ETHERNET DIRECT

THE IMPORTANCE OF POWER SAVING TECHNOLOGY & POWER PROTECTION

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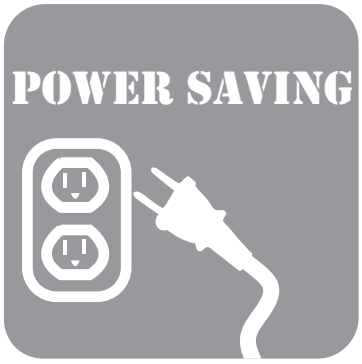


Ethernet Direct Corporation is committed to offering products which meet their specific needs while complying with RoHS legislation. The dedication to create a safe and clean environment and restrict the use of certain hazardous substances currently used in EEE manufacture, including lead, mercury, cadmium, hexavalent chromium, and halide-containing compounds PBB (polybrominated biphenyl) and PBDE (polybrominated biphenyl ether). Elimination of these substances will result in more environmentally-friendly recycling and incineration of electronic equipment. Due to environmental concerns, the need for lead-free solutions in electronic components and systems is receiving increasing attention.

In addition, Ethernet Direct pioneers in designing Industrial Ethernet equipments with Power Saving technology, also known in the commercial enterprise switch industry as Green Ethernet. What is the importance of power saving technology in switches? Why is it necessary? What are the advantages?

Advantages of Power Saving Technology

Power Saving technology into Industrial Ethernet equipments is capable of decreasing energy costs through the reduction of power consumption without sacrificing any operational performance or functionality. It makes a product eco-friendly and thus, complying with the RoHS (Restriction of Hazardous Substances) and WEEE (Waste Electrical and Electronic Equipment) directives.

The key advantages are:

- Reduced power consumption
- Lesser heat dissipation
- Extended product MTBF and product life
- Reduced in operating costs
- Saves power, energy, money and carbon

How Power Saving Technology Work

Industrial switches are operating continuously in an industrial environment, unlike a home device wherein it is shut down when not in use. Therefore, an Industrial Ethernet device consumes considerable amount of power. With the power saving technology, the installed Industrial Ethernet switches can detect when the idle ports in use to reduce the power usage for the idle port and then respond accordingly by changing into power standby mode. In normal condition, switches normally send full power to cables regardless of the actual length. With the power saving technology can analyze the length of a cable and adjust the power consumption accordingly.

ED Power Saving Technology Logo

Ethernet Direct aims to the contribution to conserve energy worldwide. Power is conserved when links are idle or ports not in use which is a lasting technology innovation in Industrial Ethernet environment. By optimizing the power usage by means of automatic cable length detection can also significantly reduced power consumption.

Industrial Ethernet Switches with Power Saving Technology

Industrial Extended Temperature Unmanaged Switch	
IUE-500E	Industrial Extended Temperature 5 10/100TX Unmanaged Switch
IUE-800E	Industrial Extended Temperature 8 10/100TX Unmanaged Switch
IUE-411E	Industrial Extended Temperature 4 10/100TX + 1 100FX Unmanaged Multi-mode Fiber Switch
IUE-413E	Industrial Extended Temperature 4 10/100TX + 1 100FX Unmanaged Single-mode Fiber Switch
IUE-421E	Industrial Extended Temperature 4 10/100TX + 2 100FX Unmanaged Multi-mode Fiber Switch
IUE-423E	Industrial Extended Temperature 4 10/100TX + 2 100FX Unmanaged Single-mode Fiber Switch
Industrial Extended Temperature Conformal Coated Unmanaged Switch	
IUE-500EC	Industrial Extended Temperature Conformal Coated 5 10/100TX Unmanaged Switch
IUE-800EC	Industrial Extended Temperature Conformal Coated 8 10/100TX Unmanaged Switch
IUE-411EC	Industrial Extended Temperature Conformal Coated 4 10/100TX + 1 100FX Unmanaged Multi-mode Fiber Switch
IUE-413EC	Industrial Extended Temperature Conformal Coated 4 10/100TX + 1 100FX Unmanaged Single-mode Fiber Switch
IUE-421EC	Industrial Extended Temperature Conformal Coated 4 10/100TX + 2 100FX Unmanaged Multi-mode Fiber Switch
IUE-423EC	Industrial Extended Temperature Conformal Coated 4 10/100TX + 2 100FX Unmanaged Single-mode Fiber Switch
Industrial Extended Temperature Gigabit Unmanaged Switch	
IUG-500E	Industrial Extended Temperature 5 10/100/1000TX Gigabit Unmanaged Switch
IUG-800E	Industrial Extended Temperature 8 10/100/1000TX Gigabit Unmanaged Switch
Industrial Extended Temperature Redundant Switch	
IRE-500E	Industrial Extended Temperature 5 10/100TX Redundant Switch
IRE-800E	Industrial Extended Temperature 8 10/100TX Redundant Switch
IRE-321E	Industrial Extended Temperature 3 10/100TX + 2 100FX Redundant Multi-mode Fiber Switch
IRE-323E	Industrial Extended Temperature 3 10/100TX + 2 100FX Redundant Single-mode Fiber Switch
Industrial Extended Temperature Conformal Coated Redundant Switch	
IRE-500EC	Industrial Extended Temperature Conformal Coated 5 10/100TX Redundant Switch
IRE-800EC	Industrial Extended Temperature Conformal Coated 8 10/100TX Redundant Switch
IRE-321EC	Industrial Extended Temperature Conformal Coated 3 10/100TX + 2 100FX Redundant Multi-mode Fiber Switch
IRE-323EC	Industrial Extended Temperature Conformal Coated 3 10/100TX + 2 100FX Redundant Single-mode Fiber Switch

