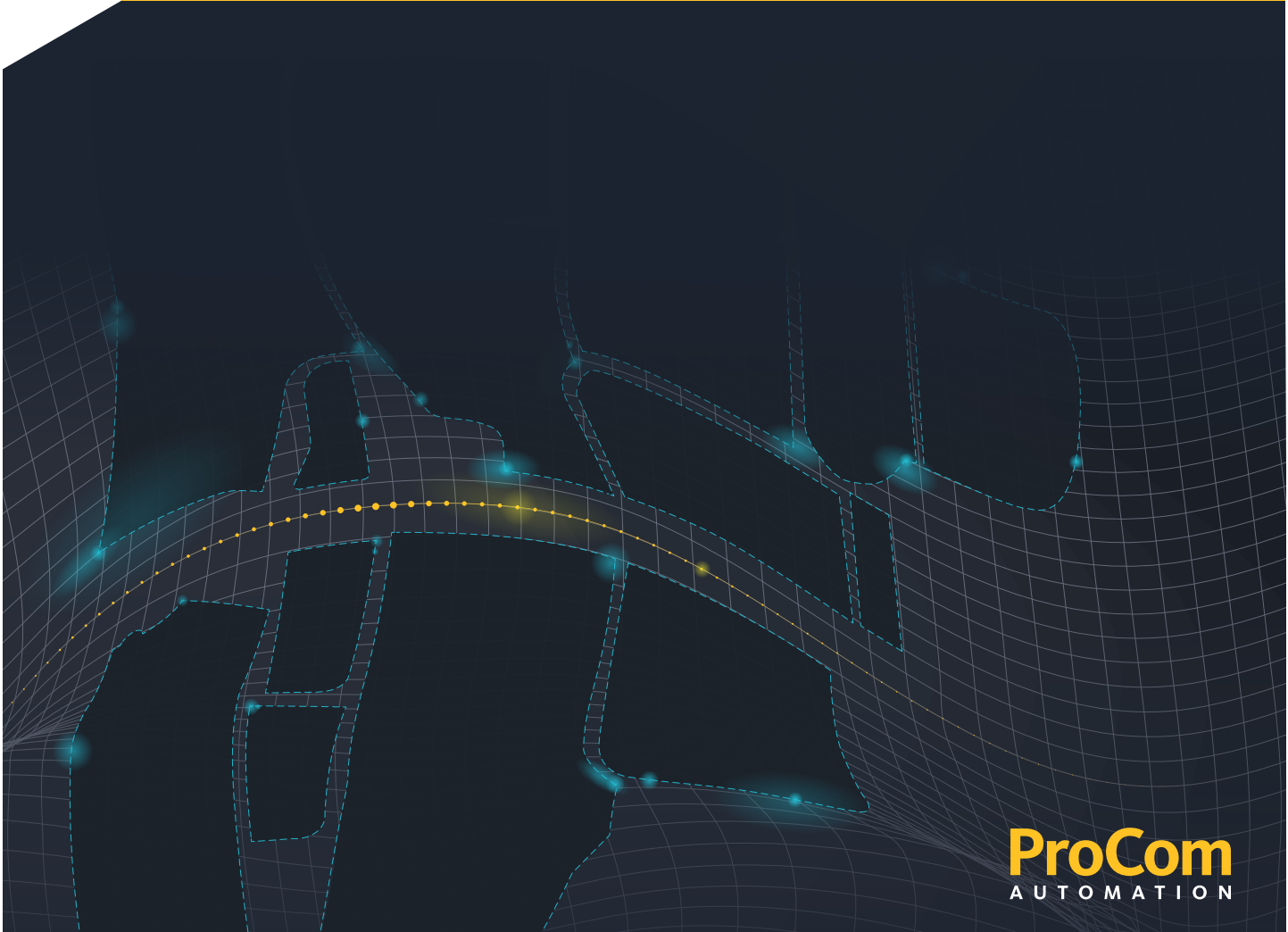


HIGH PLY CUTTER

# *CNC300 TEXTILE FEATURE PACKAGES*



**ProCom**  
AUTOMATION

ProCom Automation offers the CNC300 control solution for textile knife cutting in three variation packages with an additional range of functions:

## ESSENTIAL ★

The Essential function package offers machine manufacturers the option of equipping an inexpensive, high-quality basic machine with the ProCom solution. The Essential package offers all the features for precise and efficient cutting for the high layer cutter or the single layer cutter.

