Solar Power Control Cabinet

by Unipart Rail

Stand-alone Solar Generated Power Solution for Rail Infrastructure

PowerU

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A green alternative to standard trackside power, supporting carbon reduction and reducing civils costs

Bringing power to track-side assets can be prohibitively expensive - excavations, troughing, cable runs and installation costs all mount up. SPCC by Unipart Rail is the innovative solution for a variety of low power assets, such as User Worked Level Crossings and Lighting.

Introducing the Solar Power Control Cabinet (SPCC)

The SPCC has been developed to provide a local regenerative power solution for low power applications where there is a need for carbon reduction, or where the required power infrastructure isn't within economic distance to connect to local power installations.

Network Rail challenged Unipart Rail to develop a local power solution to support the VaMoS user worked crossing installation. This was to be located in a challenging site with no power supply:

- Solar power harvesting
- 50W load at 24Vdc
- 530aH battery bank with storage of up to 12.7kWh
- 9-day power supply
- Methanol Power Cell backup
- Remote condition monitoring compatible with Network Rail's RADAR (Intelligent Infrastructure) system

Back-up Power Generation

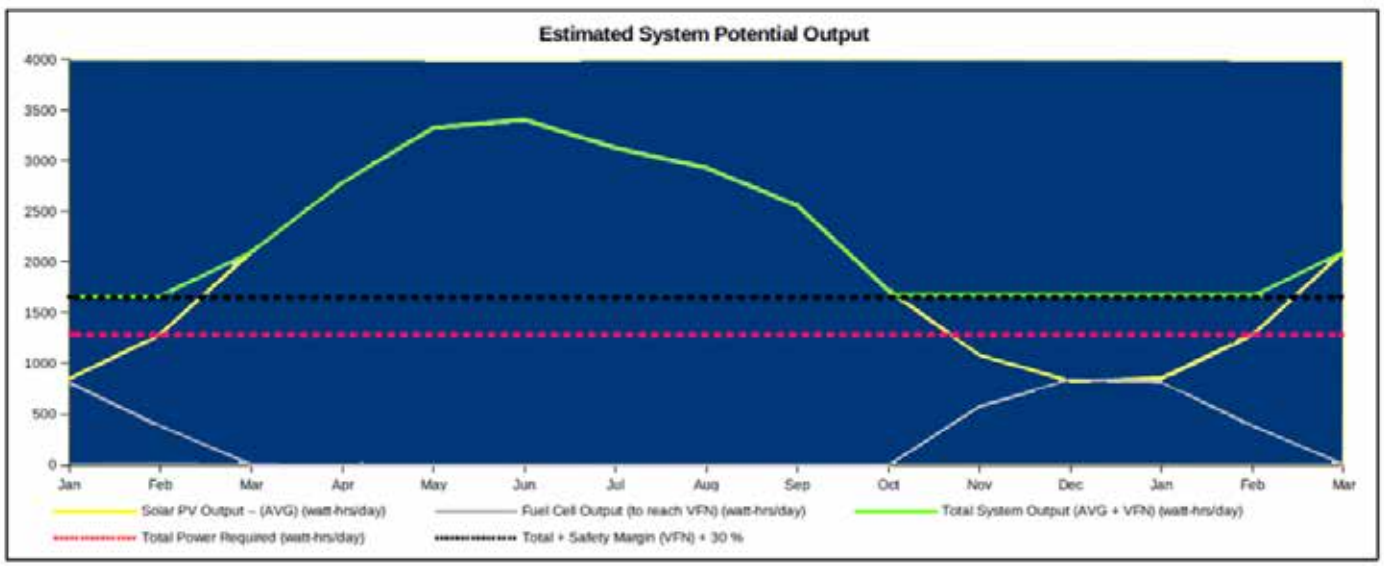
Because photovoltaic power generation fluctuates across the year, it was necessary to include the Methanol fuel cell back-up that would automatically cut-in to keep power at the required levels.

Remote Condition Monitoring

Remote condition monitoring of the installation is undertaken through two separate systems (as required by Network Rail). One monitors the photovoltaic and battery array and the second monitors the fuel cell and stored energy. This enables any off-target performance to be identified and rectified before it becomes an issue.

Client : Network Rail	Meteo Data From Site:	Solar PV Module Orientation	Angle of Tilt	Solar PV Array (KWp)
Project : VAMOS Acle Marshes (Single Track) – Modified – (inc quote)	Mid Norfolk	South	60°	0.73

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Solar PV Output – (AVG)	(watt-hrs/day)	851	1285	2101	2785	3325	3404	3127	2929	2557	1716	1082	822	851	1285	2101
Fuel Cell Output (to reach VFN)	(watt-hrs/day)	811	378	0	0	0	0	0	0	0	0	581	841	811	378	0
Total System Output (AVG + VFN)	(watt-hrs/day)	1663	1663	2101	2785	3325	3404	3127	2929	2557	1716	1663	1663	1663	1663	2101
Total Power Required	(watt-hrs/day)	1279	1279	1279	1279	1279	1279	1279	1279	1279	1279	1279	1279	1279	1279	1279
Total + Safety Margin (VFN)	+ 30 %	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
Fuel Cell Output Required (to reach AVG)	(watt-hrs/day)	428	0	0	0	0	0	0	0	0	0	197	457	428	0	0



The system design includes a Safety Margin of 30% above the average Meteorological weather data.
(as sampled over a 10 year period for the specific site location of the installation).

The Equipment

Mounted in two GRP location cases on standard concrete bases, the equipment is fully self-contained. The battery array is in one location case, and the fuel cell in the second.

Fully customisable architecture for a complete installation

Being supplied as a complete kit, the SPCC can be installed and connected with the minimum of disruption. The use of standard components makes it simple to install and commission.

Higher energy requirements can be accommodated with larger battery arrays and solar panels.

About Unipart

The Unipart Group is a leading UK manufacturer, full service logistics provider and consultant in operational excellence. Operating across a range of market sectors, including automotive, manufacturing, mobile telecoms, rail, retail and technology, Unipart offers a breadth of services to a wide range of blue chip clients internationally.

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