Industrial Ethernet Protocols

	EtherNet/IP	PROFINET	EtherCAT	ETHERNET POWERLINK
Developer	Rockwell Automation	Siemens	Beckhoff Automation	B & R Automation
Standards Body	ODVA	PNO/PI International	EtherCAT Technology Group	Ethernet Powerlink Standardization Group
Real-time Approach	S/S: Standard Software/Standard Ethernet	O/M: Open Software/Modified Ethernet	O/M: Open Software/Modified Ethernet	O/S: Open Software/Standard Ethernet
Description	EtherNet/IP is a very widely supported protocol that uses standard Ethernet hardware and both TCP/IP and UDP/IP for transferring data. It has limited real-time capabilities vs some other protocols, but it's able to run servo-motor controls as well as having broad applicability to discrete-control industrial automation systems.	Covers discrete/factory automation and process automation in addition to motion control. Encompasses two performance classes - PROFINET RT (real-time) or PROFINET IRT (hard real-time).	EtherCAT (based on the summation frame method) and the Open Software / Modified Ethernet methodology and is capable of very fast speed with its "processing on the fly" principle where EtherCAT messages are passed before processing at each node.	Ethernet Powerlink is a real-time protocol for standard ethernet, fully supporting TCP/IP. The protocol provides high performances and clear diagnostics and brings together Ethernet, CANopen and hard real-time capabilities.
CABLING TOPOLOGIES:				
Tree Topology	X	X	May be applicable	X
Star Topology	X	X	May be applicable	X
Ring Topology	X	X	X	X
Daisy-chain Topology	X	X	X	X
INTERNATIONAL STANDARDS SUPPORT:				
IEC 61158	Type 2	Type 10	Type 12	Type 13
IEC 61784-2	CPF 2	CPF 3	CPF 12	CPF 13
GB National Chinese Standard	GB/Z 26157-2010	GB/Z 25105-2010		GB/T 27960-2011
CAPABILITIES AND PERFORMANCE:				
Downward Protocol Capability	X	X	X	X
Cycle Time Performance	May be applicable	RT: May be applicable IRT: X	X	X
Heavy Data Prioritization	X	X	May be applicable	X
Gigabit Readiness	X	RT: X IRT:		X
EMC Susceptibility	X	X	May be applicable	X
Hot Plugging Capability	X	X	May be applicable	X
AVAILABILITY:				
Ring Redundancy	May be applicable	May be applicable	X	X
Master & Cable Redundancy	May be applicable	May be applicable	May be applicable	X

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