GE
Intelligent Platforms

PACSystems

Control Memory Xchange

imagination at work

High-Speed Memory Sharing

The simple, yet powerful, architecture of our Control Memory Xchange enables global shared memory—providing real-time speed and deterministic performance without the data collisions and latencies of other network technologies.

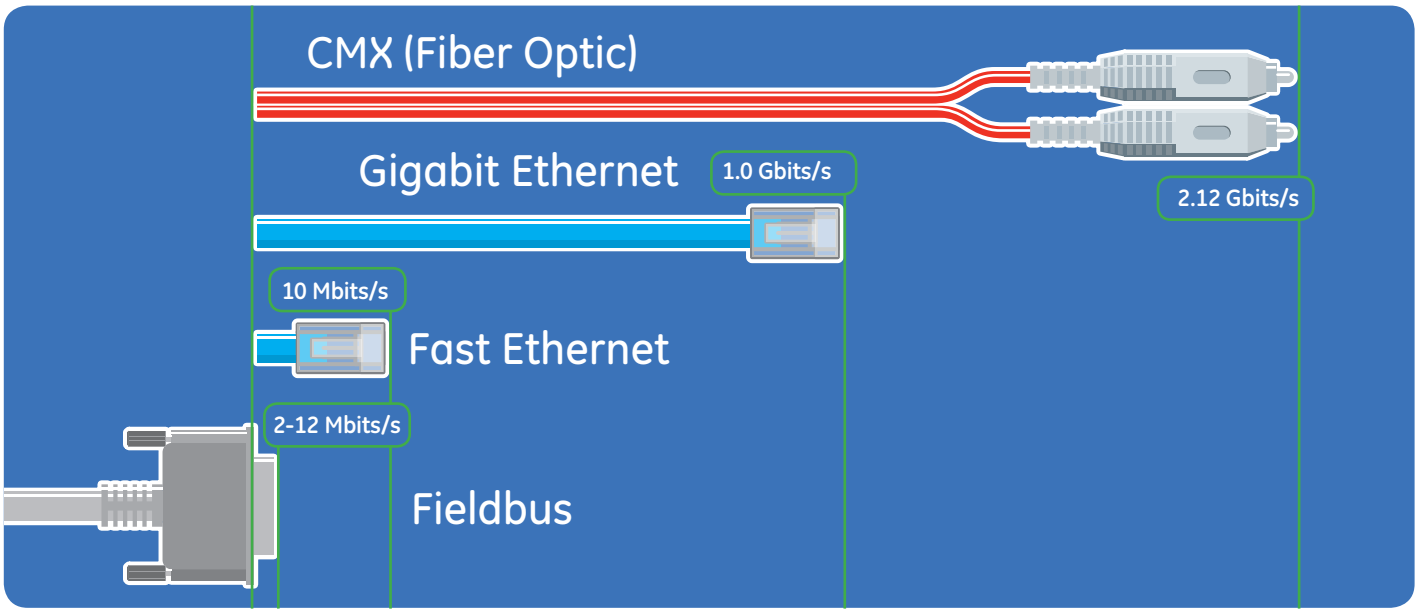
When speed of operation is essential, PACSystems* Control Memory Xchange (CMX) from GE Intelligent Platforms enables users to have access to a large memory space, as well as ultra-low memory access latency and high bandwidth. Easy to use, and with no messaging required, global system memory is exactly what you would expect from an all-in-one system. And the system can be scaled beyond just the control—providing superior performance, flexibility and reliability.

PACSystems CMX technology is built on reflective memory. This high-speed memory sharing allows multiple devices to share large amounts of control data over a fiber-optic deterministic network, at speeds up to 20 times faster than Ethernet. Operating in parallel to the main logic controller, Control Memory Xchange has minimal effect on scan time.

The CMX controller writes data to shared memory, and the data is broadcast immediately to all other nodes on the network at rates of up to 174 Mbytes per second, with node-to-node latency as low as 450 nanoseconds. Each controller keeps a local copy of the shared data for fast, real-time speed and deterministic performance.

