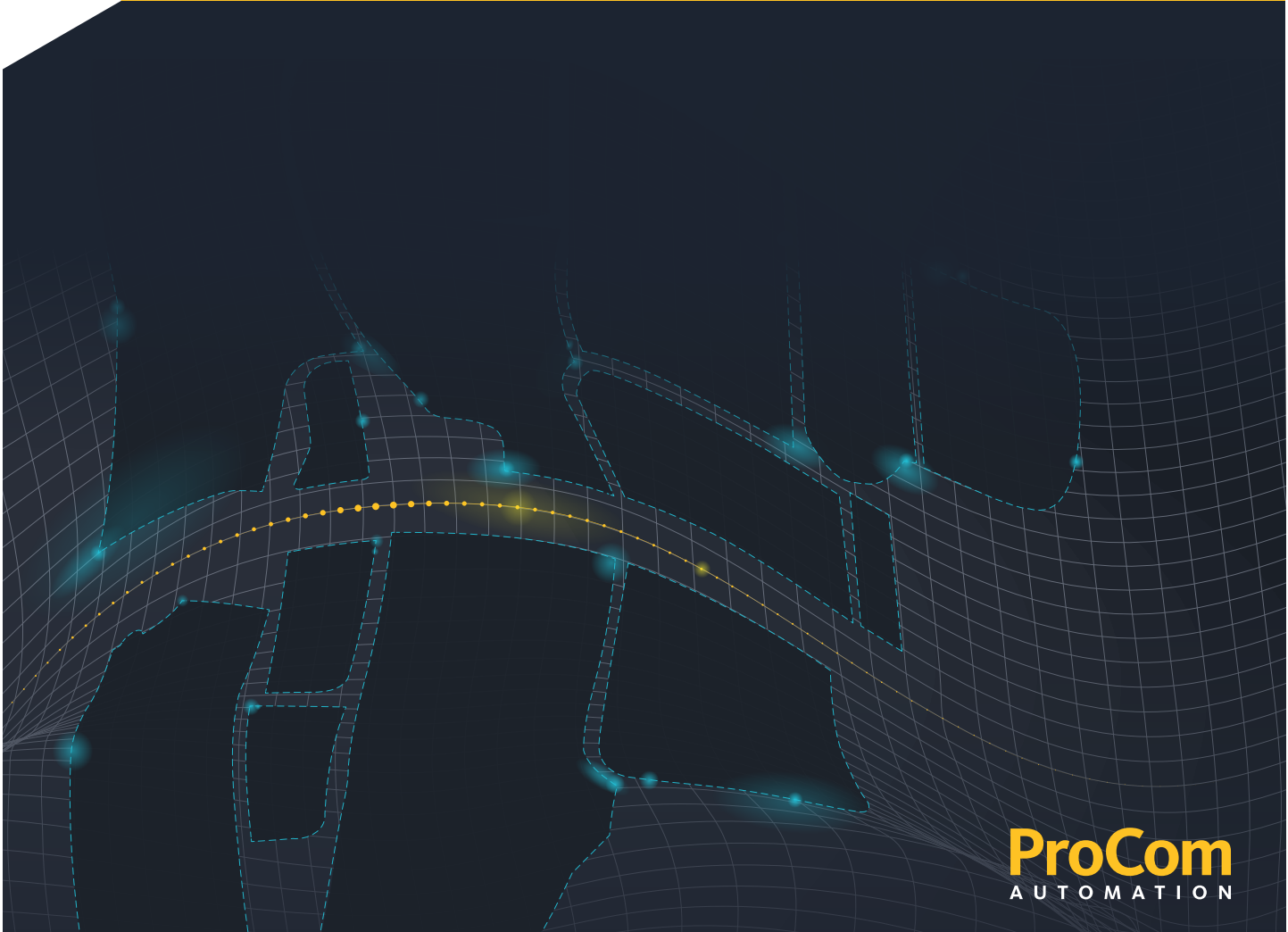


SINGLE-PLY CUTTER

CNC300 TEXTILE

FEATURE PACKAGES



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

	Features	Essential	Professional	Premium
1	8 axis channels	X		
	16 axis channels		X	X
2	Basic Tool Package	X	X	X
	Complete Tool Package		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
14	Gantry-Bitefeedaxis			X

FEATURES

CNC Features - 1

	Features	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	Height adjustment of the cutting table	X	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	Basic package for processing notches	X		
	Complete package for processing notches		X	X
16	Vacuum control and pressure regulation	X	X	X
17	Control of different/ separate vacuum zones		X	X
18	Basic package for Machine Assistant	X		
	Complete package Machine Assistant		X	X

FEATURES

CNC Features - 2

	Features	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

	Features	Essential	Professional	Premium
1	ergoCNC	X	X	X
2	Contour window	X	X	X
3	Maintenance dialog	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 „XYZ“ axes: One X and one Y axis, one rotary and one vertical axis
- ▶ One X-gantry axis is possible