## PROFESSIONAL ★★

The Professional function package includes all the features of the Essential function package plus many additional functions that enable greater flexibility, configuration, optimization, precision and efficiency. It offers the machine manufacturer the option of equipping a high-end machine.

## PREMIUM ★★★

In addition to the features from the Essential and Professional function packages, the Premium function package offers high-quality special functions that are not required as standard in all high-end machines.

# FEATURES

## Machinery and tooling

	Feature	Essential	Professional	Premium
1	8 axis channels	X		
	16 axis channels		X	X
2	Tool Package	X	X	X
3	Drawing Tool	X	X	X
4	Advanced drilling tools		X	X
5	Interface for printer and labeler			X
6	Camera			Coming soon
7	80 DI / 80 DO	X		
	160 DI / 160 DO		X	X
8	EtherCAT Fieldbus	X	X	X
9	EoE	X	X	X
10	PLC IEC 61131	X	X	X
11	CNC300 Inspector	X	X	X
12	Control Panel		X	X
13	Joystick		X	X

# FEATURES

## CNC Features - 1

	Feature	Essential	Professional	Premium
1	Basic software	X	X	X
2	CNC function package for machine control	X	X	X
3	ProCom cutting application	X	X	X
4	ModernBlendTime		X	X
5	Basic package for sharpening	X		
	Complete package for sharpening		X	X
6	Input formats: ISO, DXF	X	X	X
7	Configuration of the DXF format with regard to part and tool assignment		X	X
8	Input format: HPGL		X	X
9	Parameterhandling	X	X	X
10	Job queue	X	X	X
11	Basic package for skew correction and marker placement	X		
	Complete package for skew correction and marker placement		X	X
12	Basic package for material feed and cutting window calculation	X		
	Complete package for material feed and cutting window calculation		X	X
13	Fabric end detection		X	X
14	Automatic fabric feed		X	X
15	Cutting during bitefeed			X
16	Basic package for processing notches	X		
	Complete package for processing notches		X	X
17	Vacuum control and pressure regulation	X	X	X
18	Control of different/ separate vacuum zones		X	X

# FEATURES

## CNC Features - 2

	Feature	Essential	Professional	Premium
19	Machine Manager	X	X	X
20	Basic package for crosscuts	X		
	Complete package for crosscuts		X	X
21	Restart	X	X	X
22	Restart after power failure		X	X
23	DryRun	X	X	X
24	Zero Buffer		X	X
25	Barcode Support		X	X
26	Complete package precision		X	X
27	ergoCAM		X	X
28	Fully automatic nesting		Optional	Optional
29	Re-cutting of defective parts		X	X
30	Production data acquisition (PDA)		X	X
31	Operating hours counter		X	X
32	PDA Interpreter			X
33	Shift management			X
34	Doubled parts		X	X
35	Integrated clearing graphic		X	X
36	Autonomous clearing aid			Coming soon
37	Radical speed reduction by DI		X	X
38	Perforated lines			X
39	Matching			Coming soon

# FEATURES

## Operation and interfaces

	Feature	Essential	Professional	Premium
1	ergoCNC	X	X	X
2	Contour window	X	X	X
3	Maintenance dialogue	X	X	X
4	Clouver Gateway	X	X	X
5	OPC UA Interface	X	X	X



# FEATURE DETAILS

## MACHINERY AND TOOLING

1

### 8 axis channels

- ▶ Standard assignment of the „XYCBHV“ axes: One X, Y and rotary axis, one feed axis for the bitefeed, knife stroke frequency and vacuum
- ▶ One X-gantry axis is possible

