Abstract: Adaptive and flexible production systems require modular and reusable software especially considering their long-term life cycle of up to 50 years. SWMAT4aPS, an approach to measure Software Maturity for automated Production Systems is introduced. The approach identifies weaknesses and strengths of various companies’ solutions for modularity of software in the design of automated Production Systems (aPS). At first, a self-assessed questionnaire is used to evaluate a large number of companies concerning their software maturity. Secondly, we analyze PLC code, architectural levels, workflows and abilities to configure code automatically out of engineering information in four selected companies. In this paper, the questionnaire results from 16 German world-leading companies in machine and plant manufacturing and four case studies validating the results from the detailed analyses are introduced to prove the applicability of the approach and give a survey of the state of the art in industry.