16 axis channels

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

2

Basic Tool Package

- ▶ A single, permanently mounted standard single ply tool with a rotary axis and on a height axis, no tool change possible
- ▶ For the tool on one height axis, a height adjustment takes place automatically
- ▶ In addition, a notch tool can be used to punch out the notch
- ▶ A marker can only be processed with one cutting tool

List of supported standard tools:

- ▶ Light pointer
- ▶ Electrically driven rotary knife
- ▶ Electrically oscillating drag knife
- ▶ Pneumatically oscillating drag knife
- ▶ Standing, non-driven drag knife
- ▶ Non-driven rotary blade
- ▶ Rotating notch chisel
- ▶ Kisscut
- ▶ Drill
- ▶ Ultrasonic knife
- ▶ Other tangentially guided, driven or stationary, knives

FEATURE DETAILS

MACHINERY AND TOOLING

Complete Tool package

Extended single ply cutter tool support for full flexibility (configurable different SPC tools):

- ▶ The 16 axis channels allow additional rotary and vertical axes to be flexibly assigned to the tools or tool modules
- ▶ Several cutting tools can be mounted at the same time
- ▶ Easy tool change is made possible via the Material Assistant
- ▶ One marker can be processed with several cutting tools
- ▶ Configuration of the tool sequence independent of the default in the marker

The following additional special tools for single layer are possible:

- ▶ V-Cut
- ▶ Mill
- ▶ Creasing tool
- ▶ Additional drills

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 ink jet 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 swivelling printer
- ▶ Functions for aligning labels and moving labels into the part
- ▶ Selection of printing direction depending on mounted ink jet 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 optimised connection to drive controllers from the following manufacturers for controlling servo motors via the EtherCAT fieldbus communication interface:

- ▶ Bosch-Rexroth
- ▶ Mitsubishi-Electric

9

EoE

- ▶ 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.

14

Gantry bitefeed axis

For oversized cutters or for transporting particularly heavy material, a bitefeed drive can be mounted in addition to the clamping bar:

- ▶ Synchronous travel of the bitefeed axis to the clamping bar
- ▶ Material feed via joystick also possible with gantry bitefeed axis

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-optimised motion control, optimised for the single 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 different SPC 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 specialised motion algorithms.

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

FEATURE DETAILS

CNC FEATURES

5

Height adjustment of the cutting table

- ▶ Function for height measurement of the cutting table
- ▶ Automatic compensation of the height axis during cutting

6

Input formats: ISO, DXF

Supported file formats for job files: GerberISO 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 visualisation and analysis of DXF files and for assigning tools to contours

8

Input format: HPGL

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

FEATURE DETAILS

CNC FEATURES

9

Parameterhandling

- ▶ Wide range of setting options via parameters and parameter sets
- ▶ Parameterisation 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 parameterised

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

FEATURE DETAILS

CNC FEATURES

12

Basic package for feed and cutting window calculation

- ▶ Material feed via bitefeed motor or clamping bar
- ▶ Manual material feed via joystick and clamping bar
- ▶ Cutting window calculation for whole parts (without cutting interruption)
- ▶ Bitefeed optimisation (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 synchronisation of bridge and conveyor belt)
- ▶ Strip bitefeed for synchronous clearing

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.

FEATURE DETAILS

CNC FEATURES

15

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

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.)
- ▶ Reparameterisation 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

16

Vacuum control and pressure regulation

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

17

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

FEATURE DETAILS

CNC FEATURES

18

Basic package for Machine Assistant

- ▶ Easy selection and editing of cutting parameters per tool
- ▶ One "tile" per tool
- ▶ Manual dialogue-guided setting of the cutting height of a tool

Complete package Machine Assistant

- ▶ Material-dependent selection of tools and cutting parameters via „tiles“
- ▶ Simple dialogues for tool change or setting of cutting parameters
- ▶ Definition and saving of own „tiles“
- ▶ Manual configuration of the cutting height, also via button or joystick
- ▶ Automatic sensor-controlled calibration of the cutting height (if a calibration device is mounted)
- ▶ Functions for calibrating a tool (knife width, pivot point)

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 parameterisable 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 parameterisable 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
- ▶ Procedures for cutting the notches optimised 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

26

Complete package precision

Functions for optimising the cutting quality:

- ▶ Avoidance of double cuts under consideration of notches
- ▶ Automatic optimisation 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
- ▶ Optimisation of cutting sequence of parts
- ▶ Small parts first for vacuum stabilisation
- ▶ Special treatment of closed inner contours with special entry and exit strategy

FEATURE DETAILS

CNC FEATURES

27

ergoCAM

Fully integrated CAM tool for preparing and optimising markers.

Main tasks are:

- ▶ Manual nesting of parts for optimal utilisation 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

28

Fully automatic nesting

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

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

FEATURE DETAILS

CNC FEATURES

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.

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

FEATURE DETAILS

CNC FEATURES

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

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)

FEATURE DETAILS

CNC FEATURES

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 visualisation 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

AUTOMATION

ProCom Automation GmbH

Jülicher Straße 344
D-52070 Aachen

T +49 241 93681-500
contact@procom-automation.de
www.procom-automation.com