Importance of Power Protection

Industrial Ethernet switches are installed in harsh environments and power protection is an important feature. Surges are very common in factory floors commonly known as voltage spikes or current spikes. Power problems may be caused by the following instances in an industrial environment:

- Lightning strikes
- Power outages
- Tripped circuit breakers
- Short circuits
- Power transitions in other large equipment on the same power line
- Malfunctions caused by the power company
- Electromagnetic pulsesInductive spikes

These problems will result in the damage of a device in case the Industrial switch is not surge protected.

Power Protection on Ethernet Direct Industrial Ethernet Switch

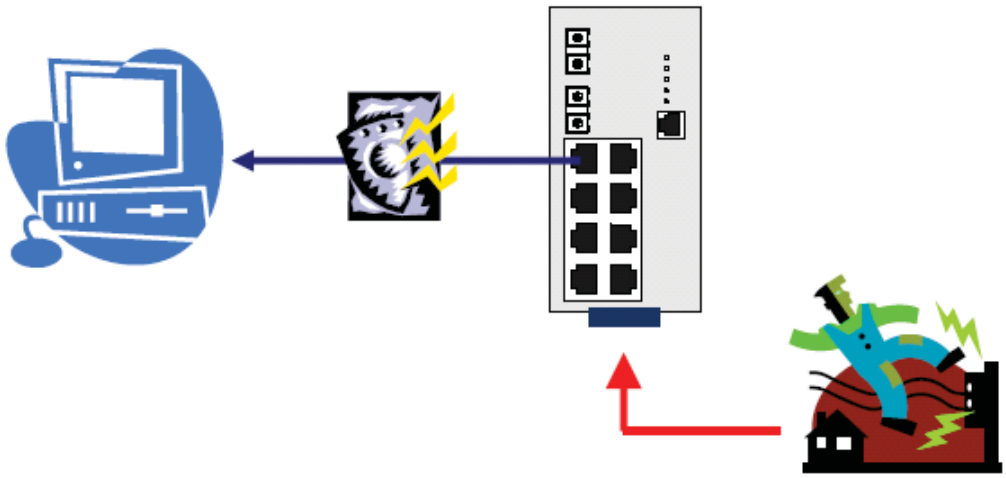
Ethernet Direct offers Industrial Ethernet switches with maximum power protection for long term reliability to ensure uninterruptible, continuous and conditioned power operation to mission critical processes. The power protections are discussed in brief as below.

HIPOT Isolation

What is HIPOT?
"Hipot" is short for high potential (high voltage). A hipot test checks for "good isolation." You do a Hipot test by making sure no current will flow from one point to another point. In the simple case a hipot test takes two conductors that should be isolated and applies a very high voltage between the conductors. The current that flows is watched carefully.

Why is it important in Industrial application?
Hipot isolation makes sure you have good isolation between the parts of a circuit.Having good isolation helps to guarantee the safety and quality of electrical circuits. Hipot tests are helpful in finding nicked or crushed insulation, stray wire strands or braided shielding, conductive or corrosive contaminants around the conductors, terminal spacing problems, and tolerance errors in IDC cables. All of these conditions might cause a device to fail.

Figure 1. Hipot Illustration



Reverse Polarity Protection

Reverse polarity is the opposite of normal polarity.