Benefits of Control Memory Xchange:

- Greater ease in running applications with large memory demands
- Improved data handling between systems
- Flexible programming models for real-time distributed control
- Data as current as your scan time, eliminating the need to factor in latency



Providing a sustainable competitive advantage, the PACSystems CMX is a true game changer for applications such as material handling, packaging and assembly — as well as high-speed applications — where multiple controllers are networked.

Easy and Flexible

In the past, the only way to provide global shared memory in an industrial control system was to designate one system for the memory, establish a communication network with all systems, and have a user-developed message system move data to and from the memory. PACSystems CMX changes this paradigm.

Implements easily — just write it and read it.

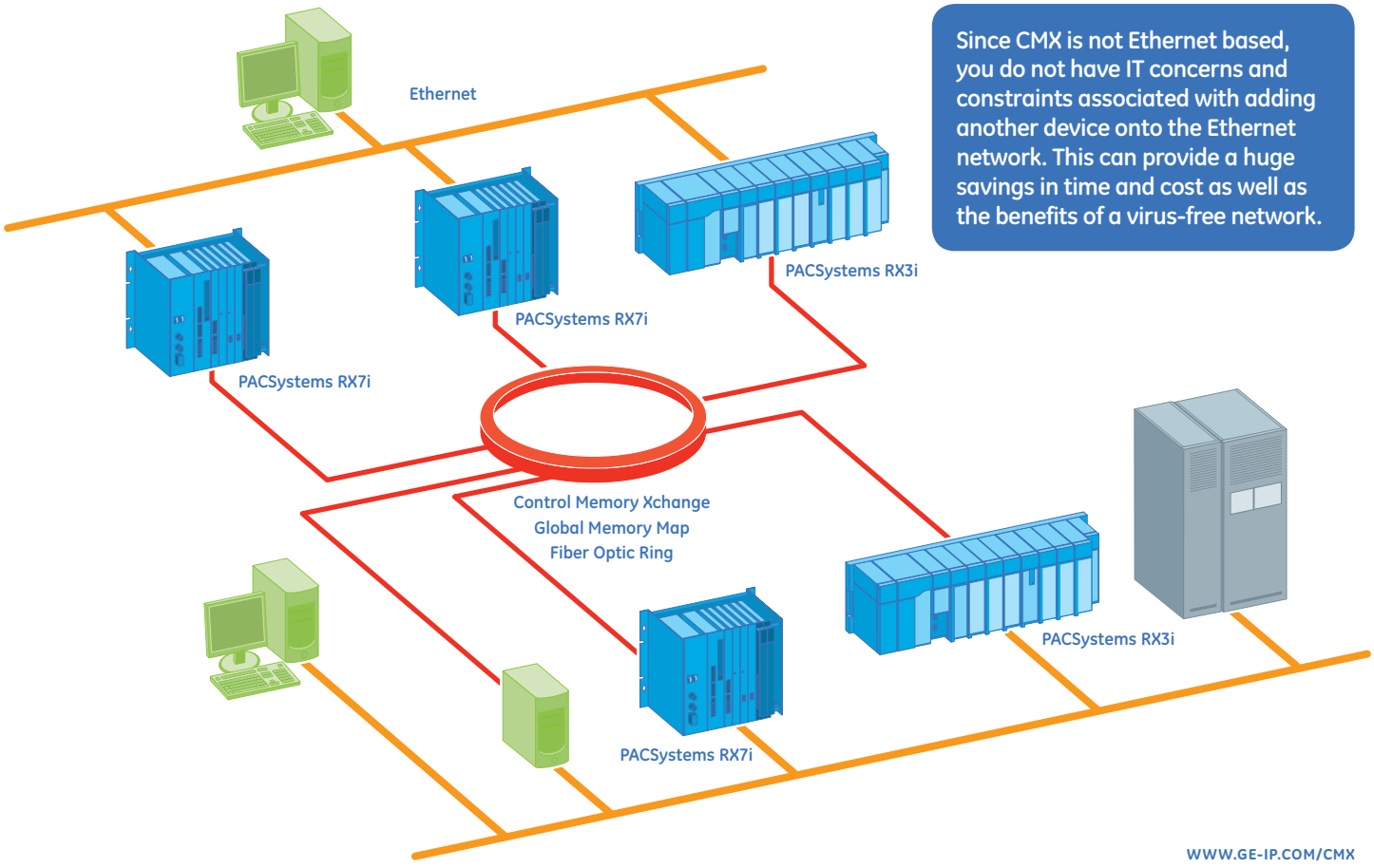
Data transfer is absolutely automatic. This results in significant cost savings in software development since no application code needs to be written, tested, documented or maintained for assembling and decoding messages and distributing data from incoming messages.

