DYNACODE II

Operating Manual

valentin
DRUCKSYSTEME

Quality . Tradition . Innovation

Trademarks

All named brands or trademarks are registered brands or registered trademarks of their respective owners and may not be separately labelled. It must not be concluded from the missing labelling that it is not a registered brand or a registered trademark.

Carl Valentin direct print modules comply with the following safety guidelines:

CE EG Machinery Directive (2006/42/EG)

EG Low-Voltage Directive (2006/95/EG)

EG Electromagnetic Compatibility Directive (2004/108/EG)

Table of Contents

1   Introduction

1.1   General Instructions

Basic information and warning references with the corresponding signal words for the danger level are as follows specified in this manual:

DANGER identifies an extraordinarily great and immediate danger which could lead to serious injury or even death.

WARNING identifies a possible danger would could lead to serious bodily injury or even death if sufficient precautions are not taken.

CAUTION indicates a potentially dangerous situation which could lead to moderate or light bodily injury or damage to property.

NOTICE gives you tips. They make a working sequence easier or draw attention to important working processes.

Gives you tips on protecting the environment.

$\Rightarrow$ Handling instruction

∗   Optional accessories, special fittings

Datum   Information in the display

1.2   Intended Use

The direct print module is a state-of-the-art device which complies with the recognized safety-related rules and regulations. Despite this, a danger to life and limb of the user or third parties could arise and the direct print module or other property could be damaged while operating the device.

The direct print module may only be used while in proper working order and for the intended purpose. Users must be safe, aware of potential dangers and must comply with the operating instructions. Faults, in particular those which affect safety, must be remedied immediately.

The direct print module is solely intended to print suitable media which have been approved by the manufacturer. Any other or additional use is not intended. The manufacturer/supplier is not liable for damage resulting from misuse. Any misuse is at your own risk.

Intended used includes heeding the operating manual, including the maintenance recommendations/regulations specified by the manufacturer.

NOTICE!

The complete documentation is included in the scope of delivery on CD ROM and can also currently be found in the internet.

1.3   Safety Instructions

The direct print module is designed for power supply systems of 110-230 V. Connect the direct print module only to electrical outlets with a ground contact.

Couple the direct print module to devices using extra low voltage only.

Before making or undoing connections, switch off all devices involved (computer, printer, accessories etc.).

Operate the direct print module in a dry environment only and do not get it wet (sprayed water, mist etc.).

Do not operate the direct print module in explosive atmosphere and not in proximity of high voltage power lines.

Operate the direct print module only in an environment protected against abrasive dust, swarf and other similar impurity.

In case of cleaning and maintenance with an open cover, ensure that clothing, hair, jewellery and similar personal items do not contact the exposed rotating parts.

NOTICE!

With the open printing unit (due to construction) the requirements of EN60950-1 regarding fire protection casing are not fulfilled. These must be ensured by the installation into the end device.

The print unit can get hot during printing. Do not touch the printhead during operation. Cool down the print unit before changing material, removal or adjustment.

Carry out only the actions described in these operating instructions. Any work beyond this may only be performed by the manufacturer or upon agreement with the manufacturer.

Unauthorized interference with electronic modules or their software can cause malfunctions.

Other unauthorized work or modifications to the direct print module can endanger operational safety.

Always have service work done in a qualified workshop, where the personnel have the technical knowledge and tools required to do the necessary work.

There are warning stickers on the direct print modules that draw your attention to dangers. Therefore the warning stickers are not to be removed as then you and others cannot be aware of dangers and may be injured.

The direct printing unit must be integrated with the Emergency Stop circuit when it is incorporated into the overall machine.

All isolating safety equipment must be installed before starting-up the machine.

DANGER!

Danger to life and limb from power supply!

$\Longrightarrow$ Do not open the casing.

2   Machine Overview

The continuous and intermittent operating direct print module with high resolution is designed for installation in horizontal and vertical packaging machines. Convincing is the availability of left and right versions. Thanks to the separate control unit it is possible to integrate the direct print module almost in each packaging process without any problems.

Flexible labelling of packaging foil is effected either by means of Windows printer driver included in delivery or by our proven design software Labelstar Office.

