1 General reflection of knitted fabrics

In order to understand the procedure better, during the work with DOKU.knit, a general representation is preceded in the following one.

1.1 By machine influenceable mesh structure end elements

The smallest unit of a knitted blank is the stitch. These can be influenced through different Yarn and machine attitudes:

- Yarn kind and Yarn color
- Stitch length
- Stitch, tuck loop, float, pressing off
- Stitch transfer, stitch takeover

For an entire course the possibilities exist:

- Knitted fabric
- Speed of carriage
- Needlebed racking, Racking correction

Enormous possible combinations result from that.

1.2 Stitch formation techniques

Combinations of stitches, tuck loop and stitch transfer show different knit construction:

- Plain stitch, purl stitch, all stitch
- Knitted lace to the left, knitted lace to the right
- Knit narrowing, knit widening
- Aran to the left, Aran to the right
- Plaits to the left, plaits to the right
- 2-, ,4-,5 colour Jacquard

The knitting constructions often are used in the same knitting row so that they have to be done in combination.

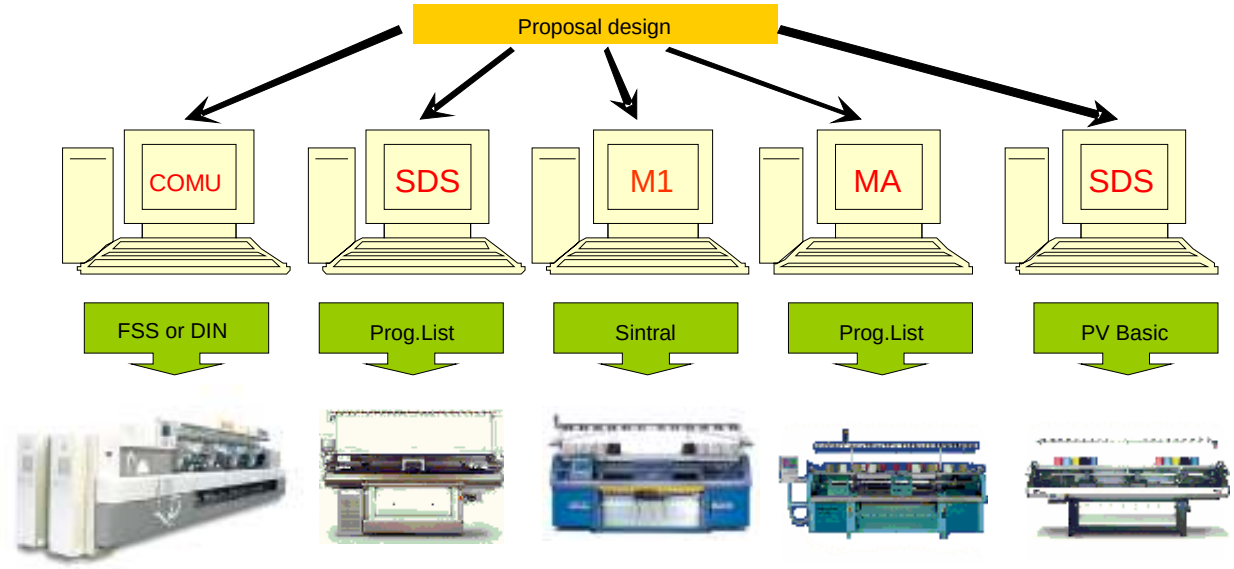
1.3 Knitted fabric

A knitted fabric consists of different knitted segments. Every segment is normally defined as different pattern. These patterns or forms subdivide in use and size:

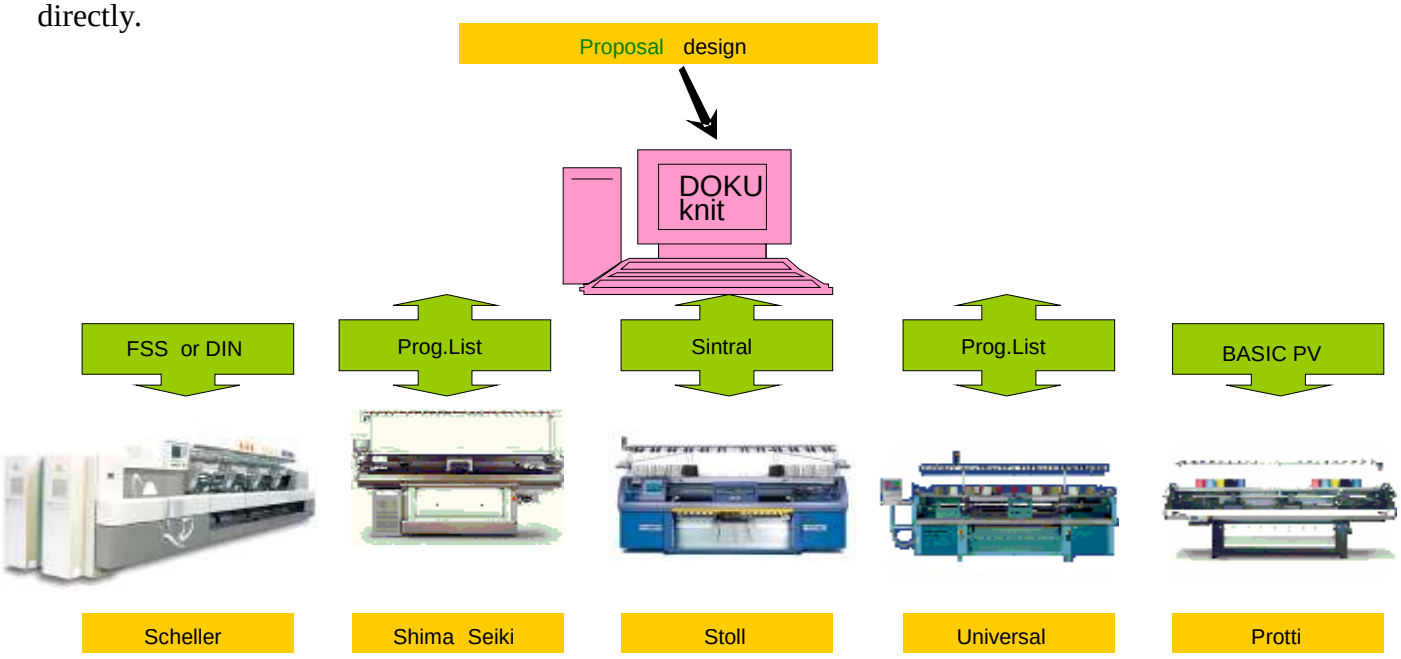
- Front
- Back part
- Sleeve
- collars
- Sizes 36- 58

1.4 Pattern systems for flat knitting machines

These are used for the creation of control programs for knitters. Every knitting machine manufacturer using own pattern system to do that.