### 16 axis channels

- ▶ In addition to the standard axis configuration, further axes can be configured to control several tools (3 axis channels are preset from this)

2

### Tool Package

- ▶ Single, fixed mounted stitch cutter with speed-dependent cutter stroke frequency
- ▶ Other possible tools: drill, light pointer

3

### Drawing tool

- ▶ Drawing tool (drawing pen, spray tool) for drawing lines and contours
- ▶ Optional drawing of the entire marker

4

### Advanced drilling tools

- ▶ Control of several drills, also with different diameters
- ▶ Optionally one or two drilling tools
- ▶ Semi-automatic drill change

# FEATURE DETAILS

## MACHINERY AND TOOLING

5

### Interface for printer and labeler

An inkjet or labeler for printing labels can be mounted on the bridge.

Function overview:

- ▶ Printer with or without rotary axis for the printing head, or as a swiveling printer
- ▶ Functions for aligning labels and moving labels into the part
- ▶ Selection of printing direction depending on mounted inkjet or desired print image
- ▶ Large and small font sizes
- ▶ Automatic printing of the order number

Note: The printer driver must be provided by the customer.

6

### Camera

- ▶ Camera for matching and skew correction

7

### 80 DI / 80 DO

- ▶ A total of 5 groups for digital input and output signals. Each group manages 16 digital signals. Thus, a total of up to 80 digital input and 80 digital output signals can be connected to the machine and read in or be output

### 160 DI / 160 DO

- ▶ A total of 10 groups for digital input and output signals. Each group manages 16 digital signals

# FEATURE DETAILS

## MACHINERY AND TOOLING

8

### **EtherCAT Fieldbus**

Integrated and optimized connection to drive controllers from the following manufacturers for controlling servo motors via the EtherCAT fieldbus communication interface:

- ▶ Bosch-Rexroth
- ▶ Mitsubishi-Electric

9

### **EoE**

- ▶ ProCom EoE Gateway Software (Ethernet via EtherCAT functionality)

10

### **PLC IEC 61131**

- ▶ Integrated freely programmable soft PLC function with IEC61131 compliant programming language

11

### **CNC300 Inspector**

- ▶ ProCom CNC Inspector Software (for EtherCAT analysis)

12

### **Control panel**

- ▶ External operating panel (stationary or on the bridge) for selected operating functions, keyboard assignment for PLC functions



## FEATURE DETAILS

### MACHINERY AND TOOLING

13

#### **Joystick**

A joystick can be mounted on the machine bridge to move the bridge and cutting head in jog mode.

# FEATURE DETAILS

## CNC FEATURES

1

### Basic software

2

### CNC function package for machine control

- ▶ Lock, unlock, position, reference axes, stop, pause, continue
- ▶ Emergency stop without reference loss
- ▶ Feed material (Bitefeed)
- ▶ Switch and monitor digital signals
- ▶ Left / right variant of the machine

3

### ProCom cutting application

Time-optimized motion control, optimized for the high ply cutter:

- ▶ Contour smoothing by spline approximation
- ▶ Time-optimal motion control in compliance with the specified velocity, acceleration and jerk limit values (parameters)
- ▶ Optimal guidance of the HPC knife types through the contours. Configurable behaviour in corners, parameterizable per tool
- ▶ Automatic consideration of heel and overcut, parameterizable per tool

4

### ModernBlendTime

6% faster cutting and more productive manufacturing thanks to specialized motion algorithms.

Using ModernBlendTime algorithms, cutting patterns are processed measurably faster with high precision.