With 8 vector fonts, 6 bitmap fonts and 6 proportional fonts the direct print module has a large selection at different font types. It can be printed inverse, in italic format or 90 degrees turned fonts.

The handling of our durable direct print modules is easy and comfortable. The device settings can be made by the integrated, intuitive touch-screen display.

By a new-developed electronics a maximum print speed up to 800 mm/s (continuous mode) and max. 600 mm/s (intermittent mode) can be achieved.

Time-saving printer update is possible by interface.

As default, the direct print module is equipped with a parallel, serial, USB and Ethernet interface. Additionally, the direct print module is equipped with an USB Host that permits the connection of an external USB keyboard and/or an USB memory stick. The direct print module automatically recognizes by which interface it is controlled.

Thanks to the large number of options the direct print module can be adapted to each task.

2.1   Connection Side of Print Mechanics

1 =   Pneumatic connection

2 =   Connecting cable SPI (printhead + sensors)

3 =   Connecting cable Power
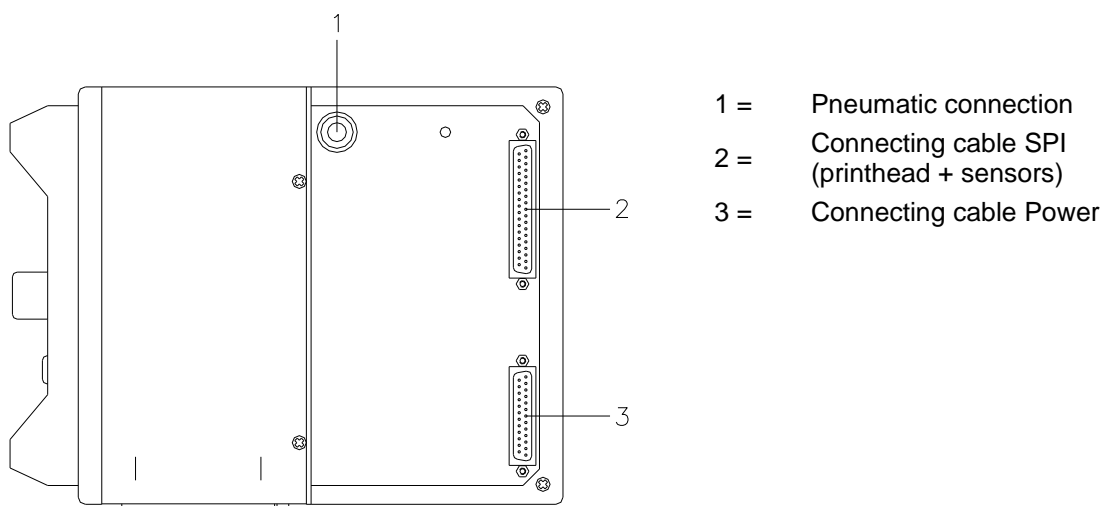
Figure 1

2.2   Connector Assignment of Control Unit
