

The iPORT™ PT2000-CLM IP Engine

High-performance, ultra-efficient connectivity between Medium Camera Link® cameras and Gigabit Ethernet (GigE) links or LANS



Until now, applications based on Medium Camera Link cameras have been limited by:

- *Distance:* camera-to-PC connections extend only 10 m;
- *Cost:* camera-to-PC links require specialized frame grabbers; and
- *Networking:* connections are point-to-point, with no options for interconnecting multiple cameras or centralizing control and maintenance.

Pleora's iPORT PT2000-CLM IP Engine overcomes these limitations by allowing Medium-configuration Camera Link cameras to stream imaging data in real time over standard GigE links or LANs.

The engine grabs data from the Camera Link Medium camera, converts it to IP quickly and efficiently, and sends it to PCs over two synchronized GigE links. The data is transferred continuously at 2 Gb/s over inexpensive Cat-5 (Category-5) copper LAN cable.

At the PC, the Cat-5 cable plugs into a two standard GigE NICs (network interface cards/chips), eliminating the need for frame grabbers.

Point-to-point connections extend 100 m. With low-cost GigE switches, the reach is

much further, and users gain immediate access to the wide range of Ethernet networking options. With GigE switches, users can, for example, interconnect multiple cameras, multicast data from one camera to multiple PCs, or distribute image processing across multiple PCs.

The PT2000-CLM also handles control signals from the PC and other system elements. These signals are routed through a PLC (programmable logic controller) that allows users to precisely measure and control the operation of conveyors, encoders, cameras, and other components – either independently from or in conjunction with the host PC on the network.

As one element of Pleora's end-to-end iPORT Connectivity Solution, the PT2000-CLM engine is shipped with two powerful pieces of PC software. The iPORT IP Device Driver streams data to PC memory using minimal CPU capacity. The iPORT Software Development Kit (SDK) gives users the building blocks needed to quickly and easily enable third-party or custom video applications.

The engine is available boxed or as an OEM board.

The iPORT PT2000-CLM IP Engine

Data Acquisition Features	
Camera Link-compliant	<ul style="list-style-type: none"> Compatible with most Medium-configuration Camera Link cameras
Integrated acquisition engine	<ul style="list-style-type: none"> Can acquire images from a wide variety of sources, with pixel depths up to 16 bits, color or B/W, and multi-tap at up to 66 MHz
Free running or externally triggered	<ul style="list-style-type: none"> Flexible acquisition modes
Programmable Logic Controller	
Inputs: 2 TTL inputs 1 LVDS input 1 optically isolated input Outputs: 2 TTL outputs 1 optically isolated output	<ul style="list-style-type: none"> Allows synchronization of multiple cameras or equipment Flexible triggering capabilities, including Boolean combinations and Camera Link control signals Wide range of interface signaling options Provides an electrically isolated control interface
2 UART serial links: 1 LVDS, 1 LVCMOS/LVTTL	<ul style="list-style-type: none"> Serial control of camera and other devices via PC application over the GigE link
4 programmable pulse generators	<ul style="list-style-type: none"> Flexible trigger control that can be attached to any input or output or to internal signals
Delayer, rescaler, general-purpose counter	<ul style="list-style-type: none"> Allows full synchronization to line scan cameras Allows synchronized capture between multiple cameras Allows camera acquisition to track changing speeds on conveyor belts
Timestamp trigger, counter, and reset	<ul style="list-style-type: none"> Allows system actions to be triggered based on timestamps Allows resets to be broadcast to all iPORTs in system from host
Host interrupts	<ul style="list-style-type: none"> Allows host to be interrupted based on events on any input or internal signal

