

Electric Vehicle Charging Stations and Digital Signage: Charging More than Just Vehicles

By Todd Mares, Director of Emerging Technologies, Peerless-AV

Digital signage can be used in a variety of applications and often plays a key role in effective communication. Common applications for digital signage use include retail, hospitality, transportation, education, corporate, and entertainment venues. However, digital signage has been expanding in use, with solutions appearing in new venues such as charging stations for electric vehicles.

The need for public charging stations is rapidly growing in tandem with the demand for plug-in electric vehicles (PEVs). Digital signage is also growing in tandem with technological advances and changes in communication styles and processes. The use of such a unique combination of technologies opens many doors for beneficial returns to all parties involved, including content providers, advertisers, manufacturers, and end users.



The installation of charging stations (whether at a premium retail center, grocery store, parking garage, entertainment venue, or airport) has various benefits including:

- Brand building, customer attraction, and retention.
- Electric vehicle (EV) charging stations give businesses a unique way to differentiate themselves from competitors, and enhance and promote a positive, environmentally friendly brand image.
- Digital or static advertising opportunities on signage are possible.
- Content options are nearly endless. Each time EV owners charge their vehicles, it becomes an opportunity to advertise to those drivers.
- Advertising offers the charging station company the ability to offer the charging station for free, while generating money directly from advertising.
- Reduce environmental footprint and save energy.



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Background Info on Electric Vehicles

Electric vehicles (EVs) have been around for more than 100 years, with the first “small-scale electric cars” invented in 1828. It wasn’t until the 1890s that the first successful EV was created, which sparked an interest in both consumers and automakers.

Historically, EVs were not widely adopted by consumers due to their short driving time and long charging sessions compared to conventional gasoline or diesel cars. However, today that is no longer the case with battery charging time being of little concern for a plug-in electric vehicle (PEV) owner.

The demand for PEVs is growing rapidly and with that demand also comes the need for charging stations.

According to Portland General Electric (PGE), about one-third of the country’s greenhouse gas emissions come from transportation, and 60 percent of that is from vehicle use. Charging stations significantly aid in reducing carbon emissions and the more public stations installed, the more interested non-EV drivers will be to join the movement.

Taking Charging Stations to a New Level

Digital displays enclosed within an outdoor charging station kiosk offer many benefits to the charging station manufacturer, signage manufacturer, advertisers, and end users as compared to traditional charging stations equipped with only backlit static signage.

The benefit is that the digital signage messaging options are limitless. When enclosed in a charging station kiosk, the medium can be used to generate revenue through advertising, provide wayfinding and personalized guest services, provide corporate information for employees, and more. A constant stream of fresh content can achieve high quality communications to the specific target audience.

Charging stations are the perfect place to advertise to each driver who pulls up to charge. A recent study found that 63 percent of adults report that digital signage advertising catches their attention more than any other method of advertising, and 44 percent said they paid attention to digital signage advertising more than any other method of advertising.¹ Whether the advertisement is for a partner EV company, stores inside the premium retail center, or for the charging station company itself, digital signage offers more advertisement space and potential for increased revenue.

The true takeaway is that the opportunities for functionality and benefits for all parties involved are truly limitless. Digital signage can certainly be used to generate revenue through advertising, but moreover, supports what retailers can and should offer shoppers in terms of a personalized guest service experience, from the moment they step out of their cars. From customized wayfinding, to exclusive promo codes displayed on digital signage enclosed in charging stations, companies can create a 360-degree brand experience, allowing customers to interact with brands anywhere, at any time. A constant stream of fresh content, on-demand is the expectation of customers and it is through digital signage that retailers can truly accomplish this.

Kiosk and Display Considerations

Before investing in an outdoor kiosk and display for a charging station, there are a number of factors to consider. These are related to the kiosk and display.



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¹ “Digital Out-of-Home Media Awareness & Attitude Study.” Rich Media Technologies. See-Saw Networks, Inc., 2007. Web. 15 Sept. 2015. <<http://www.richmediatechnologies.com/uploads/articles/pdf/Outdoor%20Effectivness.pdf>>

PEV Fundamentals

The two types of PEVs are EVs and plug-in hybrid electric vehicles (PHEVs).

All EVs, also referred to as battery-electric vehicles, run solely on batteries, which store electrical energy that powers the motor and produces no tailpipe emissions. Plugging the vehicle into an electric power source charges the batteries. Also, EVs have the ability to charge by regenerative braking, which means the electric drive motors are used as generators and return the kinetic energy normally lost when braking to electricity for the electric supply system to run off of.

Plug-in hybrid electric vehicles (PHEVs), also referred to as extended range electric vehicles, differ from EVs as they use both batteries and fuel. The batteries power the electric motor and the fuel powers the internal combustion engine. These types of vehicles are similar to EVs because they can be plugged into an electrical source. However, the battery life for PHEVs is normally shorter.