# FEATURE DETAILS

## CNC FEATURES

5

### Basic package for sharpening

- ▶ Automatic calculation of the optimum time for the sharpening cycles based on min. and max. sharpening distance
- ▶ Control of the sharpening unit

### Complete package for sharpening

- ▶ Sharpening during positioning
- ▶ Sharpening during bitefeed
- ▶ Knife width correction via degree of wear
- ▶ Monitoring of knife width with automatic request for knife change
- ▶ Control of different sharpening units
- ▶ Monitoring of the number of sharpening cycles and optional request for abrasive replacement

6

### Input formats: ISO, DXF

Supported file formats for job files: Gerber/ISO and DXF format.

7

### Configuration of the DXF format with regard to part and tool assignment

This function can be used to define how colours, layers and blocks of the DXF format are to be processed:

- ▶ Colours and layers can be used to identify parts or tools
- ▶ Blocks can be used to define parts
- ▶ DXFConf: simple program for visualization and analysis of DXF files and for assigning tools to contours

# FEATURE DETAILS

## CNC FEATURES

8

### Input format: HPGL

Markers with a simple HPGL feature set can be loaded and processed.

9

### Parameterhandling

- ▶ Wide range of setting options via parameters and parameter sets
- ▶ Parameterization for cutting process, machine equipment, user interface and functions
- ▶ The machine user is supported in the configuration process by simple dialogues

10

### Job queue

- ▶ Markers can be entered in a job list by specifying attributes such as parameter set, job number, number of repetitions, etc.
- ▶ Markers can be linked to form a complete order
- ▶ Markers can be rotated and mirrored locally
- ▶ Markers are processed on the machine according to the job list

11

### Basic package for skew correction and marker placement

- ▶ Simple and configurable functions for placing the marker on the material
- ▶ Selection of control points to be approached by the light pointer during referencing
- ▶ Automatic compensation of skew
- ▶ Optional setting of reference stitches for reliable referencing of the cutting windows after the feed, y-offset can be parameterized

# FEATURE DETAILS

## CNC FEATURES

### Complete package for skew correction and marker placement

- ▶ Centre referencing
- ▶ Referencing via repeat stripes
- ▶ Multiple referencing
- ▶ Parallel referencing (narrow fabric strips running in parallel)
- ▶ Manual referencing
- ▶ Cutting pattern scaling by skew correction

12

### Basic package for feed and cutting window calculation

- ▶ Material feed via bitefeed motor
- ▶ Cutting window calculation for whole parts (without cutting interruption)
- ▶ Bitefeed optimization (automatic correction of feed errors)
- ▶ Calculation of reference stitch position for skew correction

### Complete package for feed and cutting window calculation

Advanced functions for the feed of the material are:

- ▶ Bitefeed axis as drag axis
- ▶ Cutting window calculation with or without part interruption
- ▶ Intelligent cutting window calculation (only large parts are cut)
- ▶ Different bitefeed strategies (sequence and synchronization)
- ▶ Strip bitefeed for synchronous clearing

# FEATURE DETAILS

## CNC FEATURES

13

### Fabric end detection

- ▶ Detection of the end of the material via sensors or manually by the machine operator
- ▶ Automatic final cutting of the parts on the residual material
- ▶ Automatic marker generation from remnant parts
- ▶ Automatic insertion of this residual marker into the job queue so that it can be continued on the following roll of fabric

14

### Automatic fabric feed

Automatic calculation of the fabric requirement and automatic fabric feed when cutting from the fabric roll.

15

### Cutting during bitefeed

Cutting during the feed:

- ▶ While contours are being cut, the material is continuously moved forward on the cutting table
- ▶ Different strategies can be selected: continuous feed, few long feeds, regular feeds

16

### Basic package for processing notches

- ▶ Automatic detection of incisions (slit, stitch) and V-notches based on geometry
- ▶ A specially developed cutting process for slits and V-notches
- ▶ Notches can alternatively be punched with a notch tool

# FEATURE DETAILS

## CNC FEATURES

### Complete package for processing notches

Extensive functions for controlling notch processing:

