Lantech

Lantech Communications Global, Inc.

Pioneering Industrial and IP Networks

Lantech White Paper

Industrial Switch Technology and Market

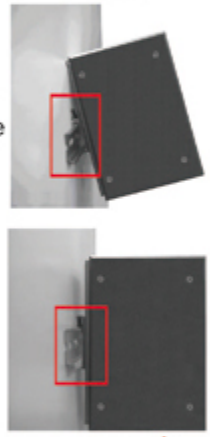
10 ms
X-RING

X-View

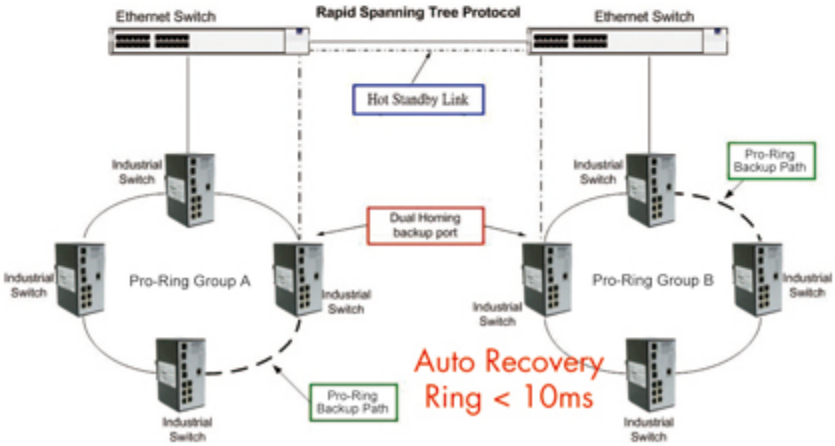
What is Industrial Switch

Industrial Switch is a term that comes from Factory automation, where they use Industrial PC's, PLC's (Programmable Logic Controllers), Control panels, and Device Servers (serial port connection) in control rooms and device networks. Given the importance of the internet, IT managers now want to connect all the Industrial PC's, PLC's, Control Panels, and Device Servers to the Ethernet network where they need an Ethernet Switch that can stand up to the various environmental challenges.

An Industrial Switch uses the same technology as commercial switches. The main differences are that the hardware is made with more durable components capable of withstanding a wider temperature operating range. Industrial Switches are typically in a different form-factor than a traditional 19" rack mount switch. Most Industrial Switches are capable of being DIN-Rail mounted, which is standard for mounting equipment in control room racks.


Din Rail mounting

Due to the hardware characteristics of Industrial Switches, they are useful in other markets and applications. Any application that may be sensitive to dust, rain, wind or temperature is a perfect fit for Industrial Switches. These applications may include Transportation, Surveillance, ISP's, Telecom, Power Utilities, Sub-Stations and Oil Platforms. There are special software and hardware features used in different market segments. The most common software feature is a Ring architecture, which has evolved from the commercial RSTP protocol, but with a much faster recovery algorithm. Most Ring architectures will self heal in less than 300ms down to 10ms compared to a 3 second recovery time for RSTP. The Ring topology is an advantage in surveillance systems or transportation applications where you could connect many cameras, DVR's, display monitors and switches. Lantech promotes its own Ring topology called Pro-Ring with either 300ms or 10ms recovery times depending on which model. Besides the Pro-Ring feature, Lantech switches are built with IGMP Query & Snooping functions to handle big image flows in Industrial network applications.