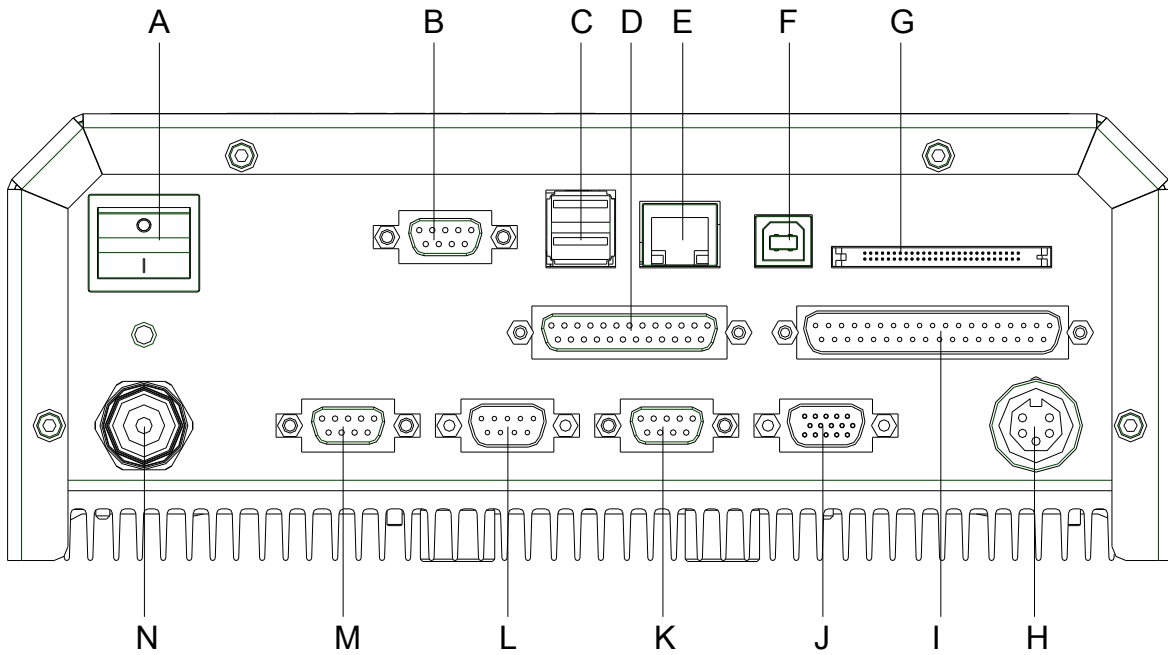
Figure 2

A =   Switch
B =   Serial interface RS-232
C =   USB Host interface (USB-B)
D =   Connecting cable Power
E =   Ethernet interface
F =   USB interface (USB-A)
G =   CF card slot
H =   Connection encoder
I =   Connecting cable SPI (printhead + sensor)
J =   Standard   Option
      SUB-D female connector 15pin   SUB-D male connector 9pin
      External socket I/O-24   External input 5-8
      see chapter 6.1   see chapter 6.1
K =   Externer Ausgang 5-8 (Output II)
L =   Externer Eingang 1-4 (Input I)
M =   Externer Ausgang 1-4 (Output I)
N =   Power line

3   Continuous Mode

3.1   Material Speed

Please note that the material has sufficient adhesion at the pressure transducer roll or encoder roll to permit the exact speed by the encoder.

It is only possible to print when respecting the operating conditions, i.e. the speed has to be observed.

3.2   Print Principle
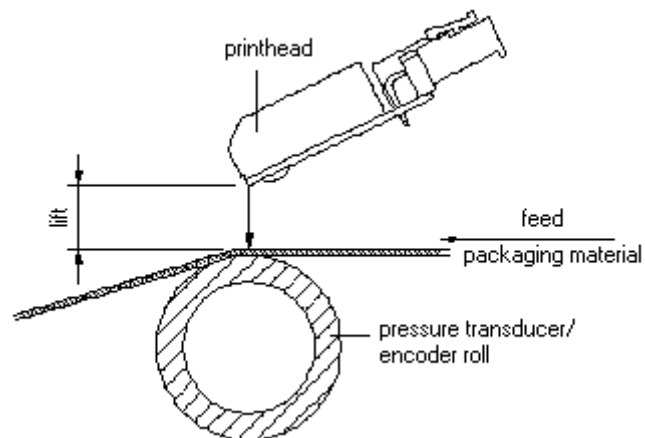
Figure 3

After starting a print order the printhead moves against the print medium. The feed of material is registered by the encoder and then evaluated. The printhead is in start position as long as the printing onto the moving material is finished and then it moves back to its home position.