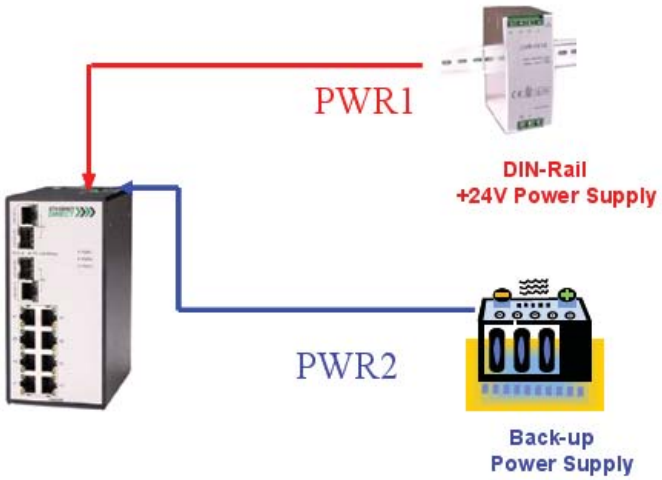
Normal polarity in electronics refers to hooking positive to the positive terminal and the negative to the negative terminal. Reverse polarity would be having the positive hooked up to the negative terminal and the negative to the positive terminal. The theory is that if a reverse polarity fault occurs,the diode will conduct, short the power supply to ground and cause the fuse to blow to protect the device.

Ethernet Direct switches are designed with reverse polarity protection and with this specification, even the user connects the wrong polarity with power input, the switch can still work well in perfect condition to avoid power or switch failure.

Redundant Power Input

Redundancy is of primary importance in industrial applications to ensure non-stop operation. In terms of power redundancy, Ethernet Direct switches come with redundant power input wherein the switch can be connected with two stand alone power resources. If for some reason there is a failure in the first power, the other one will seamlessly take over to prevent the loss of power.

Figure 2. Redundant Power



What is EMS? EFT & ESD protection

In order to assure safety and quality, Ethernet Direct products are designed to meet the tolerance of circuits and components to all sources of interfering electromagnetic energy such as electromagnetic compatibility (EMC), electromagnetic interference (EMI) and electromagnetic susceptibility (EMS).
These test parameters ensure that even the Industrial switch is installed in the harsh environments with electromagnetic waves, the switch will still work in perfect condition. Electromagnetic susceptibility covers important parameters known as electro static discharge (ESD) and electrical fast transient (EFT) which is important when talking about power protection.

Electromagnetic waves are common in industrial applications and a non-ESD and non-EFT protected device will result to immediate device failure causing network downtime. Various types of power protection are carried out in Ethernet Direct products to make it suitable for mission critical applications.

Power Test Compliances in Ethernet Direct Switches

Tests Standard No.	Tests Specification Level
1.ESD IEC/EN 61000-4-2	8KV discharge 6KV contact discharge
	6KV HCP discharge 6KV VCP discharge
2.RS IEC/EN 61000-4-3	80 MHZ to 1000MHZ 10V/m(rms), 1KHZ, 80% AM modulated
3.EFT/Burst IEC/EN 61000-4-4	4KV(peak) 5/50ns Tr/Th 5KHZ Repetition Freq.
	3KV(peak) 5/50ns Tr/Th 5KHZ Repetition Freq.
4.Surges IEC/EN 61000-4-5	1KV(5P/5N) 1.2/50(8/20) Tr/Th us
	2KV(5P/5N) 1.2/50(8/20) Tr/Th us
5.Injected Current IEC/EN 61000-4-6	0.15 MHZ to 80 MHZ 3V(rms), 1KMZ 80% AM Modulated 150Ω source impedaance
	0.15 MHZ to 80 MHZ 3V(rms), 1KMZ 80% AM Modulated 150Ω source impedaance
	0.15 MHZ to 80 MHZ 3V(rms), 1KMZ 80% AM Modulated 150Ω source impedaance
6.Power Frequency Magneetic Field IEC/EN 61000-4-11	50 Hz, 30A/m
7.Volt. Interruptions Volt. Dips UEC/EN 61000-4-11	Voltage dip >95% Voltage dip 30% interruption >95%

Conclusion

The above mentioned guides to power system protection and power saving technology eliminate the risk in factory floors and also on how to create a safe environment. Issues such as high voltage transmission network, low voltage networks, overload, earth fault, back-up and others can be prevented. By deploying a safe device, any industrial application will be operating stably and for this reason, Ethernet Direct pioneers in offering the different power protection schemes in industrial switches.

About Ethernet Direct Corporation

Ethernet Direct brings a control system engineering perspective to networking technology. The principals of Ethernet Direct come from process-control and PLC system backgrounds.

The Global Ethernet Direct team covers operations from Product know-how, design implementation, quality assurance, manufacturing, logistics, sales, marketing & technical support. We are well-positioned to fulfill customers' needs and markets' demands by providing a great variety of tailor-made products and services. When you work with us, you will experience confidence and dependability. By choosing Ethernet Direct, you have chosen excellence & long-term commitment.

Our corporate headquarter is located in Taiwan with Ethernet Direct Partners across United States, Canada, Asia Pacific, Latin America, Europe, and Middle East.