- ▶ Special notch dialogue
- ▶ Conversion of notch (e.g. slits become V-notch, V-notch becomes slit etc.)
- ▶ Reparameterization of notch size and shape
- ▶ Selection of cutting methods for notches (with/without lifting the knife, with/without overcut, notch drawing, punching etc.)
- ▶ Selection of time (before/in/after part or cutting window)
- ▶ Drill dedication
- ▶ Drawing the notch

17

### Vacuum control and pressure regulation

- ▶ Control of the vacuum pump
- ▶ Vacuum control during the bitefeed

18

### Control of different/separate vacuum zones

- ▶ The cutting table can be divided into any vacuum zones by design
- ▶ The vacuum zones are configurable
- ▶ Automatic recognition of the affected vacuum zones depending on the position of the marker
- ▶ Automatic switching on and off of vacuum zones

19

### Machine Manager

Machine configuration.

- ▶ Configuration of tool holders and modules with assignment of axis channels
- ▶ Configuration of tools (only one cutting tool is allowed in the Essential package)
- ▶ Configuration of tool insets (knives, blades, etc.)

# FEATURE DETAILS

## CNC FEATURES

20

### Basic package for crosscuts

- ▶ With the manual crosscut, a cut along the y-axis is performed at the current machine position
- ▶ The automatic end crosscut performs a cut at the end of the marker

### Complete package for crosscuts

The separating cuts cut through the waste for better handling and disposal:

- ▶ End crosscut in advance, for premature change of the material roll
- ▶ End crosscut at parameterizable position
- ▶ End crosscut for linked cutting patterns
- ▶ Edge separation cut for separating waste strips at the edge of the material
- ▶ Continuous crosscut between parts or at the end of the cutting window
- ▶ Crosscut speeds
- ▶ Tool selection for crosscuts with parameterizable speed

21

### Restart

- ▶ Automatic continuation after stop, abort or emergency stop at the touch of a button
- ▶ Automatic continuation even after an abort during bitefeed
- ▶ An optimal reinserting position is calculated automatically
- ▶ Operating data acquisition is also continued

22

### Restart after power failure

- ▶ Even after a power failure, the cutting process can be restarted at the push of a button
- ▶ Markers that have already been started are automatically reloaded

# FEATURE DETAILS

## CNC FEATURES

23

### DryRun

All parts of a cutting window are processed in a test run with the tool lifted.

24

### Zero Buffer

Cutting with zero part distance, even with high layers:

- ▶ Nesting of parts with zero distance in ergoCAM
- ▶ Automatic detection of contact zones and lowering of cutting speed in contact zones
- ▶ Adaptation of knife intelligence for Zero Buffer
- ▶ Procedures for cutting the notches optimized for Zero Buffer

25

### Barcode Support

- ▶ Reading of marker file name, parameter set and job number via barcode scanner
- ▶ Automatic insertion of the marker into the job queue

# FEATURE DETAILS

## CNC FEATURES

26

### Complete package precision

Functions for optimizing the cutting quality:

- ▶ Avoidance of double cuts under consideration of notches
- ▶ Automatic optimization of the starting points in parts, different strategies can be configured
- ▶ Automatic detection and special treatment of inner contours and open inner contours
- ▶ Detection and special treatment of inside corners
- ▶ Optimization of cutting sequence of parts
- ▶ Small parts first for vacuum stabilization
- ▶ Special treatment of closed inner contours with special entry and exit strategy

27

### ergoCAM

Fully integrated CAM tool for preparing and optimizing markers.

Main tasks are:

- ▶ Manual nesting of parts for optimal utilization of material, including collision check
- ▶ Choice of nesting on material web or any material dimension
- ▶ Grouping of parts
- ▶ Duplication of parts and groups, e.g. as a matrix
- ▶ Rotation, mirroring of parts and groups
- ▶ Flexible definition of part sequence
- ▶ Definition of the cutting sequence within the part contours, one or more starting points could be reset arbitrarily
- ▶ Save single or multiple parts as a separate marker
- ▶ Re-cut parts (with integrated solution)
- ▶ Create simple contours (circles, rectangles)
- ▶ The current workspace can be saved and reloaded at any time
- ▶ Support of GerberISO, DXF and simple HPGL
- ▶ ergoCAM can also be used as a standalone application in the work preparation department

# FEATURE DETAILS

## CNC FEATURES

28

### Fully automatic nesting

Function for automatic nesting of parts on the material with excellent results in terms of material utilization.

