



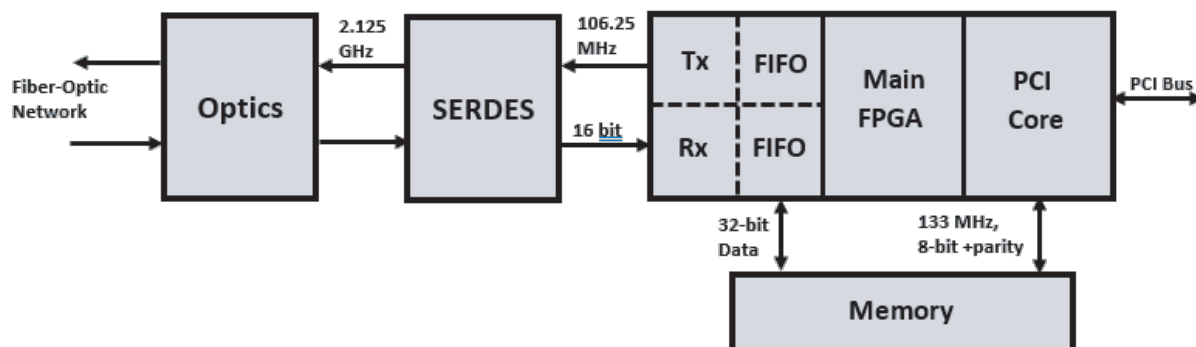
Reflective Memory

5565 Reflective Memory Node Cards

ULTRA-HIGH-SPEED, FIBER OPTIC NETWORK FOR DISTRIBUTED
PROCESSING USING REFLECTIVE MEMORY

Reflective Memory is an optical ring-based, ultra-high-speed shared memory network solution. It allows a distributed network to share real-time data at a deterministic rate, regardless of bus structures and operating systems.

The technology embraces an innovative and efficiently designed hardware platform that is easy to use, provides for greater distance between nodes, high noise immunity, optional node bypass, and no software overhead. Just read and write to the onboard memory and the Reflective Memory node controller does the rest.



APPLICATIONS

Real Time Low Latency Deterministic

Reflective Memory may be used in place of any application that uses Ethernet, Fibre Channel, or other serial networks to connect computers or Programmable Logic Controllers (PLCs) together.

- Aircraft simulators
- Aluminum rolling mill control/monitoring
- High speed data acquisition
- Automated testing systems
- Power plant simulators
- Over-the-horizon radar
- Ship & submarine simulators
- PLC users
- Engine test stands
- Industrial process control

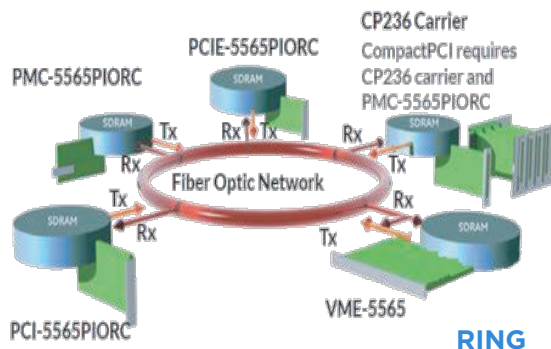
Reflective Memory is most relevant in systems where interaction in real time is a primary concern. In systems where determinism, low latency, and high-speed communication are necessary, Reflective Memory boards, while typically more expensive than lower performance computer hardware, provides a huge return in performance with the added benefit of ease of use.

Ring Network

A Reflective Memory ring-architecture network operates at rates of 2.12 Gbaud over a fiber optic ring. The ring topography ensures proper connectivity and does not impose additional loading restrictions or termination requirements.

Because Reflective Memory is not a collision-based bus arbitration system as most Ethernet systems are, it avoids the complexities required for queuing and checking data packets.

These attributes allow data transfer rates of 170 MB/s for Reflective Memory, compared to about 100 MB/s for Gigabit Ethernet (excluding protocol overheads). Each port regenerates the serial optical signal, eliminating the problems with insertion losses and cable attenuation. Signal regeneration also reduces jitter.



Star Network

The ACC-5595 fiber optic hub enables an RFM network to bypass failed nodes, ensuring that such a condition does not crash an entire network. Hubs can be cascaded, permitting a managed hub array with up to 256 nodes.

FEATURES + BENEFITS

Designers can eliminate most communication latency and realize drastic improvements in resource utilization over traditional LAN technologies by using Reflective Memory.

Features

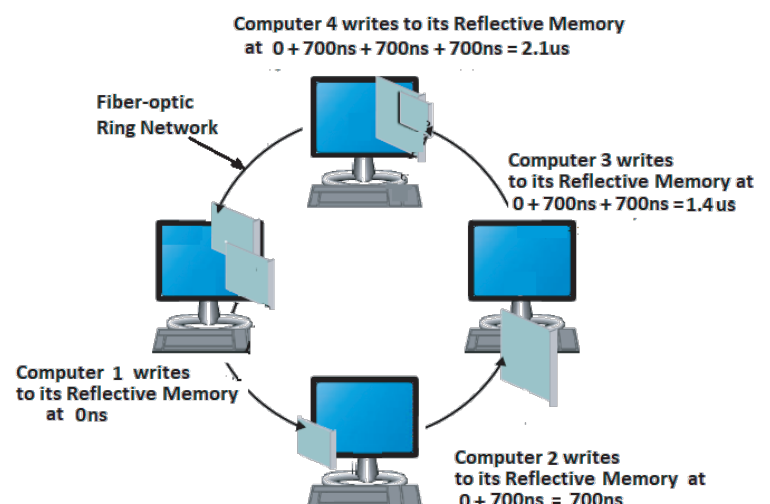
- 2.12 Gbaud serial connection speed
- Supports dynamic packet sizes ranging from 4 to 64 bytes
- Up to 170 Mbyte/s sustained data rate
- Deterministic transfer rate with only 450 to 500 nanoseconds of latency between nodes
- Error management and detection protects against lost data
- Interrupt transfers support for any node
- 128 or 256 Mbytes of onboard SDRAM
- Multimode fiber supports up to 300m, single mode fiber supports up to 10 km.