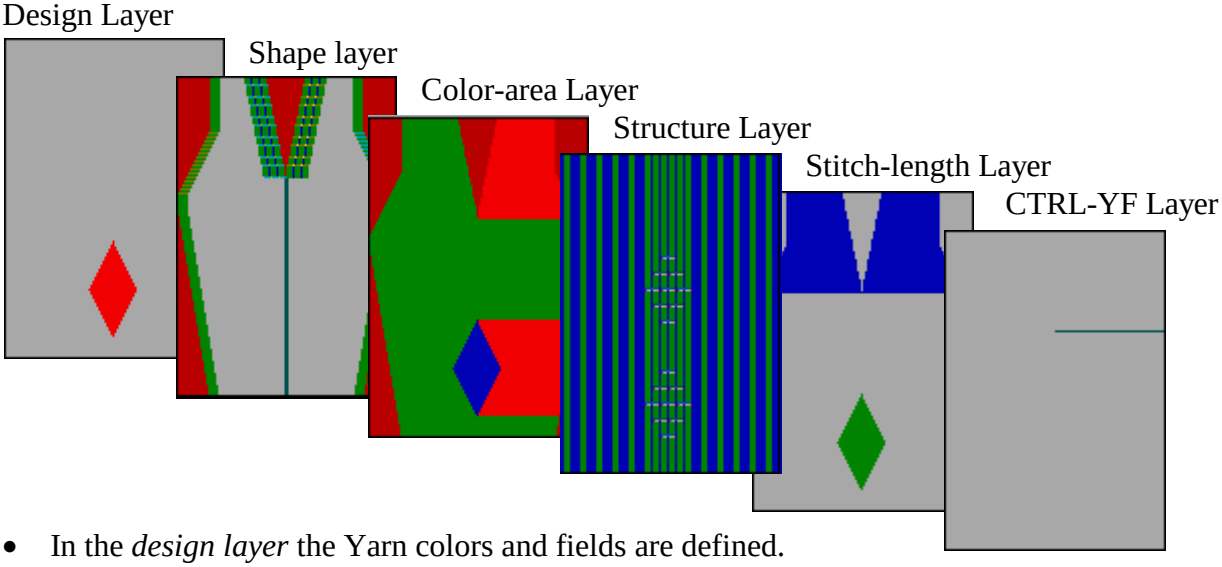


The main time creating a pattern is needed for painting and defining all technical informations with the pattern system. For to do the same pattern on different machinetypes the same job has to be down several times on different systems with different handling.
The main advantage in DOKU.knit is that the pattern created for one machinetype is useful also for all the other machinetypes. The technican need only to know the handling of one patternsystem to be able to create patterns for different machinetypes. In addition machine programs can be translated into other machine types directly.

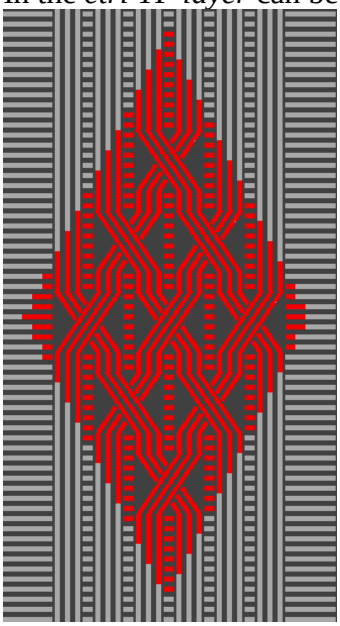


2 Stitch parameter in several picture layers

The great number of possibilities, which can be realized at a single stitch, required a lot of different informations at one picture position. The smallest information in a picture is a pixel with maximum 16Mill colors. To use one color for each different stitch-posibility is not handsome. In order to guarantee a best possible transparency here, the stitch properties are distributed at DOKU.knit onto different picture layers. These layers are at first completely independent from each other. The DOKU.knit-processing combines all information from the picture layers and produces a knitting-program from that.