Easy fiber connections for distance and noise immunity.

PACSystems Control Memory Xchange permits data sharing between as many as 256 independent systems or nodes, configured as either a ring or hub, on fiber optic networks at distances of up to 10 km.

Integrates flexibly with a variety of operating and hardware systems.

The system is designed to share data among systems, regardless of processor type, operating system and bus structure. It is available in multiple form factors for PLCs and PCs, including VME bus and PCI bus, and features drivers to connect with GE Intelligent Platforms Proficy* software as well as third-party software applications.



Since CMX is not Ethernet based, you do not have IT concerns and constraints associated with adding another device onto the Ethernet network. This can provide a huge savings in time and cost as well as the benefits of a virus-free network.

Powerful, Fast and Precise

With CMX, you can increase yield and quality, reduce scrap, improve access to data and maintainability, and modernize your existing production lines.

Position Control and Speed/ Loop Control

Do you need fast, deterministic exchange of information between systems running drives?

Does your application require precise, coordinated speed control between multiple areas?

Control Memory Xchange provides just the answer with an ultra high-speed exchange of memory between controls. Using simple read/write instructions in your application program—event, timed or on command—megabytes of data will transfer instantly from one controller to another controller, ready for use in under a millisecond.

You can change the accuracy and speed of your application by a factor of 10 or more over traditional Fieldbus or Ethernet transmissions—all while using noise immune fiber, the same type used for Ethernet.

Application Example: Hot Strip Mill

The challenge:

This user had legacy drive controllers and PLC controllers throughout its hot strip mill. The driving force was a need to improve its quality—specifically profile, shape and gauge. The drive control systems were proprietary, and the customer did not "own" the ability to modify, maintain and make changes to keep its systems operating at optimum levels. It wanted an open, flexible system based on technologies it could own and maintain. And, there could be no downtime while installing the new system; it had to be completed as part of a scheduled maintenance period.

The solution:

The user replaced the drive controllers and PLCs with Open PACSystems Control Memory Xchange.

The results:

- Disparate control system reduction—from three down to one
- New system costs were 30% lower than alternatives
- No downtime—installation completed during scheduled maintenance
- Profile, shape and gauge accuracy improved
- Savings of $20,000+ per year in maintenance and support

Data Collection and Monitoring

Do you need continuous, fast access to large amounts of production data in real time?

Do you need to make fast execution changes based on that data?

Control Memory Xchange provides access to thousands of bytes of variable data in milliseconds from control to control, or to HMI/SCADA systems for instant production adjustments. With large memory transfers occurring on a single read or write, you can now make changes in application execution in milliseconds or in the time it takes an operator to see the information, instead of waiting seconds or minutes.

Application Example: Pulp Press

The challenge:

The user was trying to optimize its process to improve quality and increase production rates. It knew that with the right data it could make adjustments to improve the process, but this would require gathering a large amount of data over a short period of time.

