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Reading the Road:

License Plate Readers and their Challenges

2017

Intelligent transportation systems(ITS) is the city or state's use of technology to help solve their complex challenges. A growing concern for both is knowing how many cars are on their roads at any given time. Even more important is the need to map out the flow of traffic and adjust traffic lights accordingly. One of the most popular methods of collecting this information is by utilizing License Plate Readers(LPR) deployed throughout cities. So far, around 14 states have issued legislations around the deployment and storage of LPRs and their information collected. It is also not regulated by most state ITS chapters, so it is up to the cities how to deploy the technology and use the information they have gathered. The captured data from the LPR can be utilized for more than just traffic flow mapping. Many cities are using this information to look for outdated vehicle registration or even warrants. Municipalities are not the only ones adopting this emerging technology. Parking garages are using it to track how long a particular car was in their lot; this information is then used to advise changes to price. Toll roads are using them to know who to charge if a car did not have a registered transponder or tag. Even some banks are collecting the data to track and locate cars that are needing to be repossessed.

The amount of license plate readers deployed is increasing, and so is the number of creative ways to utilize the technology. Traditionally, the license plate reader would attach to a light post at an intersection and be connected to the city's traffic

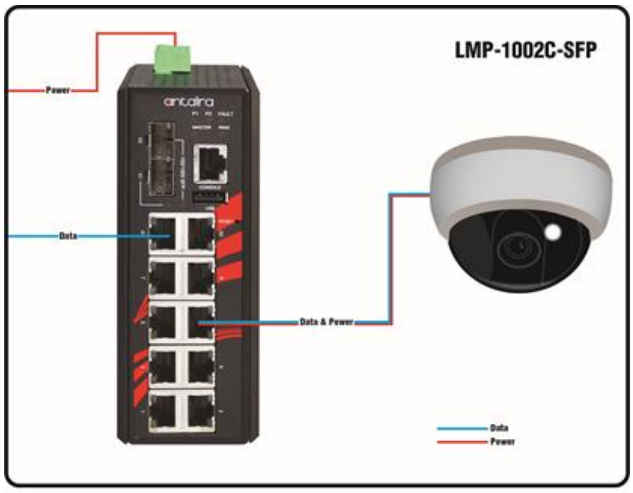
LPR mounted on a Police car

control network. One of the most common deployment methods today is placing license plate readers into police vehicles or parking monitors to inspect license plates when driving around. The license plate reader can scan the plate, reference the information against a database and report any errors much faster than someone having to enter the information manually. The increased efficiency of scanning a license plate for any errors leads to a larger amount of tickets issued. The revenue from the tickets can quickly cover the cost of deploying the License Plate Readers. Another typical deployment method is a mobile drop system. These systems can be in the form of a deployable enclosure or a portable trailer. Many mobile drop systems are battery powered with the option of a solar generator for longer deployments. Solar power allows for a system to be left in a location discreetly and stay operational for several hours or even days without being noticed.

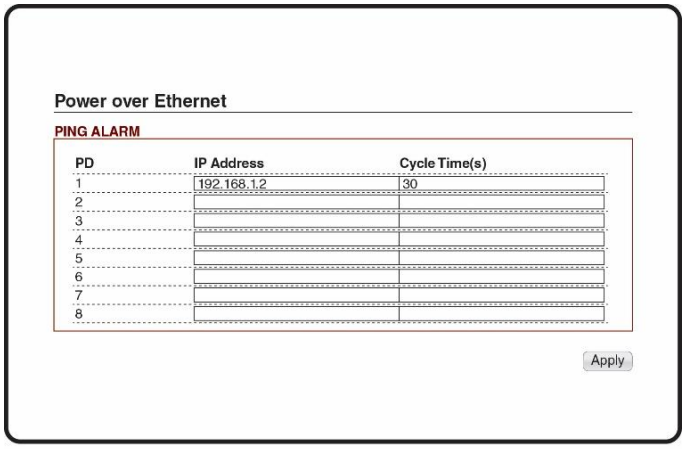
A major factor for how good a License Plate Reader can be is the network used to backhaul the information and monitoring device power. The environmental conditions where these units are deployed forces industrial grade networking equipment to be used. There are three common ways to collect backhauled data to a central database. On a permanent installation, the best option is sending the information back using an Ethernet network. These networks can either be constructed of copper or fiber optics to provide a stable high-bandwidth solution. If achieving a hardwired connection is difficult, or we are deploying a mobile application, WiFi is a standard solution. Placing multiple access points around a city will allow the cameras to be moved around as needed. WiFi solutions can have issues with latency if the network is not optimized. Bringing the info back with a cellular connection is growing in popularity, but the recurring cost can add up over time.