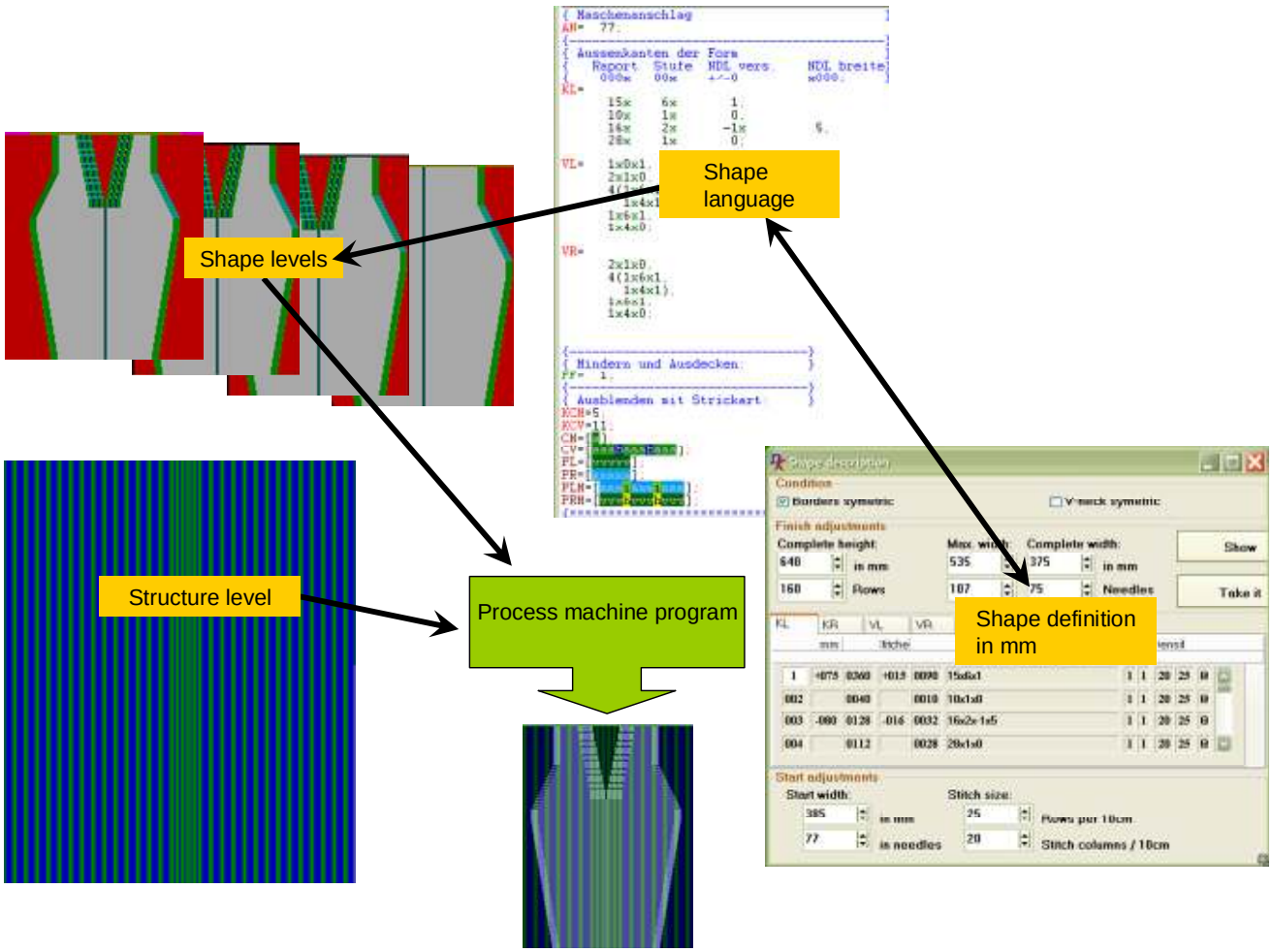


- In the *design layer* the Yarn colors and fields are defined.
- In the *shape layer* the knitted blank and the knitting techniques for the production of a shape are defined. With the help of a shaping tool this layer can be drawn automatically
- In the *color-area layer* the use of the feeders is shown in order to fulfill the conditions from the *design-layer* and *ctrl-YF layer*.
- In the *structure layer* the knitting technologies must be drawn. The knitting functions can be several stitches wide and high and are taken from a database set aside.
- In the *ctrl YF layer* can be taken influence onto the movements of the feeders.

