Data Acquisition System Developed for Solar Cell Stringer

MAVERICK developed a data acquisition system for a major supplier of solar cell stringers.

Objective

MAVERICK was selected by a major supplier of photovoltaic (PV) manufacturing equipment to develop a data acquisition system for their flagship solar cell stringer. MAVERICK was chosen for the project due to familiarity with the PV supplier's product offerings as well as expertise in developing data acquisition systems.

Results

MAVERICK developed a data acquisition system that enables the end customer to establish a full genealogy of the solar modules it produces. This genealogy includes the lot numbers of all materials used, recipe and equipment setup parameters, and process information for each string and cell. The system interfaces to the end customer's manufacturing execution system (MES) using the PV industry standard, the SEMI PV equipment communication interface (PVECI) standard.

Solution

The MAVERICK team leveraged a supervisory control and data acquisition (SCADA) design specification previously developed for the customer's product line, providing a quick start to defining the system architecture and design.

The scope included specification and installation of a new MES host interface server.

MAVERICK selected the industry-leading SEMI PVECI software product, PEER Group's EIB (equipment information bridge), as a foundational element of the system solution. EIB forms a bridge between the stringer's control system and the MES host.

The team configured the EIB to collect process data. For each step of the string manufacturing process, the control system triggers an event which EIB detects. EIB then pulls the event-related process data from the control system and provides the information to the MES host in the form of an event report.

The EIB's configuration override capability was employed to easily support data collection from four solar cell stringers.

The MAVERICK team developed MES-related HMI screens as well as a detailed host interface specification, providing the information needed for the end customer to configure the MES host.

An extended EIB to store string data locally provides the following capabilities:

» All collected string information is provided to the MES host once the string is produced, rather than in a piecemeal fashion while the string is formed.
» String information can be queried locally in the event there are communication problems with the MES host.
» String process data is available for future analysis.

MAVERICK's solution:

» Fully meets the end customer's requirements with an easily maintainable solution.
» Can be reused and enhanced for other solar cell stringer customers.
» Supports the addition of alternate (non-SEMI PVECI) MES interfaces.
» Provides the foundation for extensions into the other areas of the PV supplier's product line.
» Optimizes future project and research and development funds due to its highly reusable design and implementation.

The MAVERICK Difference
MAVERICK provided the system architecture, design and development expertise to provide a solution that goes far beyond the needs of the immediate end customer and provides the foundation for data collection for all future end customers as well as all elements of the PV supplier's product line.

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