



Team Solarium: Students Designing a Solar Electric Vehicle to Compete in Asia's Largest Electric Solar Vehicle Championship

As the automotive industry pivots towards powertrain electrification and global electricity grids migrate towards renewable energy generation, ATI Accurate Technologies India Pvt Ltd (ATI) is involved in an initiative that combines both of these disruptive technologies into a unique engineering challenge.

About Team Solarium

ATI is supporting Pune-based Team Solarium in the Electric Solar Vehicle Championship (ESVC) - a 2200 km cross-country race between Chandigarh and Pune that will take place in June 2022 and represents Asia's biggest solar challenge. Consisting of a group of passionate engineering students from various streams of Pimpri Chinchwad College of Engineering, Pune, Team Solarium has designed and manufactured an electric solar vehicle named "INVICTUS 4.0" which is a fifth-generation vehicle that is inspired and improvised from the previous models of "INVICTUS".

Team Solarium Senior Team Member Om Sarulkar believes they have always strived towards building the 'A-team' before building the 'A-car.' "The team gives utmost priority to team building, management and integration because we believe that without a good team, we can never build a good car," he explains. "By working together, we are able to incorporate several innovations that have always pushed the boundaries of limitations. Having worked our way up the ladder, we were able to incorporate various innovations in the vehicle for this season namely Torque Vectoring system, MPPT and self-designed BMS."

How Did ATI Products Help Team Solarium Meet the Development Challenges?

As part of the long-term technical support package ATI provided Team Solarium with the following components – a DLX data logger, a CW-401 Current Clamp Meter, plus a CANary interface module and the VISION data acquisition and calibration software. "Team Solarium required an "accurate" current sensor for measuring the power lines from HV components in our vehicle," comments Om Sarulkar. "For effective data management, we wished to filter and log data from different CAN nodes in the vehicle in different formats. These components offer various options which are unavailable in counterparts available in the market," he explains. "(Therefore) the scalability and reliability of ATI's components gave us an edge over an otherwise elementary design."







Team Solarium has used ATI's products throughout the development cycle. "In the prototype phase, we logged our sensor data from a test setup into the DLX data logger through a CAN bus," says Om Sarulkar. "Furthermore, we also prototyped the CANway current sensor to calculate the current on our battery and solar power lines to validate our simulations. These components gave us satisfactory results during the testing phase of our vehicle. Our vehicle dashboard houses an OBD port which is implemented through the CANary interface module. The products have been embedded in every step of the vehicle's lifecycle and have aided the growth of all the systems they have been a part of," he continues.

According to Om Sarulkar prior to ATI's involvement acquiring precise current data was a challenge, because locally available sensors offered a low resolution and significant drift in the values. "This was overcome by the high resolution (of ATI's products) and precise CANway current sensor. The DLX datalogger has features like 2 CAN channels, 4 analog inputs, 4 digital I/Os and low power consumption which helped us easily log our vehicle data from the CAN bus," he explains. Typically, this data is then retrieved and analyzed later, making the data safer and more available.

"Due to the use of ATI's equipment, there has been a significant improvement in the efficiency of the team," comments Sarulkar. "Being a prototype vehicle participating in a cross-country race, testing is a critical part of optimizing the vehicle, resulting in huge amounts of data generation. The DLX logger makes the logging process seamless. Team Solarium needs to calibrate our voltage and current sensors periodically and by using ATI'S current clamp, we were able to eliminate the tedious task of current measurement."





Commenting on the experience of ATI products Om Sarulkar said "We have used Kvaser's Memorator Pro V2 data logger to save the telemetry data in our escort vehicle. The performance of both the loggers was almost similar but the DLX edged the other due to its extra analog inputs which helped in extending the logger's functionality," he explains. "We have enjoyed the performance of the product and the quality that it brings while working. It has revolutionized the way in which the team retrieves the data, making tasks much easier to handle and process," he concludes.



Future Plans

So, what is next for the Team Solarium / ATI partnership? "Currently, the team is preparing for the forthcoming Electric Solar Vehicle Championship 3000 which shall be held in June 2022," Sarulkar explains. "This is a large-scale competition so Team Solarium will be requiring a greater amount of funds and technical support." Team Solarium's greatest aspiration in time is to participate in the World Solar Challenge (WSC) and the prestigious opportunity of representing the Indian nation on an international stage at the apex of the electric mobility revolution.

For further information on Team Solarium or ATI visit their respective websites: <u>www.teamsolariumindia.com</u> <u>www.accuratetechnologies.com</u>

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