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Sommario/riassunto	Long description: The productive operation of machines and facilities is of great economic importance for industrial companies. In order to achieve high productivity, unscheduled production downtimes induced by faults need to be minimized. In this work, an approach for modelbased fault diagnosis of timed concurrent Discrete Event Systems is proposed that can contribute to this aim. The models are automatically determined by timed identification and partitioning. These approaches allow for efficient modeling of large and complex industrial systems with concurrent behavior requiring only little system knowledge. The work explains the theoretical and practical aspects of the presented approaches and gives a detailed evaluation based on a laboratory manufacturing system.