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Kiosk considerations:

- Weather ratings are one of the most important considerations when choosing a kiosk. The best way to determine a kiosk's ability to withstand weather conditions is by referring to the Ingress Protection (IP) rating. The IP code classifies and rates the degree of protection provided against the ingress of dust and water. An IP68 rating is the standard recommendation for this type of application.
- Ability to update content and monitor the status of the kiosk remotely via Wi-Fi or landlines.
- Configurable email alarms notifying the charging station company of any issues with the kiosk, e.g. power is down, an internal component has failed, a door is open, a concerning enclosure temperature, etc.
- Circulation fans to ensure proper operating temperature for the internal electronics.
- Lockable doors for security and kill switches outside the enclosure to shut off power during an emergency.
- Ability to integrate a display, media players, speakers, and more to provide a complete self-service experience for the consumers charging their PEVs.
- Pre-assembled design to simplify on-the-job installation, eliminating the need for on-site engineers for assembly, thereby reducing installation costs.

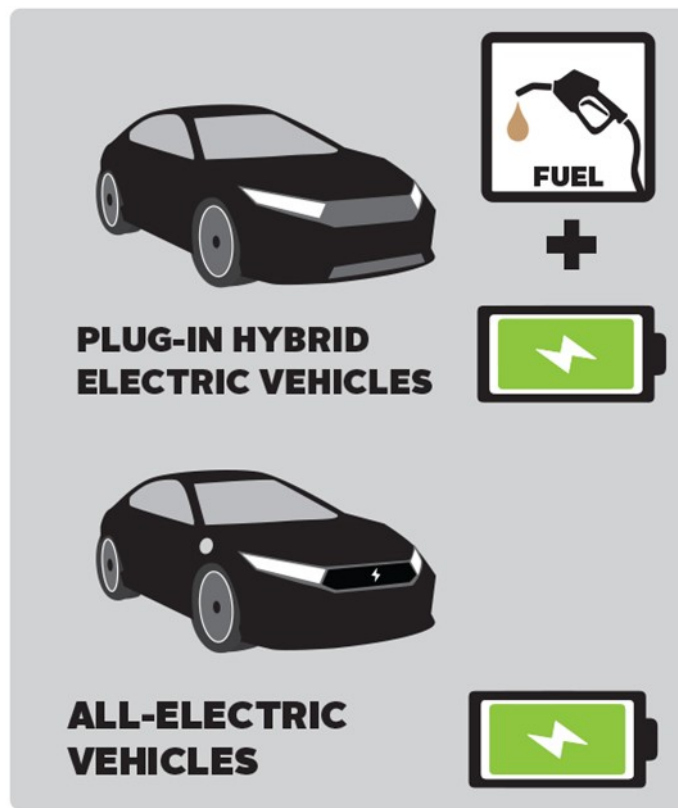
Outdoor display considerations:

- Ability to withstand harsh outdoor elements, season changes, and extreme temperature differentials (see previous explanation of IP ratings).
- Daylight-readable, full HD, 1080p resolution for a bright, crisp picture when installed in outdoor environments.
- An LED backlight system, which ensures better uniformity of illumination and creates less heat.
- Designed for direct solar loads and temperatures ranging from -40°F to 140°F.
- Fully sealed design to prevent condensation from forming inside the display glass.
- Cooling, as air conditioners will need upkeep, require maintenance, and consume significant power.
- Ambient light sensors to automatically and gradually adjust a screen's brightness at different times, based on surrounding conditions.
- Breakage-resistant safety glass to contend with vandalism.

The Solution

Peerless-AV® helped create custom Volta charging stations. The station design includes an outdoor daylight-readable display, a backlit poster box, a media player, a power meter, and a cellular modem. The cellular modem allows for real time content updates and power consumption records. One of the largest challenges retailers face is getting customers' attention. An interactive display helps retailers connect with customers in a meaningful way.

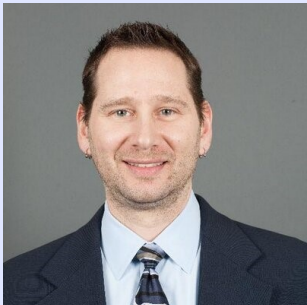
Charging Fundamentals



EV charging stations can be installed just about anywhere electricity can be run – homes, apartment complexes, corporate campuses, college campuses, shopping centers, parking garages, etc. But before installing and using a charging station, it's important to understand the basics of the equipment.

There are different types of electric vehicle supply equipment based on communication capabilities and the time it takes to actually charge the vehicle itself. This equipment takes electrical energy from the electricity source it is plugged into, such as the electrical outlets at a shopping center parking garage. In order to guarantee that a safe flow of

electricity is continuously supplied to the various brands of PEVs charging, the supply equipment has to be able to communicate effectively with the PEV.



Todd Mares is the Application Field Engineer for the Emerging Technologies Division of Peerless-AV.

Peerless-AV Company Profile

PRI welcomes Peerless-AV as a member firm and is pleased to provide this profile to *Journal* readers.

Peerless-AV, a Peerless Industries, Inc. company, is a leading designer, manufacturer, and distributor of audiovisual solutions. From its award-winning mounts and wireless audio systems to indoor/outdoor kiosks and the industry's first fully sealed outdoor displays, Peerless-AV aims to Get It Right™ by fulfilling both integrators' needs for ease of installation and service, and end users' dreams in residential and commercial applications.

Based in Aurora, IL, Peerless-AV manufactures over 3,600 products that serve original equipment manufacturers, commercial integrators, and consumer retailers in 22 vertical markets through direct sales representatives and authorized distribution.



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