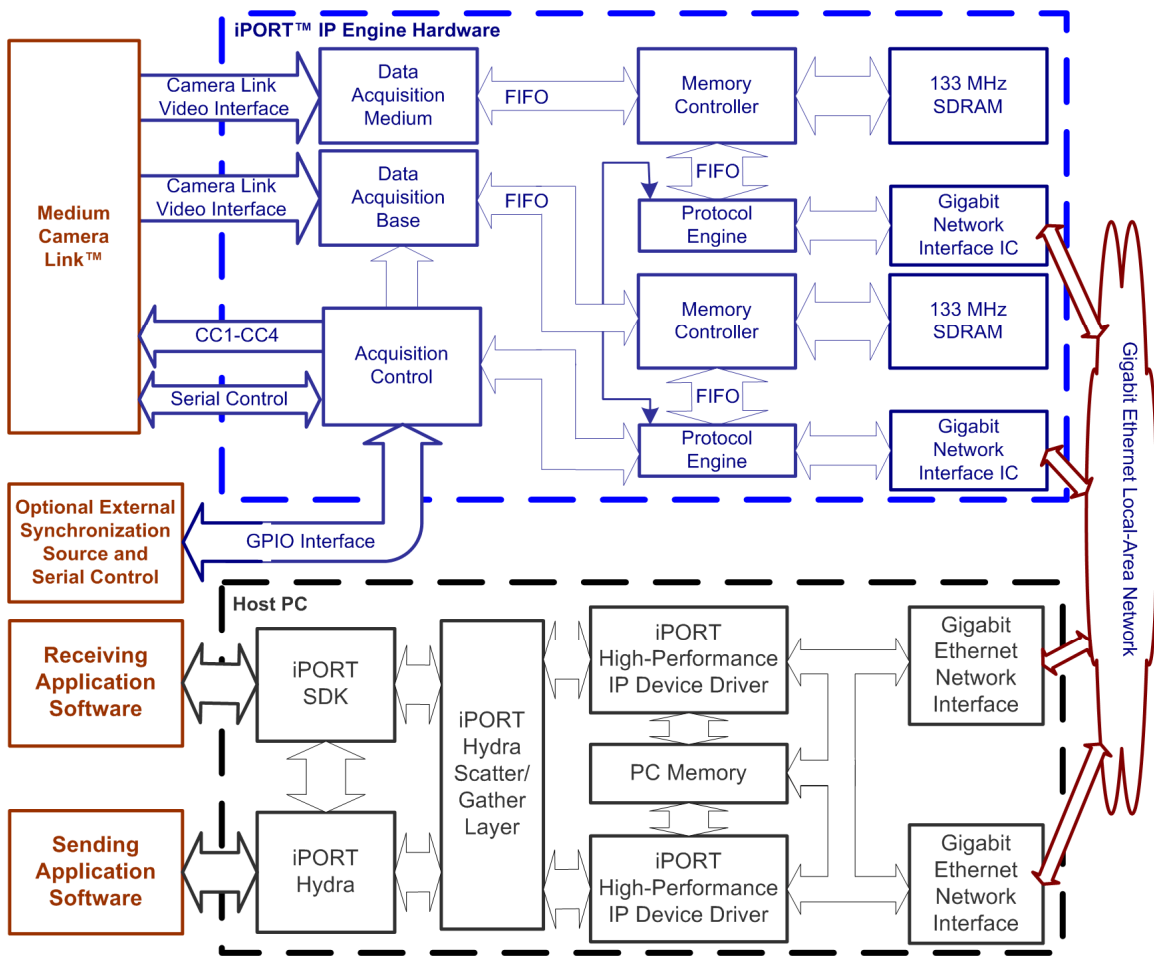
Characteristics	
Package	<ul style="list-style-type: none"> Boxed: 9.3 cm x 16.4 cm x 3.7 cm (L x W x D) OEM: 2 board sets, each 8.9 cm x 5.6 cm x 2.1 cm (L x W x D)
Operating temperature	<ul style="list-style-type: none"> Boxed: 0°C - 45°C OEM: 0°C - 70°C
Power supply	<ul style="list-style-type: none"> 4.5 V - 16 V
Power consumption	<ul style="list-style-type: none"> 5.2 W
Certification	<ul style="list-style-type: none"> CE (boxed only) and FCC

Connectors	
Power	<ul style="list-style-type: none"> Boxed: Hirose 6-pin (HR10A-7R-6P) OEM: Molex 4-pin 6373 series (22-23-2041)
Network	<ul style="list-style-type: none"> 2 x RJ-45 Ethernet
Video	<ul style="list-style-type: none"> 2 x Female MDR-26 for Camera Link
GPIO and serial control	<ul style="list-style-type: none"> Boxed: Hirose 12-pin (HR10A-10R-12S) OEM: Sametec 16-pin 2 mm male header (TMM-108-01-G-D-SM)