It needed the ability to detect sequencing errors such as valves opening or closing a few hundredths of a second too soon or too late, or actuators, motors and pumps slightly out of sequence. Once detected, these errors could be corrected in the PLC program. It needed more than just standard Fieldbus speeds to collect information from multiple systems.

The solution:

The user installed Control Memory Xchange in the legacy PLC and in a PC running Proficy HMI.

The results:

- → Identified and eliminated a 1/20 second pause
- → Cycle time reduced from 45 seconds to less than 35 seconds
- → Increased production by $15,000 per day or $5.2 million per year

Typical applications

Food/Beverage, Consumer Packaged Goods
→ Packaging lines

Metals
→ Continuous casters
→ Metal rolling
→ Processing lines

Pulp/Paper
→ Paper making machines
→ Material handling
→ Co-Generation

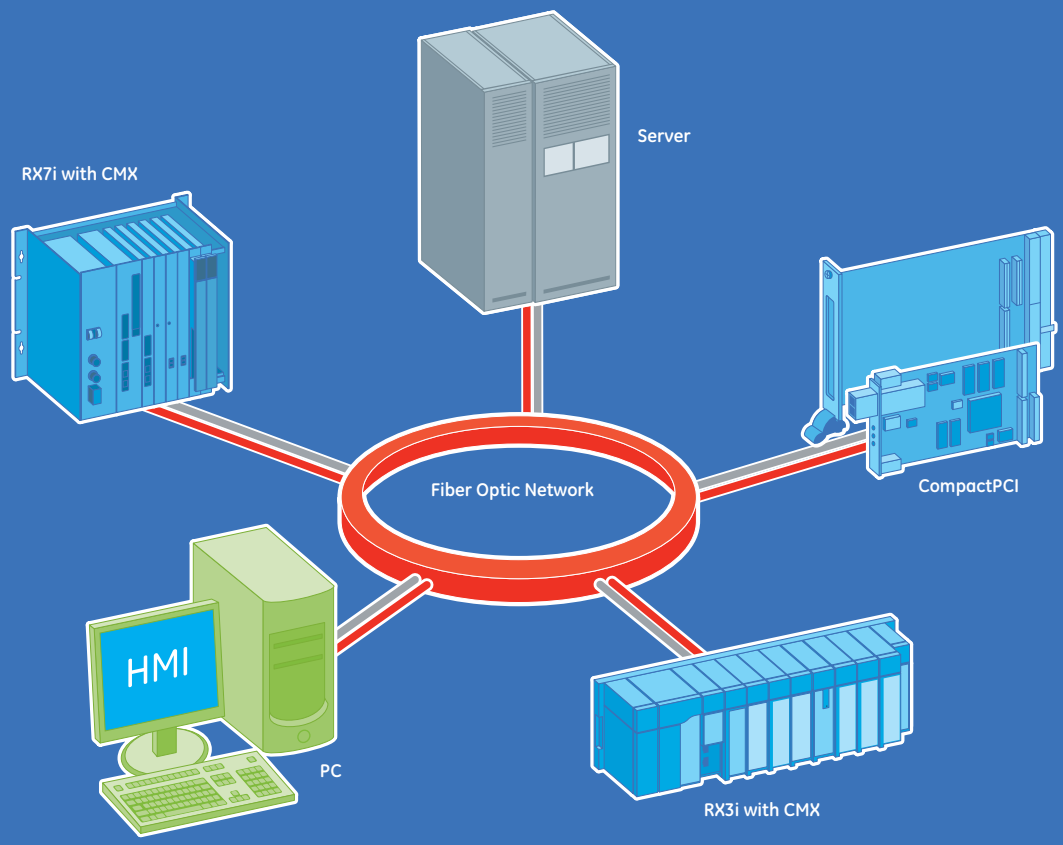
Transportation
→ Airport baggage handling

