



A small change for
Trouble-free power &
connectivity for medical
devices

Medical devices are the product of high-precision, advanced manufacturing and often make use of the very latest technology. From sensors and spectral scanning to various radiation appliances, they invariably reflect the cutting edge of manufacturing.

IN ADDITION, THE SAFETY REGULATIONS THAT MEDICAL DEVICES MUST ADHERE TO ARE AMONG THE MOST STRINGENT IN ALL MANUFACTURING INDUSTRIES. AS A RESULT, THE RIGOROUS ELECTROMAGNETIC STANDARDS, POWER STANDARDS AND MATERIALS STANDARDS FORMULATED TO ENSURE PEOPLE'S SAFETY, HEALTH AND WELLBEING ARE UNPARALLELED IN ANY OTHER INDUSTRY.

Recently emerged IoT technology has also been adopted in the medical device industry, transforming many medical devices into brand new devices based on Ethernet networks, the Internet and even mobile networks (4G). Used in conjunction with smart medical systems such as electronic medical records, mobile ward rounds and consultation systems, and coupled with big data analysis, this technology has become a prevailing trend in the IT/Internet field.

Whether they make use of Ethernet or the Internet, these new medical devices constitute a complete IT system comprising operational processes and functions such as data collection, data transmission, data storage, and data analysis. As a result, medical devices have the same basic prerequisites as general IoT devices — network access and power.

Networks are naturally indispensable for medical devices, as they are used to transmit data back to servers for analysis. The various types of medical devices adopt different approaches, though in general they are based on WiFi and cabled networks.

When WiFi is used, the wireless AP works in wireless network card/client mode to better connect to the network. The benefit of this approach is that it saves on cabling, although one potential disadvantage is unstable WiFi signals.

When a cabled network is used, the switch becomes the support for the entire system. Stable transmission is most desirable in the vital field of medicine.



PoE and medical devices

The best match between power and network convergence

However, whether a WiFi or a switch is used, these medical device IT systems require a power supply. Power supply and cabling have become the most problematic aspects in the design of medical devices.

Power supply — strong current (220V or 110V) is most commonly used in everyday appliances. However, for safety reasons medical devices generally adopt the 48V/12V power supply standard. Consequently, many appliances in medical devices require a 220V/110V to 48V/12V transformer adapter (also known as a power transformer). On the one hand, such adapters have no uniform standards in terms of size, model, and power, which can cause major problems in their installation, deployment, and maintenance. On the other hand, they also increase the single point of failure for devices, which is undesirable for the entire medical device system.

Cabling — medical devices include an ever increasing quantity of mobile equipment, including wheeled stretchers, trolleys, and mobile monitors, which have no fixed place of installation. Lengthening the cable is the only option when the existing cable is too short for the device to be moved around, but this entails considerable safety hazards, as serial power strip connections are the biggest cause of tripping and short circuits. Exposed power cords are unacceptable in the medical industry.

For these reasons, the recent emergence of PoE power supply technology provides the best solution for medical devices and solves the tricky challenge of 2+1 power supply.

Transmission via cabled network

PoE ensures reliable data transmission, since it is based on Ethernet technology. It enables the various sensors, collectors, and processors installed in medical device systems to accurately transmit data back to data centers via the cabled network.

Power supply

PoE provides a stable power supply to terminals, since it is based on weak direct current technology of 48V or less. At the same time, weak current is an answer to the safety hazard posed by strong current. Furthermore, the power supplied by PoE technology, from 15W/port with PoE to the current standard of 30W/port with PoE+, provides sufficiently strong power for most medical device systems.

Advanced PoE relay power supply

As mentioned above, apparatus such as WiFi, switches, and sensors in medical device systems also require a power supply and network connections. Traditionally, this problem could only be solved by adding a cabled network or power supply. However, the need for an excessive number of network cables and power cords is obviously unrealistic for deployment in the medical industry. A PoE cable receives the PoE power supply and data, and transfers them to the medical device system.



For this type of system and requirement, NETGEAR specializes in providing unique PoE relay power supply technology and products. At one end, a high-power PoE switch of 15W or 30W connects from a data center to a medical device via a network cable. At the other end, a NETGEAR PoE relay switch is added to the medical device to re-distribute the PoE power supply to the various apparatus in the medical device, while also providing a data connection.

Due to the combination of a high-power PoE switch and a smaller PoE relay power switch, medical devices no longer require a multitude of power and network interfaces. One simple PoE network interface fully meets all these application needs. The benefits have never been so great — because of the application of PoE technology, medical devices are no longer limited by their power interface. In order to export medical devices to countries around the world, the power interface must be reconfigured into all kinds of formats, but the PoE network interface is the only internationally adopted standard... meaning power supply is no longer a concern.

THE END