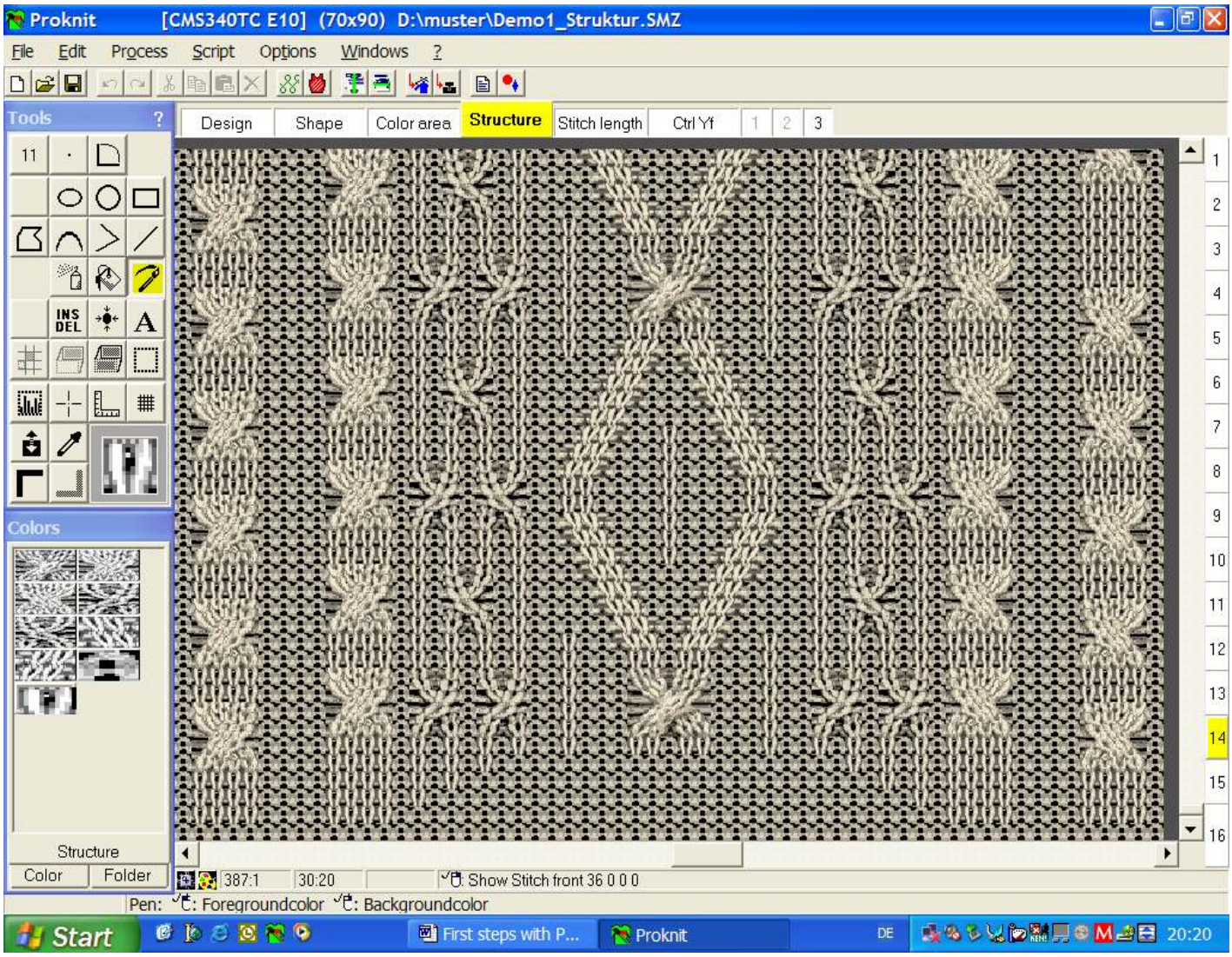


- The layers can be overlapped by each other and different presentations are selectable.
- Attention is to be paid in DOKU.knit that a scan line corresponds always to a complete knitted course.

Several sizes can be produced by use of an own *Shape layer* on basis of a pattern. For the description of the shape, a picture can be automatically drawn, using a symbolic language or shape measure tables.

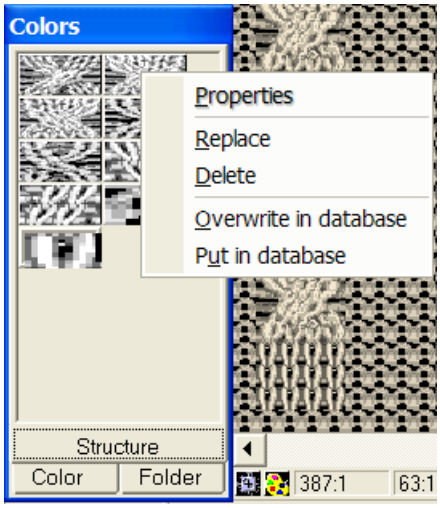


3 DOKU.knit, Painting surface

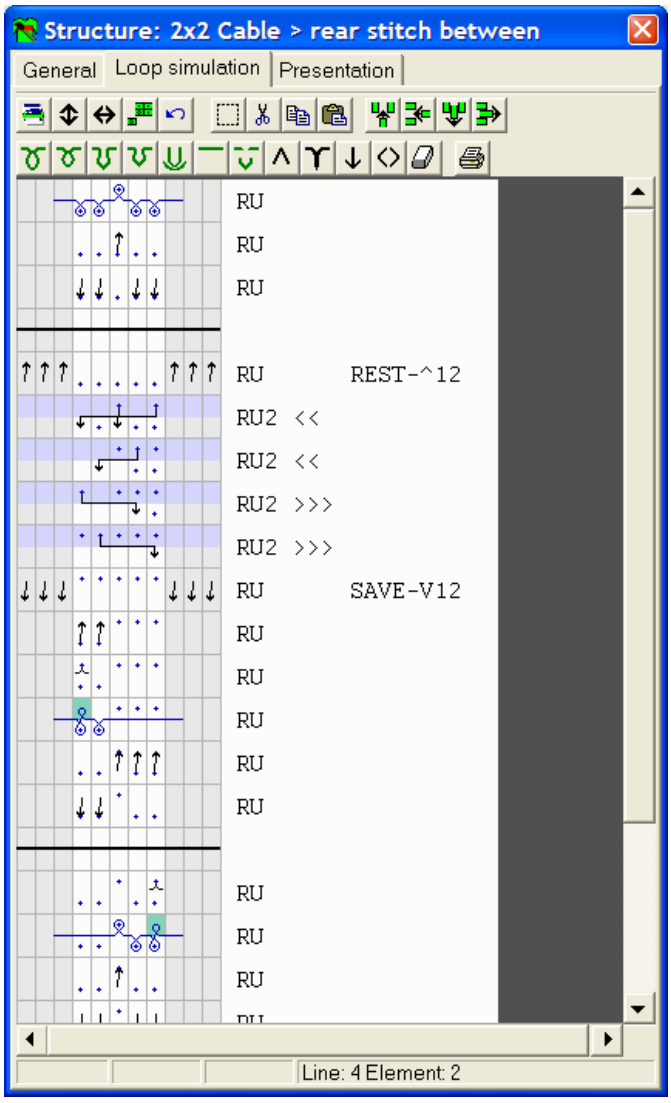


- Paint with stiches or colors
- There are different pictures for design, structure, stitchquality and shape informations.
- The pictures can be overlapped during the painting.
- All knitting-functions are linked from a database into the used structurset.

All structures which are used in the pattern and all machine parameters are saved with the pattern. With activated structure level the knitting functions which are used in the pattern are shown in the color-window. By pressing the right mouse button on knitting function. A popup menu is shown as below:

