Introduction

ASML Lithography designs, develops and manufactures wafer steppers and wafer scanners for the semiconductor industry (see Figure 1). The machine control of wafer scanners is the responsibility of advanced machine control software. To control parallel and/or synchronised execution of actions, the software component Synchronisation Control has been developed [1]. To verify several different design solutions for Synchronisation Control in a limited amount of time, simulation can be used.

Figure 1: ASML TWINSCAN AT:750

Objective

The aim is simulation of the software component Synchronisation Control for verification of the design.

Approach

The development of the simulation model consists of four stages [2]:
1. Determine the modeling objective.
2. Determine the source system that is the part of the real system we are interested in.
3. Determine the experimental frame that is the conditions under which the system is observed.
4. Design of the simulation model.

Model

The simulation model contains a model of the Synchronisation Control component (SN, see Figure 2) and an environment to make correct simulation possible.

Figure 2: Complete simulation model

For correct implementation of various software design solutions, model structure is well documented using diagrams derived from UML activity diagrams (see Figure 3). To facilitate interpretation of simulation results, various types of simulation output are used.

Figure 3: Used diagrams

Conclusion

In this project, an easily adaptable simulation model for the software component Synchronisation Control is developed. This simulation model can be used for timing analysis in various situations. Moreover, the model can be used to determine the effect of software design decisions on the timing performance of the total system.

References