Eleonora Denna, Product Marketing Manager for Environmental Solution Business EMEA, Omron, explains to PES about their commitment to the PV business. Omron are in many markets world-wide with their inverters. The company moves with the times, adjusting to new demands. The Omron inverter was chosen for the Antalya Football Arena. It is an exciting time for them…

**Leading inverters**

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**PES: Welcome to PES Solar/PV magazine. Thanks for talking with us. Would you like to begin by explaining a little about the background of your organisation and how you currently serve the solar/PV industry?**

**Eleonora Denna:** Thanks for this question, which gives me the opportunity to give you a picture of Omron, a worldwide market leader for automation components, with revenues of 6.1 billion euros and offices all over the world. The company is strongly committed to research and innovation, investing 6% of the revenue every year in R&D. Omron has been producing and selling photovoltaic inverters since 1994 and over the twenty years has sold more than one million.

We are a market leader in the solar business in Japan, where the residential sector is continuing a positive development. Omron Environmental Solution Business in Europe, with headquarters in the Netherlands, is in charge of Omron PV business in the EMEA Market (Europe, Middle East, and Africa), with the main focus in Italy, Spain and emerging solar markets, such as Benelux, Ukraine, Poland, Turkey, Lebanon and South Africa.

**PES: Is solar/PV a growing business area for Omron? How are you capitalising on this growth?**

**ED:** Omron is strongly committed to the PV business, which has different priorities from country to country. Italy and Spain, for example, are mature markets where O&M opportunities are quite strong and new solar installations have tailed off. In these countries “revamping” is a strategic issue and Omron, as one of the inverter producers who are still on the market, assists those plants where the other inverter manufacturers failed.

In other countries the solar business is growing, with new, big plants. An example of this is Turkey, where the total annual insolation time is 2,737 hours, (a total of 7.5 hours per day) and the grid is capable of supporting solar PV growth with no problem. The Omron inverter was chosen for Antalya Football Arena, one of the highest capacity solar systems on a Stadium, aiming to make the Guinness Records.

**PES: Please tell us about the importance of Omron’s industrial automation in becoming a market leader.**

**ED:** Industrial Automation is our main expertise and is the base of our success in the PV sector. As an example, at the top Omron’s experience, designing sensing technology for different sectors is industrial automation. This was crucial when developing AICOT controller (Anti Islanding Control Technology). OMRON engineers used a simulation environment to run preliminary tests, reducing time spent on
AICOT has been adopted as Japan’s official standard to prevent “Islanding”, the condition in which solar power generation systems continue to generate electricity even when electric power supplied by the grid is interrupted.

Thanks to AICOT, Omron inverter KP100L is compliant with the international standard IEC 62116, which defines test procedures for islanding prevention measures and is a requirement for Certificate NRS-097-2-1, needed in South Africa.

PES: What are the advantages of Omron’s industrial automation expertise for the customer?

ED: We have a lot of experience giving in the field support to our customers. This is a must in industrial automation and now the photovoltaics sector also needs special support, mostly in emerging solar markets. This is a must for several reasons, including more economically, convenient PV installations and less bureaucracy.

We experienced this in a plant in Lebanon, where frequent electricity cuts make any photovoltaic installations more complex. In this instance Omron’s technical support was very important in adapting the KP100L Inverter to the quality of the grid and its frequent electricity cuts.

Other examples come from photovoltaic installations in developing countries; top of the list is South Africa, where not even 1 kWh must reach the grid. In this case our local field application engineer assisted our customer by adapting the existing web based PV monitoring program, the Omron PVremote Pro which is based on Omron PLC (Programmable Logic Controller) CJ2M, to also reduce output power from Omron PV inverters by sending opportune command when PV production overtook local load consumption, constantly measured by Omron Power Monitor Device KM50.

Therefore it is possible to design a Zero kWh PV system by using 100% Omron components and with the support of our field application engineers, thus maximising the suitability of PV plant installation.

“We have a lot of experience giving in the field support to our customers. This is a must in industrial automation and now the photovoltaics sector also needs special support, mostly in emerging solar markets”

Eleonora Denna
ASK THE EXPERTS

PES: What technology is used in your inverter?

ED: The main strength of our inverter is the ZCC circuit (Zigzag Connected Chopper), thanks to which the Omron Inverter is capable of maintaining the negative pole of the PV array grounded without the use of an integrated transformer. This circuit topology prevents PID (Performance Induced Degradation): In recent years, a significant increase of PID occurrences has been observed in the field, especially for panels installed in tough climatic environments with high humidity, high temperature or close proximity to coastlines and sea water.

Inverters equipped with Zigzag Connected Chopper (ZCC) technology, in the DC/AC conversion module, are capable of maintaining the negative pole of the PV array grounded without the use of an integrated transformer.

We also have a solution for plants that have already experienced performance loss from PID: in these cases we propose a retrofit strategy, which is able to restore performance to near-factory output rates. It is possible to recover modules affected by PID, thanks to the latest PID-box technology and then, if required, remove the PID-box and install our inverter to be sure that PID will not reoccur.

This retrofit concept is compatible with all inverter types and array configurations making it a simple correction for PID losses. Laboratory test results, as well as a documented case history, show the benefits of these two BoS technologies in preventing and recovering PID in the field, instead of having to replace the PV modules.

We have a significant example of PID recovery in Sicily, Italy, where in less than 6 months an installation operated by Juwi saw the performance ratio reduce from 81% to 49%. The most downgraded section of the plant, the one with 50% reduction, showed a 50 Watt improvement just one night after installing the PID box. Some months later and after the PID box removal, the performance ratio was stable over 78%, thanks to the Omron Inverter which prevents PID.

PES: Geographically speaking, where are Omron’s key markets and do you have any plans for expansion into other areas?

ED: With reference to the EMEA Market and the Environmental Solution Business in Europe, our key markets are Italy and Spain. In Spain we sold more than 2800 KP100L, most of them from 2007 to 2010, while in Italy, up until now, we have sold more than 7280 units. In both countries we are going to replace them when the 5 year guarantee expires.

We are also very active in new PV markets (South Africa, Lebanon, Ukraine, Poland…). We have 39 sales offices and active sales channels in 22 countries all over Europe, ready for all new opportunities. We have just provided a training course in the Ukraine, where a Feed in Tariff was introduced once again in June 2015, due to the unstable political situation. We are also working in South Africa and in Lebanon, where our technical support is able to adapt our inverters to the local grid situation.

Antalya Stadium

The plant, with 5600 JA Solar monocrystalline modules and 124 Omron KP100L string inverters, is one of the highest capacity solar systems on a Stadium, aiming to apply for a Guinness Record.

Due to the full cylindrical form of the stadium each panel line is exposed to sunlight from a different angle. In order to obtain maximum performance, the system has been designed with small pieces, each one with the Omron inverter with 10 kWe output. In this way each 10 kWe piece runs independently and is able to give its best performance.

Annual yield expectation is 2,150,000 kWh, (1.4kWp), which is connected to the grid to sell electricity as a 2 x 700 kWp non-licensed application for 10 years over FIT.

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Eleonora Denna