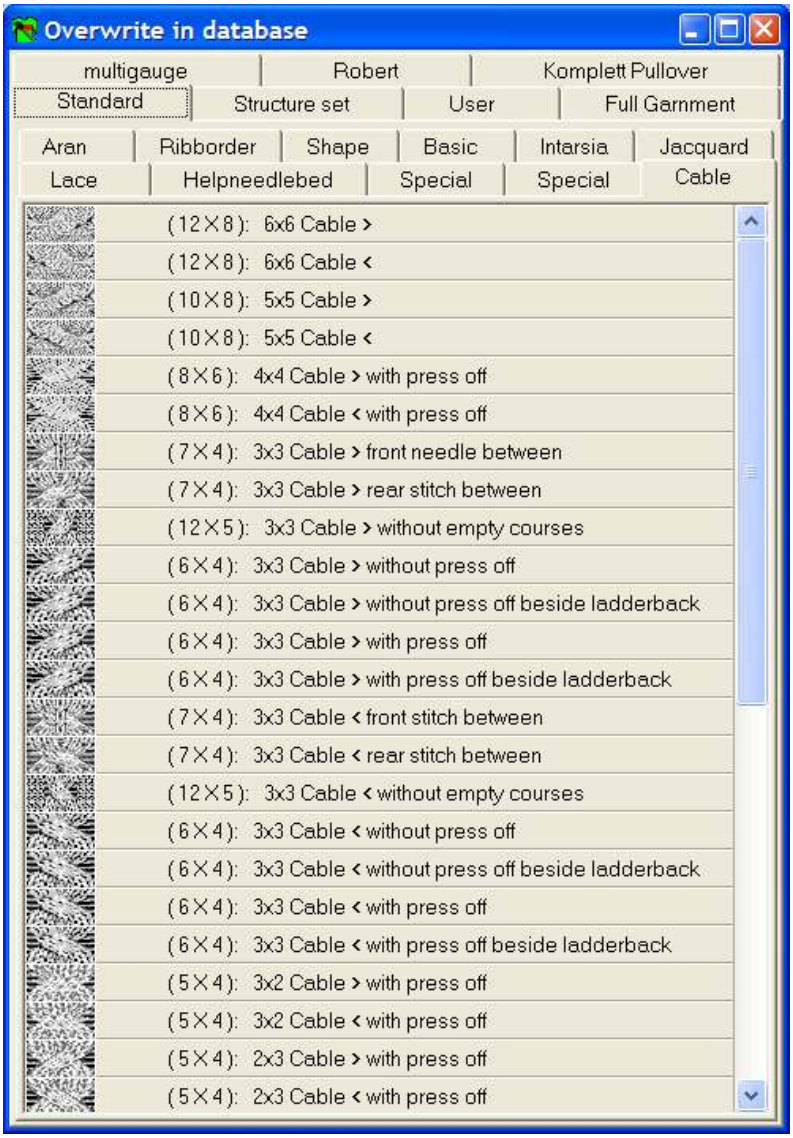


Properties:



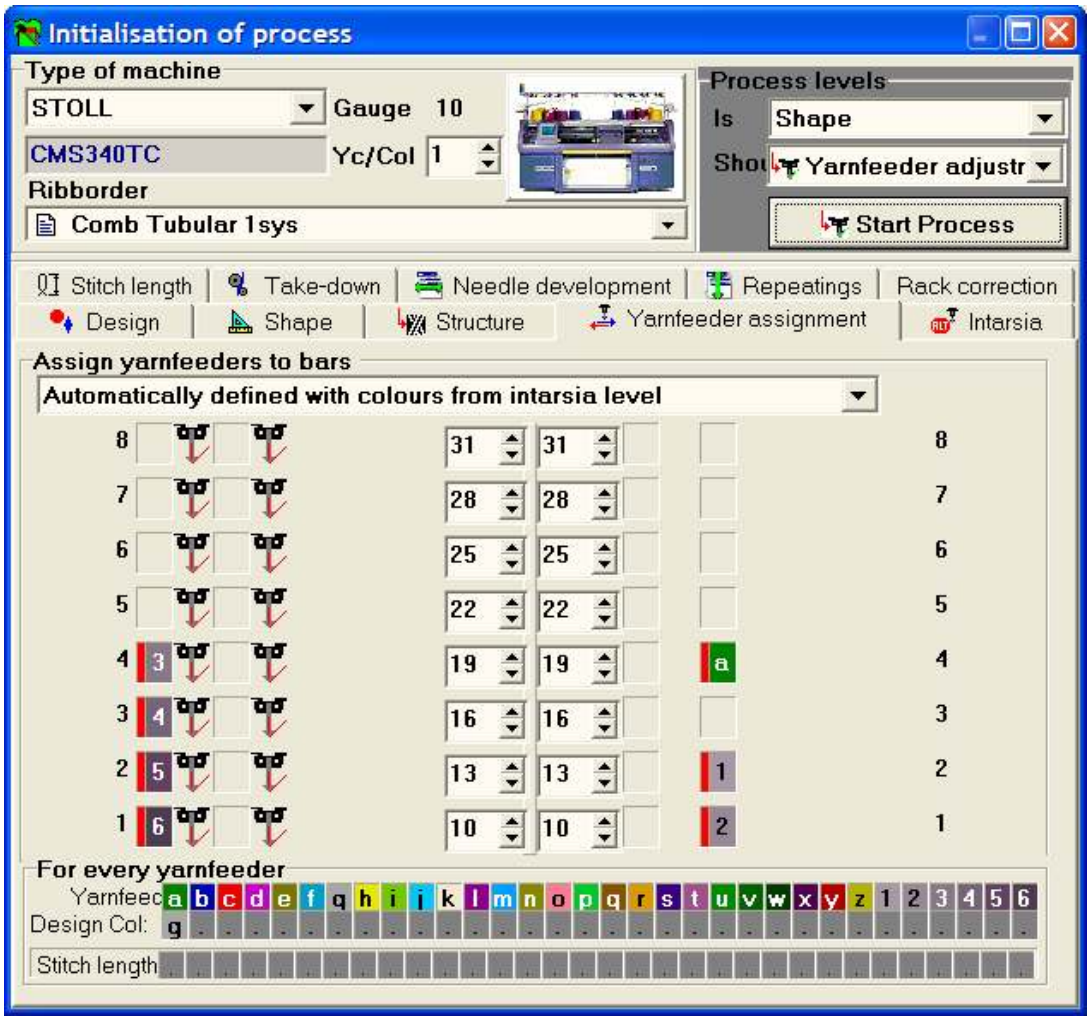
- Editing all Structures in a stitch-simulation-picture .

- **Put into / overwrite in database:**



- You are able to save changed structures in user-database or only with the active pattern.

All **parameters for the pattern** and the machine are defined in one window.

