

Intelligent traffic monitoring via 4G off grid power

Meeting ITS power demands with an efficient alternative power source

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Highway authorities around the world are pushing the green agenda and with it comes pressure to limit or reduce the installation of power cables adjacent to new or existing highways. These authorities are also deploying technology to collect increasing amounts of data to plan road and bridge maintenance, optimize traffic movement, and improve road safety. They employ devices such as traffic counters, vehicle weighing units, vibration sensors, road side units (RSU's), and CCTV.

So the challenge is to bring power and communications where it is needed.

The options available

Each of the options for bringing an alternative source of power to a roadside site means that expensive trenching for cable installation and disruptive roadworks is avoided. The options are generally limited to the following:

- Solar-power – with battery storage
- Fuel cells
- Hybrid systems – combining wind and solar generation with battery storage

Of these, solar powered panels with adequately sized battery storage offer an excellent solution for powering roadside devices where the level of solar irradiation is relatively sufficient and consistent throughout

Right: The ISP2 is powered by hybrid solar and wind generation technologies

all seasons. For climates where the level of solar irradiation is not consistent, the modelling and sizing of the array becomes critical. Typically, in Northern Europe this translates into solar panel arrays yielding much less power per meter squared than many places in the world – meaning large arrays to do the same job.

Fuel cells are highly efficient but are costly and pose difficulties in both mobility and storage. They are also generally not acceptable for roadside installations.

Like solar powered arrays, hybrid systems – combining wind and solar generation with battery storage offer an excellent solution for powering roadside devices. The added benefit of the hybrid system is that it has the inherent ability to generate power and charge the batteries when there is wind present at the site, complimenting the solar power generation. This helps to maintain a more reasonably sized solar array, and offers some resilience.

Dublin Port Tunnel

Multisys, an Irish company specializing in the provision of ITS solutions, approached Airsynergy to power their integrated traffic monitoring and profiling solution for the Dublin Port Tunnel and Toll Plaza.

Airsynergy is an Irish company specializing in the design and

120W

The maximum continuous power generated by the ISP2



compatible with all the major ITS and security platforms'.

System features

Equipped with these technologies, the system provides low resolution live video stream to the Motor Traffic Control Centre (MTCC) over a cyber secure 4G network connection and streams high-resolution images on demand e.g. during an incident/event.

Capable of local edge recording, it can be rapidly deployed with minimal disruption to MTCC or motorway operation, it offers cloud-based archiving for the purpose of increased system redundancy and resilience. Additionally, the solution is capable of hosting edge video traffic management analytics, has a continuous load of less than 35W total – meaning zero downtime in the harshest environments - while the fully independent standalone CCTV is capable of local recording regardless of the integrity of the 4G connection at any time. Use cases for the system include blackspot motorway junctions, temporary highway works and road works monitoring as well as entry/exit/road monitoring of events.

Multiple and varied benefits

First of all, there is the time savings of deploying an ISP2 at a site compared to installing of power/fiber cables and the difficulty with interacting with utilities.

Then there is the cost. In many cases, it is cost prohibitive to pull power/fiber cabling for fixed or temporary installations. This can be evaluated on a case-by-case basis, and will depend on the nearest connection point to power and communications infrastructure locally.

Being a fully standalone system with independent recording and VMS system is also an attractive feature as is the fact that all units can be monitored and configured remotely minimizing disruption caused by highway traffic management measures during maintenance or support of the unit.

The extensive intelligent video analytics capability can be tailored to suit particular site environment conditions or the system performance brief. ■

manufacturing of off grid power products for critical applications, Airsynergy deployed its' Independent Smart Pole (ISP).

ERTO (Egis Road and Tunnel Operations) who manage Dublin Port Tunnel on behalf of Transport Infrastructure Ireland facilitated the ITS development works of the mobile pole along with trialling and deployment of pilot units. A number of poles are now being deployed to key infrastructure locations.

The ISP is a hybrid wind and solar power system with a built-in rechargeable energy source (over 7kWhr's of Lithium Iron Phosphate batteries). It is a robust, certified (UL and CE) off-grid power platform. It uses leading edge technology combined in an integrated system which offers 24/7 power at different levels (40/80/120W) continuously.

It has been designed to address the problems which are encountered by highway and law enforcement authorities and is installed at locations in the USA, Germany, UK and Ireland.

Airsynergy's award winning ISP2 – an off-grid hybrid power generation and storage solution, is a low maintenance and remotely monitored robust system, designed to UL6142 specifications. The ISP2 was supplied complete with above ground temporary foundations – an option available for each product in the range.

The ITS system from Multisys consists of cameras interchanged with radars, sensors, automatic license plate recognition (ALPR) cameras for general surveillance, automatic incident reporting – wrong way, pedestrian, low/high speed and congestion – and historical traffic data including vehicle counting, vehicle classification, traffic speed and traffic occupancy.

The system comes with local storage, wireless communications and power converters. It is also

Right: The Dublin Port Tunnel and Toll Plaza is now monitored by Multisys' ITS system

