-user processor to fully own and manage the Ethernet link

Embedded Hardware

Compact drop-in sensor interface for new and retrofit design

- Reduce development costs and speed time-to-market by leveraging drop-in, standards-based technology for all transport requirements
- Simple pixel bus interface and serial ports for control and communication ensure easy integration into final system
- Field-proven in medical and industrial FPD applications

Software Transmitter

Software implementation of a full device level GigE Vision transmitter

- Simple to implement – stream sensor data from FPD without any additional hardware
- Highly tuned code for minimal CPU utilization impact and maximum transmit performance

High-Bandwidth Receive Software

eBUS Receive for Host Applications

eBUS Receive manages high-speed reception of images or data from FPDs into buffers for hand-off to the end application for further analysis. With eBUS SDK, developers can write applications that run on a host computer to seamlessly control and configure an unlimited number of GigE Vision and GenICam compliant FPDs.

Higher Bandwidth GigE Vision Embedded Hardware

iPORT NTx-NBT25 & NTx-NBT50

- Supports 1/2.5/5 Gbps transmission of uncompressed images over standard Cat 5e Ethernet cabling for distances up to 100 meters
- Small footprint hardware easily integrated into existing and new imaging device designs

iPORT NTx-Deca

- Supports reliable high-speed transmission of video and sensor data at up to 10 Gbps over extended-reach Copper Cat 6A cabling
- Unique Image Management Database feature stores video frames for patient identification, video replay, and traceability requirements

GigE Vision Software Transmitter

eBUS Edge Software Transmitter

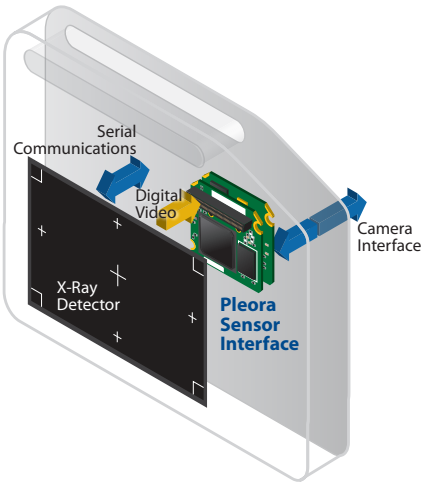
Adding eBUS Edge to a FPD's software stack turns it into a fully compliant GigE Vision device that supports image transmission and enables the FPD to respond to control requests from a host controller. eBUS Edge is GigE Vision and GenICam compliant, meaning end-users can use any standards-compliant third-party image processing system.

From medical imaging to industrial inspection and security, Pleora's end-to-end sensor interface products are enabling design, usability, and cost advantages in X-ray FPD applications.

Medical Radiography

Develop high-performance panels that leverage networking and cost benefits of Ethernet

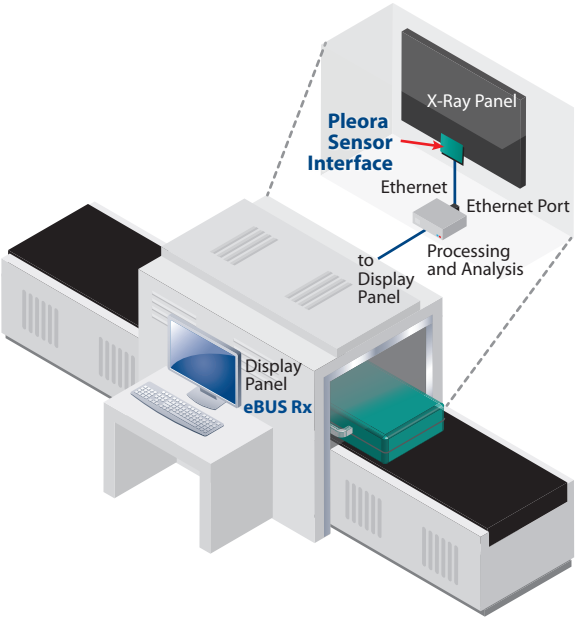
Pleora's embedded interfaces are based on a modular architecture that delivers video with high reliability and low consistent latency over GigE, GigE over NBASE-T and 10 GigE. This makes it fast and easy for manufacturers to create a family of FPDs with different interface options.



X-Ray Cargo Inspection

High-bandwidth, off-the-shelf interface solution for industrial FPDs

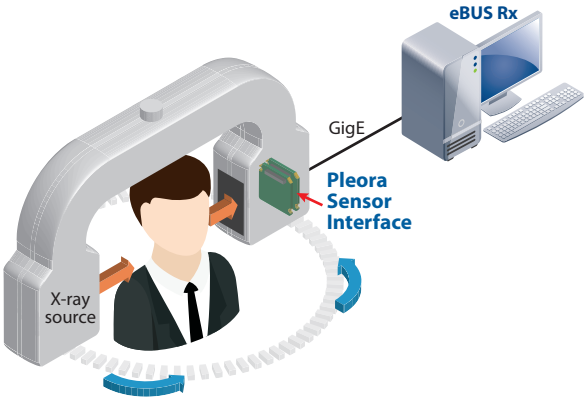
Pleora's embedded solutions help reduce design time and component costs of industrial FPDs. The interface solutions convert sensor data from FPDs into a high-bandwidth GigE Vision stream that is transferred with low, consistent latency to processing units and displays over an Ethernet connection.



Panoramic Radiography

Simplify design FPDs for panoramic radiography and X-ray dental systems

Pleora's embedded interfaces help manufacturers of FPDs for panoramic dental systems quickly and easily integrate high-performance sensor connectivity into their products. Transmitting images, control data, and power over a single flexible Ethernet cable ensures reliable performance in the rotating imaging system while eliminating reliability and costs issues associated with slip rings.



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