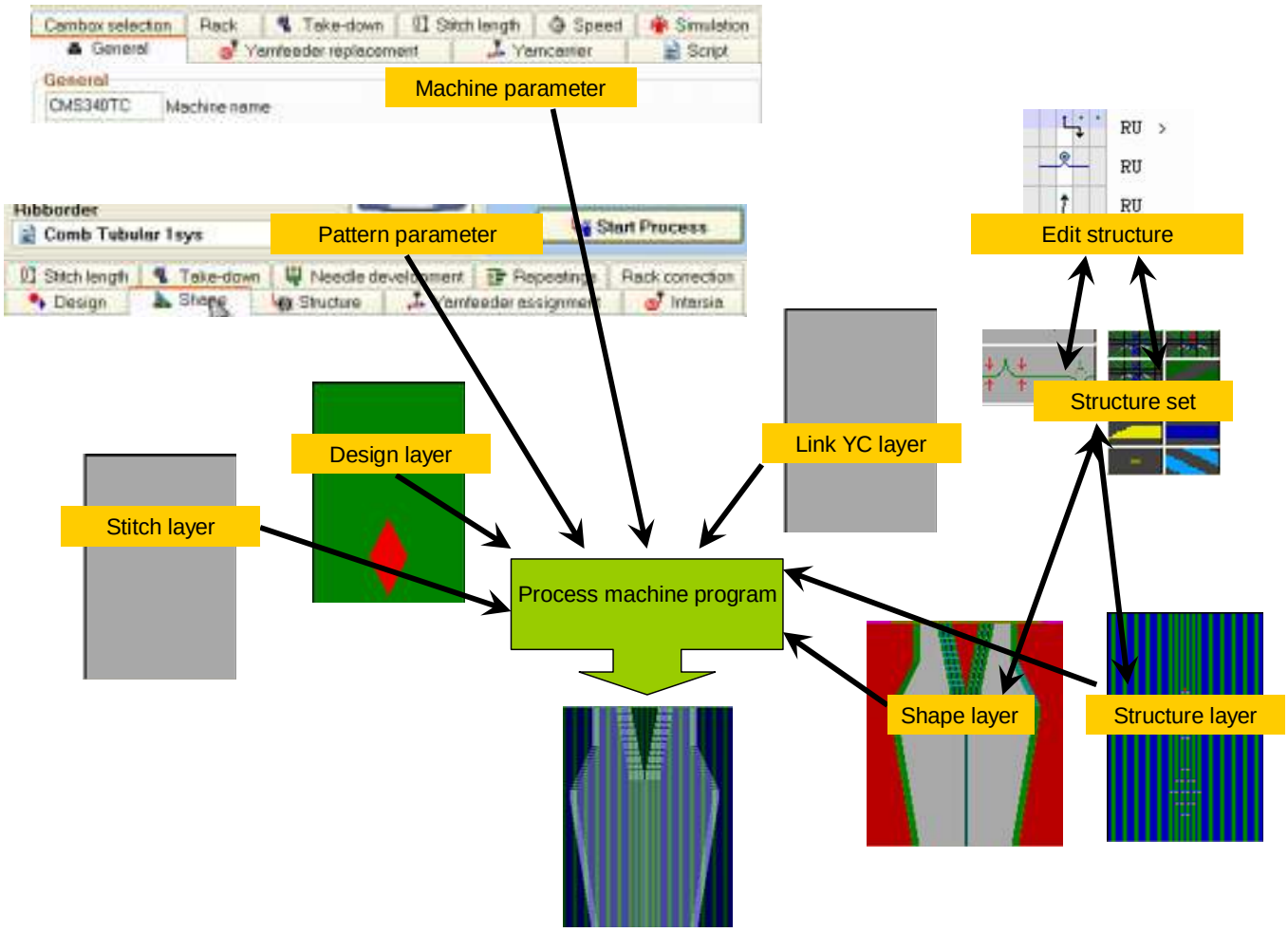


The rib is automatically load as a part of the picture or as a fixed rib.

All individual parameters are saved with the pattern.

4 Needed parts for creating a knitting program

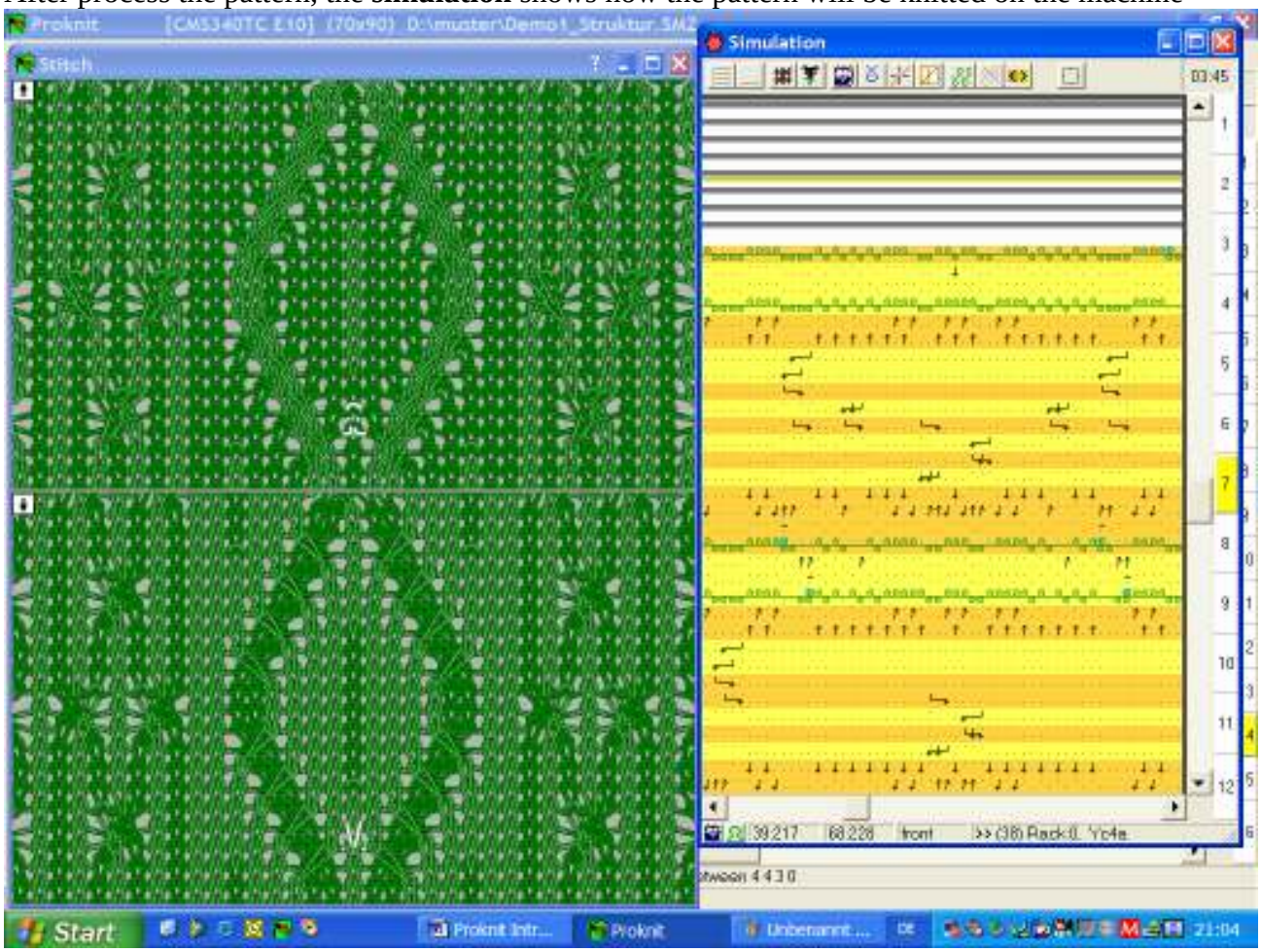
All pattern made with Doku.knit are composed minimum from the following kind of information