Benefits

- Highly scalable technology supports up to 256 nodes
- Bus independent design protects investments in your current network infrastructure
- Low latency, deterministic data transfer rate allows for predictable, high performance application deployment
- Seamless integration with J-Squared integrated solutions and most industry standard offerings
- PIO versions offer improved PIO read performance and field upgradeable firmware

Deterministic Data Transfers

All data transferred to a Reflective Memory node is stored in local memory and automatically sequenced out to all the other nodes' memory. There are no software delays and minimal hardware delays associated in the data transfer. Any latency is imposed at the hardware level and can be predetermined within a very small window of best-to-worst case latency.



SPECIFICATIONS

General

Data Transfer (redundant)	20 MB/s (single longword), 87 MB/s (64-byte bursts)
Data Transfer (non-redundant)	43 MB/s (single longword), 170 MB/s (64-byte bursts)
PCI Transfer Rate	Varies by bus configuration - Consult factory
PCI Express Transfer Rate	4 lanes at 2.5GHz
SDRAM	128 or 256 Mbyte

Card-Specific

Parameter	PCIe PIO	PCIe	PCI PIO	VME	PMC PIO
Onboard FIFO	----	----	4K	4K	4K
+12Vdc Current (max)	0.7A	0.6A	----	----	----
+5Vdc Current (max)	---	---	1.8A	5.0A	1.8A
+3.3Vdc Current (max)	0.6A	1.6A	1.5A	---	1.5A
MTBF (hrs)	607K	607K	1.2M	164K	1.3M

Network

Media	Fiber-Optic
Topology	Ring or Star
Transmission Speed	2.1 GBaud/s
Data Transfer Speed	170 MB/s
Distance Between Nodes	300m (multimode SFF), 10km (single mode SFF)
Deterministic Tx / Rx	Yes
Network Transfer Scheme	Data Insertion
Endian Data Conversion	Yes

System Software

Operating System Support	Windows 10 IoT, Linux, VxWorks, Solaris, Irix
CPU Overhead	None
Error Check/Handling	Transparent
App required	No (Memory Mapped I/F)

Environmental

Operating Temperature	0 to +650C
Storage Temperature	-40 to +850C
Relative Humidity	20% to 80%, noncondensing

ORDERING INFORMATION



PCI-E-5565PIORC-ABCDEF

A = Memory Options

0 = Reserved

1 = 128 Mbyte

2 = 256 Mbyte

B = 0 (reserved)

C = Transmission Mode

0 = Multimode

1 = Single Mode

D = Bracket Option

0 = High profile

1 = Low profile

EF = 00 (reserved)



PCI-E-5565RC ABCDEF

A = Memory Options

0 = Reserved

1 = 128 Mbyte

2 = 256 Mbyte

B = 0 (reserved)

C = Transmission Mode

0 = Multimode

1 = Single Mode

DEF = 000 (reserved)



PCI-5565PIORC ABCDEF

A = Memory Options

0 = Reserved

1 = 128 Mbyte

2 = 256 Mbyte

B = 1 (4k FIFO)

C = Transmission Mode

0 = Multimode

1 = Single Mode

DEF = 000 (reserved)



VME-5565 ABCDEF

A = Memory Options

0 = Reserved

1 = 128 Mbyte

B = 1 (4k FIFO)

C = Transmission Mode

0 = Multimode

1 = Single Mode

DEF = 000 (reserved)



PMC-5565PIORC ABCDEF

A = Memory Options

0 = Reserved

1 = 128 Mbyte

2 = 256 Mbyte

B = 1 (4k FIFO)

C = Transmission Mode

0 = Multimode

1 = Single Mode

DEF = 000 (reserved)

J-Squared Technologies Inc.

J-Squared has been supplying the North American electronics marketplace for over 25 years with electronic products and services in a myriad of market sectors including Military, Aerospace, Industrial, Energy, Transportation and Medical, all backed by its world-class Maintenance, Repair and Overhaul (MRO) facilities in North America.



J-Squared provides innovative, flexible and customized solutions for critical OEM projects, as well as advanced embedded computing platform designed for stringent and rugged environments, BOM enhancements, and a wider range of legacy IO support.

Rapid growth in the embedded markets, coupled with open standards, drive higher levels of product integration and optimization through network connectivity, remote management, mobile communication, expanded I/O, and device-to-device communications, using space and power efficient configurations.

Quality, Reliability and Customer Satisfaction

Integrating only the best quality class components into its system boards, servers, and chassis, J-Squared adheres to rigorous design implementation and AS9100 manufacturing standards, to ensure that its products are produced with the highest quality and reliability for the most demanding applications to optimize system performance and minimize system downtime. J-Squared stands behind all of its products with a comprehensive warranty and replacement policy, with a highly responsive Technical Support team to quickly resolve any support issues.