Data Warehouses
→ Emergency power

Common Network Configurations

Ring

→ Single fiber connection between devices



Fast Facts

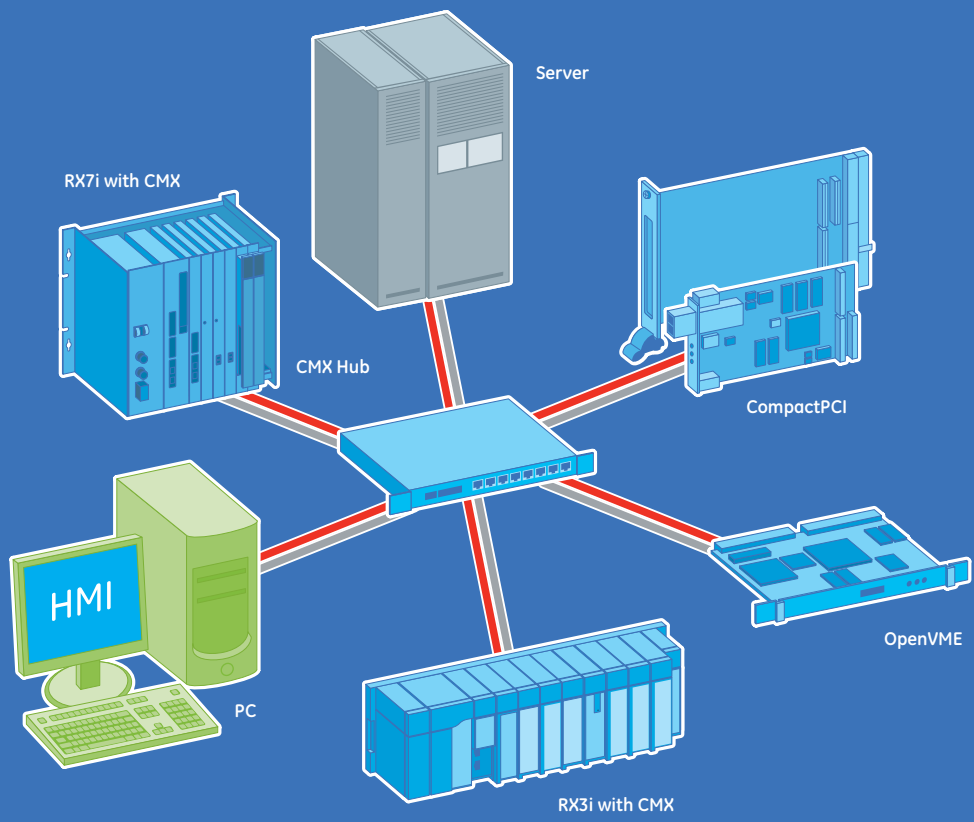
Network Speed	2.12 Gigabaud
Operating Systems Supported	→ Windows → Linux → VxWorks
Number of Nodes Supported	Up to 256
Topology Supported	Ring or Hub
Single Mode Multimode	Up to 10 km Up to 300 m
Media Type	Fiber

Transfer Rates	Maximum network transfer rate of 2.1 Gbits/sec
Distance Between Nodes	Multimode fiber up to 300 meters (984.25 feet)
Latency	Less than 500 nanoseconds per node
Network Interrupts	Four general-purpose network interrupts with 32 bits of data each
PACData Server Toolkit	PAC to PAC PAC to SCADA

Star

→ Use a Control Memory Xchange hub

→ Up to eight ports per hub



Redundancy	Network supports redundant packet capability
Software Overhead	Low overhead. Minimal impact except for logic bus read and writes
Connector Type	→ Fiber optic LC type, conforms to IEC 61754-20 → Zirconium ceramic ferrule → Insertion loss: 0.35 dB (maximum) → Return loss: -30dB

To learn more about how PACSystems Control Memory Xchange can improve the performance of your applications, visit www.ge-ip.com/cmx

GE Intelligent Platforms Contact Information

Americas: **1 800 433 2682** or **1 434 978 5100**
Global regional phone numbers are listed by location on our web site at **www.ge-ip.com/contact**

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