- In the past the diagnosis of PV panels was mainly devoted to evaluate the performance degradation due to the manufacturing process and to guarantee the 25 years lifetime; these analysis was essentially based on off-line costly laboratory measurement. Recent studies shown that the degradation of photovoltaic (PV) panels is accelerated by various unpredictable and unavoidable phenomena, e.g, the extreme environmental and operating conditions, or by the type of electrical connections thus, in order to prevent the stop of the PV plants, the development of on-line diagnostic techniques is assuming great of interest for the customers and manufacturers of PV systems. The real-time monitoring of the electrical and environmental operating conditions, devoted to the energy productivity analysis, is a feature already offered to the PV customers. However these analyses are mainly used to quantify the return of the investment of the PV plants. The estimation of the global energy productivity is a too coarse information for understanding the problems affecting the modules and for performing the right repairing. Thus, new and even more advanced on-line diagnostic algorithms must be developed in order to monitor the status of the cells and to predict failures before they lead to a significant reduction on the energy produced by the module. Such failures might be not only due to cells malfunctioning, but also to faults of the bypass diode the module is equipped with. This might happen due to repeated shadowing or to lightning. The aim of this lecture is to give an overview of the PV diagnostic methodologies proposed in literature. The main features of some PV commercial products are also shown. Finally a new approach for the on-line diagnostic will be discussed.