To simplify installations and give the ability to monitor the status of the LPR, many

manufacturers have started incorporating Power over Ethernet(PoE) on their products. PoE allows one cable to provide both the data and power needed. Commonly, managed PoE switches are used to supply this PoE connectivity. Managed switches are defined by their user interfaces that allow remote access to the switch's current status and controls some of its functionality. If an Antaira PoE managed switch, like the LMP-1002C-SFP (10-Port Industrial PoE+ Gigabit Managed Ethernet Switch), is used to provide the PoE connectivity, we gain the ability to both monitor and control the power for the LPR. Logging into the management interface of the switch can quickly show if the LPR is drawing power. However, sometimes, a unit can be drawing power but is not behaving as it should. One of the first solutions to this issue is to power cycle the unit. Through the management interface, we can easily power cycle the unit by disabling and reenabling the PoE function of the port attached to the LPR. A more convenient solution would be if the switch were able to power cycle the LPR automatically. Utilizing Antaira's PoE keep alive function, the switch can ping the LPR on a settable time interval, and if three consecutive pings drop, the switch will automatically power cycle the port attached to the LPR.

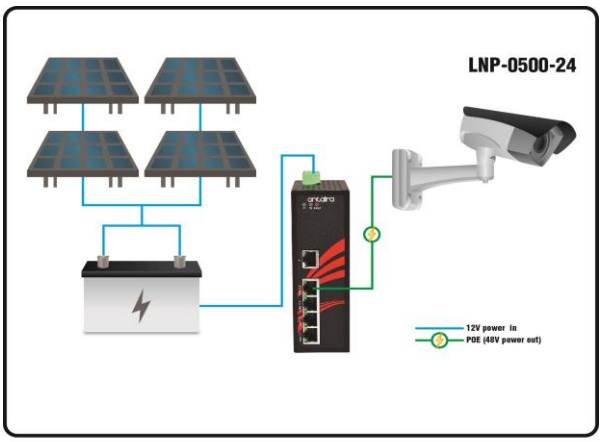


Data and power combine to provide PoE



PoE keep alive function set up to ping 192.168.1.2 on 30 sec intervals

The LPR is not the only device that has the option to be powered by PoE. Many times, WiFi products or cellular modems can also benefit from this technology. Using WiFi and cellular to backhaul information is a standard solution for mobile applications. Using PoE however with mobile applications can face some significant hurdles. Standard PoE uses 48-volts to power devices, most of the time this will force a PoE supplying device to require a 48-volt input. The challenge then is finding a way to provide 48-volts in mobile environments where traditionally only 12-volts is located. An option is using an Antaira PoE switch with the "-24" functionality, like the LNP-0500-24(5-Port Industrial PoE+ Unmanaged Ethernet Switch, 12~36VDC input). These units will have an internal DC-DC converter that can use the commonly found 12-volt input and boost it to the 48-volt standard needed for PoE.



12 volt input boosted to provide PoE connectivity

LPRs are going to grow in popularity with their increased deployment by municipalities nationwide. The collected information will provide a complete comprehension of traffic conditions and will allow cities and states to develop more robust ITS solutions. As more ITS solutions are deployed, connectivity challenges are going to present themselves. Antaira Technologies will always address these problems and provide cutting edge solutions.

About Antaira Technologies:

Antaira Technologies is a leading developer and manufacturer that provides high-quality industrial networking and communication product solutions. Since 2005, Antaira has offered a full spectrum of product lines that feature reliable Ethernet infrastructures, extended temperature tolerance, and rugged enclosure designs. Our product lines range from industrial Ethernet switches, industrial wireless devices, Ethernet media converters, and serial communication devices. Our vast professional experience allows us to deploy a wide array of products worldwide in mission-critical applications across various markets, such as, automation, transportation, security, oil & gas, power/utility, and medical.