Industrial Switch Market Segments

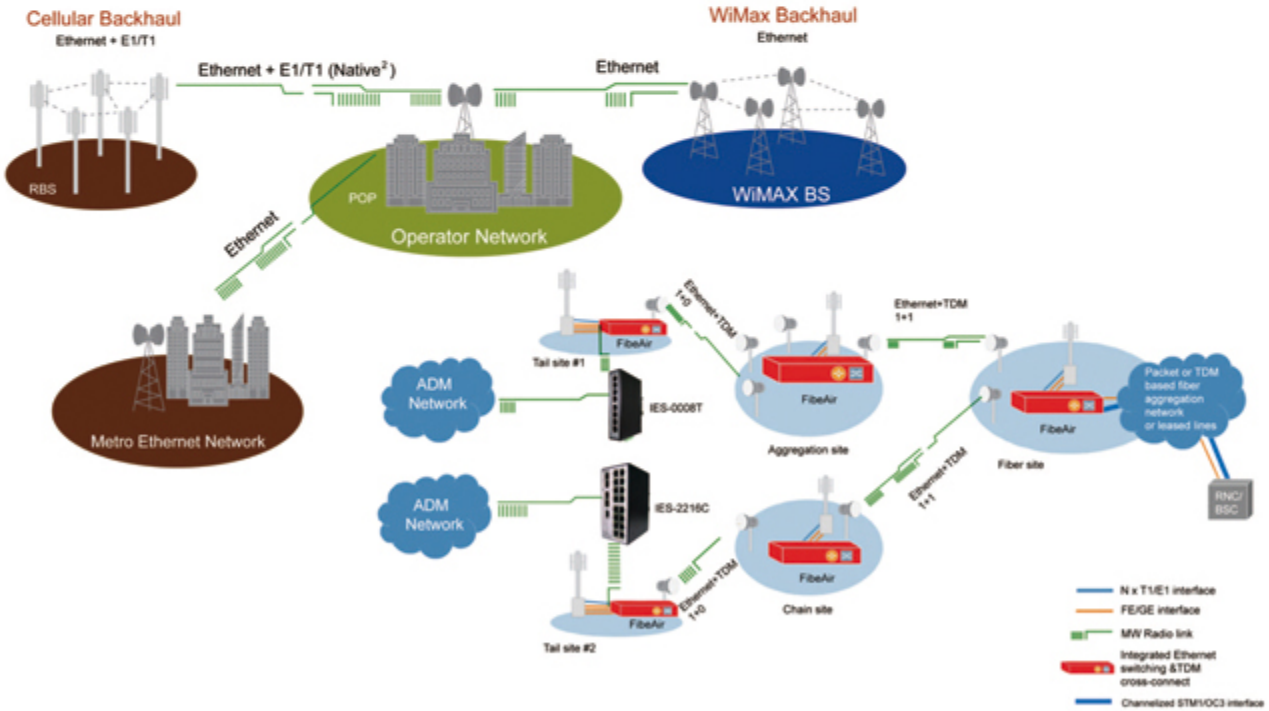
The Markets

Factory Automation

In Factory Automation applications, there is sometimes the need for Real Time protocols, which include ProfiNet by Siemens, EthernetIP by Rockwell, and ModBUS by Schneider. The Real Time protocols were developed by the need of PLC's connecting with robotic arms, conveyor belts and other automation devices. This created the need for switches to be compatible with Real Time protocols. Ethernet switches that support Real Time protocol are typically very expensive and mostly come from the original Real Time protocol vendors like Siemens, Rockwell and Hirschman. The factory automation market is very conservative and relies more on features than price. But for smaller factories, there is a demand for unmanaged Industrial switches and fiber Ethernet converters for simply passing data to the control rooms.

ISP / Telco for FTTX

In the ISP or Telecom markets where they need Industrial switches is in part because they need to place switches outside to connect with the FTTX network. For example, the outdoor switches are placed on top of a utility pole and via fiber they connect to homes and buildings. ISP's that use wireless backhaul need to configure their wireless network through a network switch. These switches are exposed to outdoor elements, creating the need for an Industrial Switch. In these applications, ISP's and Telecom providers will need cost-effective products with enterprise class software features like LAN, ACL, QinQ, MVR and MSTP. Real Time protocols are not as important to them as they will use routing from a control room switch which uses RSTP / MSTP in connection with all the outdoor Industrial Switches.



Power Station

In the Power station and substation markets, there is another standard called IEC61850-3 that addresses the heavy EMI interference commonly found in power station environments. IEC61850 was initiated in the late 1980s by major North American utilities under the technical auspices of EPRI (Electric Power Research Institute). The resulting standard that emerged is known as the Utility Communications Architecture 2.0 (UCA2.0) has become an international standard as IEC61850. IEC61850 certification includes testing for inductive load switching, lightening strikes, electrostatic discharges from human contact, radio frequency interference due to personnel using portable radio handsets, ground potential rise resulting from high current fault conditions within the substation, and a variety of other EMI phenomena commonly encountered in the substation environment.

Offshore Platform / Oil and Gas

Another Industrial Switch market segment is Marine applications. Marine applications have their own rugged environments. Products that have been tested for shock, vibration, excessive moisture, and erosion should have the DNV certification. Industrial switches will be used with other marine equipment, so it is important that the Industrial Switches avoid creating interference through EMI or DC conductive power systems, which can cause issues with compasses and other critical marine control equipment Industrial Switches can be used in any harsh environment, not just the applications mentioned above. The need to isolate dust, shock, vibration, moisture or temperature is involved in many applications.

IP67 / M12 Anti-Dust and Water Proof

Industrial switch hardware design is varied for different market segments. For example, IP 30 and IP67 case enclosure certifications are different depending upon the level of need for eliminating dust and moisture. RJ45 and M12 connectors are different depending on the different type of cables being used.

When selecting an Industrial Switch vendor, it is important to look at the hardware, software, and the needs of the vertical market application. Lantech products are designed for focus in the IP Transportation, IP Security and Surveillance, ISP and Telecom, and FTTx and Wifi/WIMAX backhaul markets. Lantech also has select models that have DNV certification for on-shore and off-shore Marine applications.