Pleora's iPORT Connectivity Solution

Network Interface	
Gigabit Ethernet-based	<ul style="list-style-type: none"> • Dominant commercial LAN standard; low-cost, easy-to-implement equipment • Compatible with IP/Ethernet networks operating at 10/100/1000 Mb/s • Long reach: 100 m point-to-point. Further with economical Ethernet switches
802.3, Ethernet v2.0, IP, ICMP, UDP and PING support	<ul style="list-style-type: none"> • Works with standard, off-the-shelf Ethernet switches and networks
ARP and BOOTP capability	<ul style="list-style-type: none"> • In addition to static IP support, dynamically discovers and obtains IP addresses for all devices on network
iPORT Multimedia Streaming Protocol	<ul style="list-style-type: none"> • Guarantees efficient delivery of all packets • Delivers comprehensive data transfer diagnostics
Multicast capability	<ul style="list-style-type: none"> • Enables advanced distributed processing and control architectures
RJ-45 connector	<ul style="list-style-type: none"> • Inexpensive Category-5 LAN cabling, shielded or unshielded • Supports copper-to-fiber adapters for long-haul data transport
iPORT Protocol Engine	
FPGA-based; no embedded O/S or software	<ul style="list-style-type: none"> • Highly reliable, fast data transfer with low, predictable end-to-end latency • Wire-speed performance • Field-upgradeable via IP/Ethernet link • Supports custom processing
On-board 16 MB frame buffer	<ul style="list-style-type: none"> • Zero packet loss • Images can be recorded by the engine and played back at the host PC • Can be expanded to 128 MB
User-definable pixel packing	<ul style="list-style-type: none"> • Supports packed or unpacked data formats, as per application requirements
LED display	<ul style="list-style-type: none"> • Indicator for power, status, network availability, and bandwidth
iPORT High-Performance IP Device Driver	
Compatible with Intel PRO/1000 NICs (network interface cards/chips)	<ul style="list-style-type: none"> • Range of network cards supporting all PCI, PCI-X, and PCI-Express variants
More than 800 Mb/s payload data transfer	<ul style="list-style-type: none"> • High-performance streaming for even the most demanding applications
DMA transfer with zero CPU usage	<ul style="list-style-type: none"> • CPU available for PC-based processing tasks
Full Windows stack bypass	<ul style="list-style-type: none"> • CPU-efficient stack processing, enabling simultaneous, real-time applications processing
Jumbo frame support to 16 KB	<ul style="list-style-type: none"> • Highest transfer efficiency on networks supporting jumbo frames
iPORT Universal IP Filter Driver	
Uses manufacturer-supplied NIC driver	<ul style="list-style-type: none"> • Compatible with all commercial NICs • Supports laptop/notebook-based interfaces
Intelligent Windows stack bypass	<ul style="list-style-type: none"> • High-throughput data streaming with low CPU usage and simultaneous access to corporate networks using single network interface
iPORT Software Development Kit (SDK)	
Comprehensive C++ libraries	<ul style="list-style-type: none"> • Simplifies development of high-performance, easily maintainable applications
Visual Basic library	<ul style="list-style-type: none"> • Fast prototyping and application development
Windows 2000, XP, and Red Hat and SuSe Linux	<ul style="list-style-type: none"> • Flexible choice of application platform
OCX Control (display) COM+ Components (libraries) Buffer Interface	<ul style="list-style-type: none"> • Fast time-to-market with custom applications using buffer interface or OCX controls • Compatible with third-party vision packages, such as National Instruments' Labview, Media Cybernetics' Image Pro, MV Tec's Halcon, IO Industries' Video Savant, Matrox' MIL, Euresys' eVision, Norpix' StreamPix, Stemmer's Common Vision, Coreco's Sapera, and others.
Multiple classes	<ul style="list-style-type: none"> • Comprehensive toolsets for communications, imaging, device and data control and display, and configuration management
Sample application source code and executables	<ul style="list-style-type: none"> • Provides working applications for device configuration, data acquisition and triggering, and display and diagnostics • Enables instant data access and fast application development
Compatible with Pleora's iPORT Hydra™ software	<ul style="list-style-type: none"> • Gives applications easy access to real-time GigE pipelining architectures

Pleora's iPORT Connectivity Solution



End-to-end architecture for iPORT solution using the PT2000-CLM IP Engine and iPORT Hydra

Order Codes:

iPORT PT2000-CLM (Boxed)PT2000CLM-E
 iPORT PT2000-CLM Development KitPT2000CLM-DEV
 iPORT PT2000-CLM (OEM)Contact Pleora

All products include a CD with PC driver, SDK, sample application source code, and user documentation. The Development Kit includes a boxed version of the PT2000-CLM IP Engine, a power supply, a network card, and cabling.

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