To create the same pattern for different machine-type, the part of the machine parameter has to be exchanged and the process to create the machine pattern has to run again.

5 Simulate the knitting program

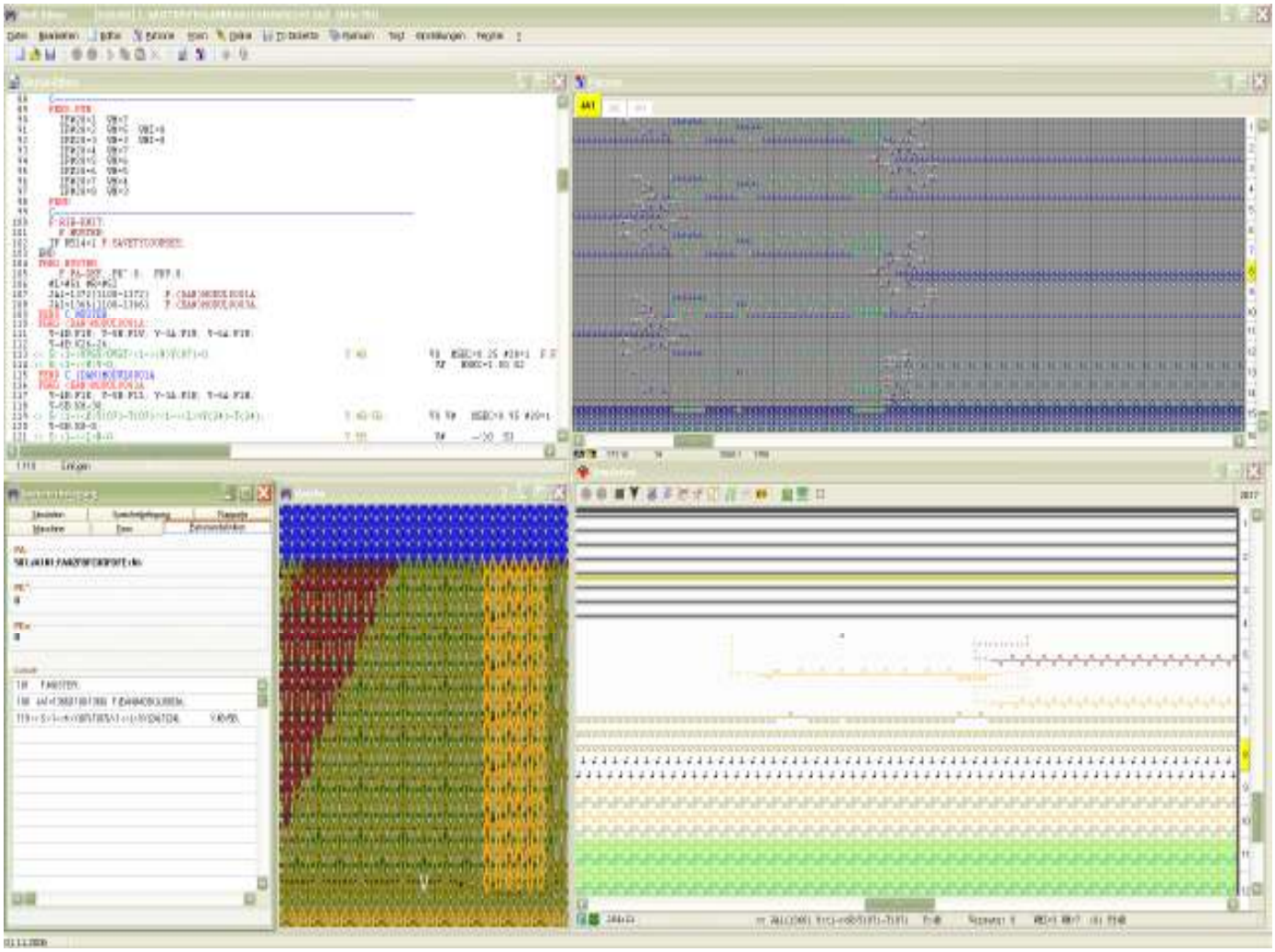
After process the pattern, the **simulation** shows how the pattern will be knitted on the machine



6 Edit the patterns on the machine level

There are different kind of editors for each type of machine manufacturer :
In the editors you are able to edit the program in the machine language, repaint the technical patterns and simulate the program. Together with DOKU.knit automatic processing, the machine editors are able to transfer patterns to other types of knitting machine and brand

