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Abstract
In recent years industries of solar energy are developing vigorously and the technique of manually soldering solar cells can satisfy neither the demands of markets on productivity nor the quality of PV-modules any more. Due to the lack of automatic soldering equipments, most manufacturers can not control the stability of solar cells soldering. During the manufacturing process, engineers also have difficulties to master soldering parameters such as soldering temperatures, moving speed and other conditions (usual soldering materials and Pb-free soldering materials, etc.) Particularly, when one of the parameters has to be changed, other parameters have to be adjusted through try-and-error, which is time wasting, and the best results can not be achieved for sure. The purpose of this project is to develop an automatic soldering system for solar cells. By analyzing the IV-curves of solar cells, we can understand the influences of soldering parameters on the efficiency lost of solar cells and the variation of inner resistance. The results of the experiments can then be served as references for optimizing the soldering parameters during manufacturing process. The interface of this soldering system is to be developed with the Mach program. The operating processes will be simplified and customized to meet the needs of manufacturers. Since this system is to developed with modular compartments, its cost will be rather low. With a small investment, manufacturers can improve their soldering process to enhance the competitive ability.
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