This function can be purchased as an option with the Professional and Premium package.

29

### Re-cutting of defective parts

- ▶ Function for marking faulty parts during active cutting
- ▶ In ergoCAM: simple nesting of these parts after completion of the cutting process
- ▶ Automatic cutting of these parts or saving as a new marker

30

### Production data acquisition (PDA)

- ▶ Marker statistics
- ▶ Shift, daily and monthly protocols
- ▶ Configurable line log in Excel format
- ▶ More than 50 possible statistic values output in ergoCNC, in logfile and as files

31

### Operating hours counter

In addition to the machine run time, additional operating hour counters that are linked to a parameter status can be configured via an XML file. Maintenance times and messages can also be configured for these counters. All counters can be displayed and their maintenance request acknowledged using a dialogue in the maintenance task.

# FEATURE DETAILS

## CNC FEATURES

32

### PDA Interpreter

- ▶ PDA data is provided to the customer via CSV files for further processing
- ▶ Several different CSV files can be configured
- ▶ Automatic E-mail dispatch can be configured

33

### Shift management

- ▶ Machine operators log on and off in the shift dialogue
- ▶ Interruption times and reasons are recorded
- ▶ Shift-related line log, also endless

34

### Doubled parts

- ▶ Automatic detection of doubled parts based on geometry and position
- ▶ Extended heel and overcut ensure that the material is completely cut through

35

### Integrated clearing graphic

A clearing aid is integrated in ergoCNC:

- ▶ Display of the finished parts on a separate monitor at the clearing zone
- ▶ Optional: projection of the finished parts in the clearing zone

# FEATURE DETAILS

## CNC FEATURES

36

### Autonomous clearing aid

- ▶ Graphic support for clearing finished parts via monitor or projector
- ▶ Colour coding of related parts can be configured by the end customer
- ▶ Functions for labeling and selecting parts

(currently: old frontend required)

37

### Radical speed reduction by DI

Activating a digital signal reduces the speed of the machine by a configurable amount.

(e.g. operator triggers light barrier and thus reduces the movement speed of the machine)

38

### Perforated lines

Create and cut perforated lines.

39

### Matching

- ▶ Manual matching of parts to the patterned material via camera, projector or light pointer
- ▶ Matching of single parts, groups or on repeat
- ▶ Automatic collision check
- ▶ Definition of part groups at the machine
- ▶ Matching points can be inserted manually at the machine
- ▶ Matching parallel to cutting when dividing the cutting area into 2 halves

(currently: old frontend necessary)

# FEATURE DETAILS

## OPERATION AND INTERFACES

1

### **ergoCNC**

- ▶ User- and operation-oriented touch-capable user interface
- ▶ Configurable for custom look and feel
- ▶ Role specific tasks
- ▶ Language selection, any language configurable by customer
- ▶ Status bar with progress indicator

2

### **Contour window**

- ▶ Graphic display of the marker with colour visualization of the notches, inner contours, drawing lines, etc.
- ▶ Real-time display of the current cutting progress
- ▶ Display of labels
- ▶ Various functions for section modification to select parts and points
- ▶ Function for measuring distances and sizes

3

### **Maintenance dialogue**

Dialogue for good support:

- ▶ Configuration options for the service technician
- ▶ In the event of a fault: the machine operator can generate an image of the fault at the push of a button, all relevant data is automatically collected and saved in automatically generated file



# FEATURE DETAILS

## OPERATION AND INTERFACES

4

### Clouver Gateway

Sending process and machine data to the optional ProCom Clouver IIoT solution.

5

### OPC UA Interface

The interface enables remote control and monitoring of the machine.



# ProCom

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