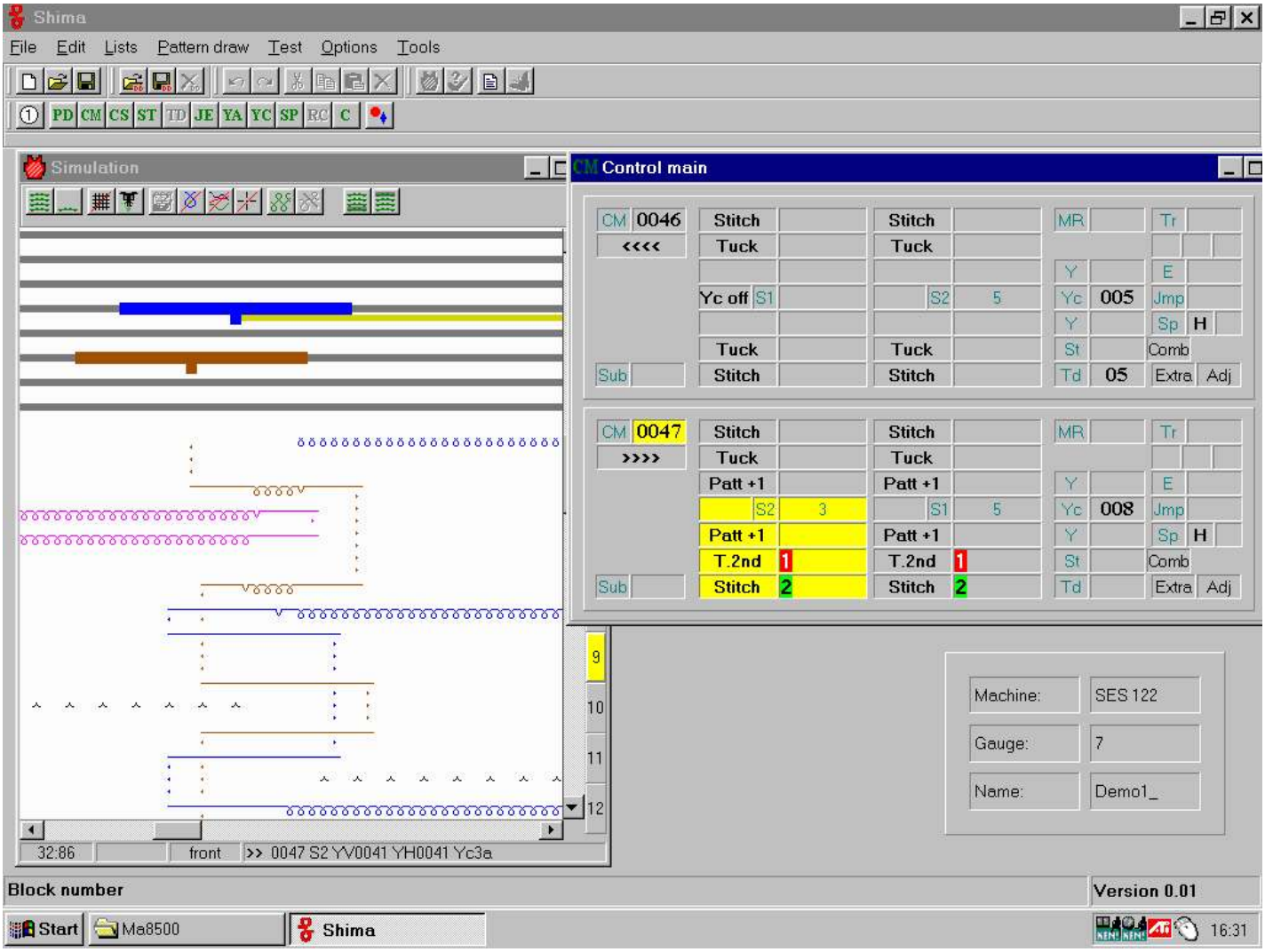
Stoll:



Shima and Universal:

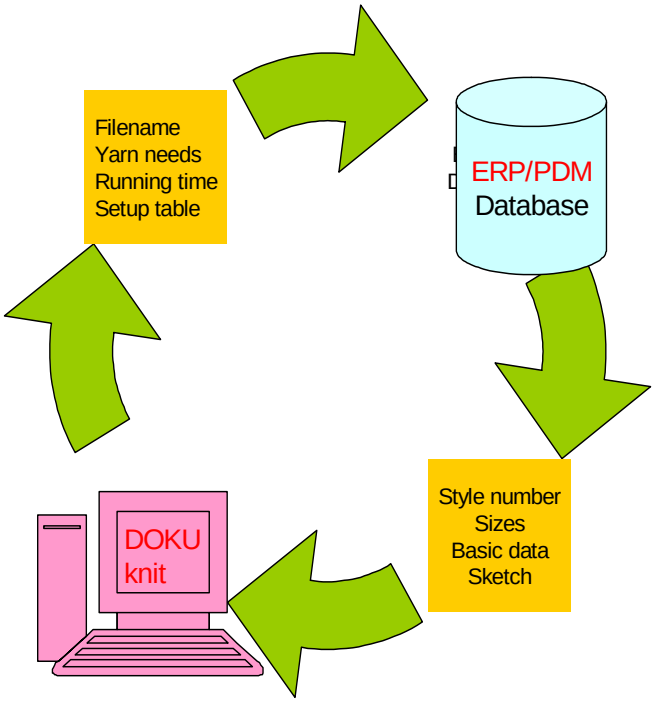
With a normal PC you are able to save and read from DD-discs the machine files.
To use the HD-discs you need a special drive.

You are able to edit all the lists, the technical pattern with fashion points, test the program with the simulation.



7 View

Integration of the pattern system to superordinate ERP and PDM System:



8 System requirements

PC :
Min. P4 with 1400Mhz;
Min. 3Gbyte free space on the HDD;
Min. 1GByte RAM;

Graphic-board with minimum size 1280x1024 and 24Bit-Colors.
Better a graphic board for two screens

Operating System: Windows XP, Windows Vista or WIN 7