3.3   Material Guiding
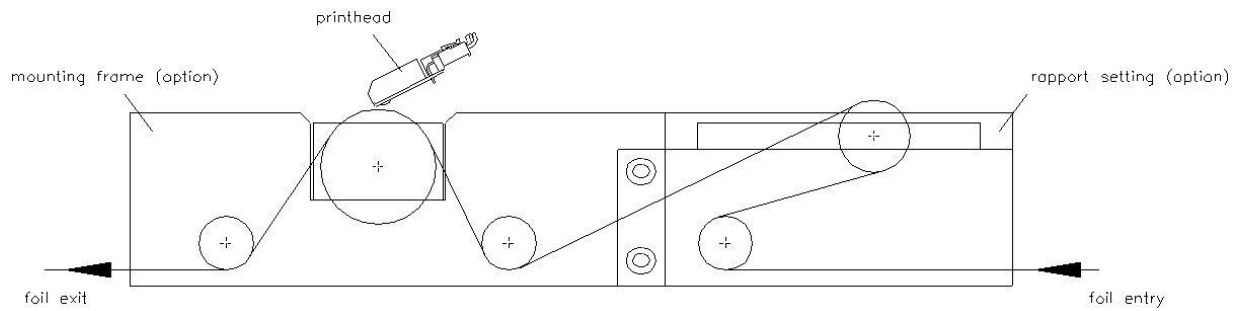
Figure 4

ℹ️ **NOTICE!**

In case the encoder is connected to the counter-pressure roll or the encoder roll you have to observe that the material has sufficient adhesion at the pressure roll or encoder roll to guarantee an exact speed by the encoder.

4   Intermittent Mode

4.1   Print Principle
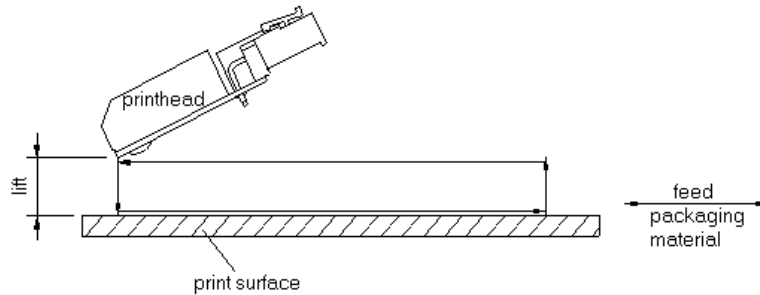
Figure 5

After starting a print order the printhead moves against the print medium. Afterwards the printing carriage moves corresponding to the set or transferred layout length linear over the material which is to be printed. After the print procedure the printhead again lifts up and the printing carriage moves again to the starting position.

4.2   Print Position

ⓘ   **NOTICE!**
The direct print module is delivered with a default print length of 65 mm. In order to use the maximum print length of 75 mm, the print position value must be changed to 93 (see chapter 9.5 Machine Parameters (Intermittent Mode), page 54).
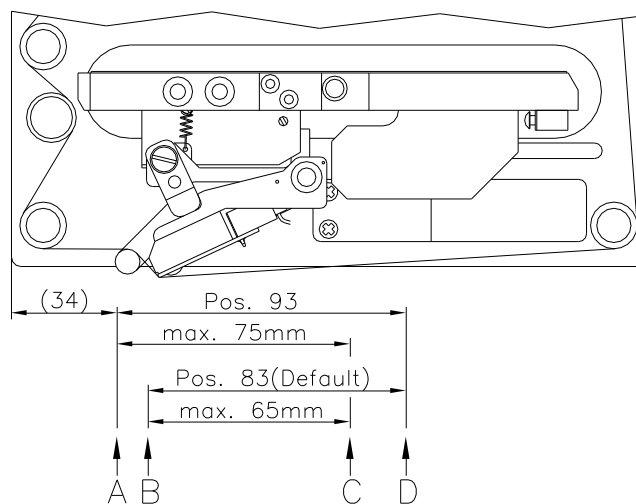
Figure 6

A: Print pos. / Start pos. value = 93   C: Max. position print end
B: Print pos. / Start pos. value = 83   D: Stand-by position

5   Operating Conditions

Before initial operation and during operation these operating conditions have to be observed to guarantee save and interference-free service of our direct print modules.

Therefore please carefully read these operating conditions.

Shipment and storage of our direct print modules are **only** allowed in original packing.

Installation and initial operation of direct print modules is only allowed if operating conditions were **fulfilled**.

Commissioning is prohibited until it can be established that, where relevant, the machine into which the partly completed machinery is to be incorporated complies with the provisions of Machinery Directive 2006/42/EC.

Initial operation, programming, operation, cleaning and service of our direct print modules are only recommended after careful study of our manuals.

Operation of direct print modules is only allowed by especially trained persons.

NOTICE!

Perform trainings regularly.
Content of the training are chapter 5 (Operating Conditions), chapter 8 (Loading the Transfer Ribbon Cassette) and chapter 11 (Maintenance and Cleaning).

These indications are also valid for someone else's equipment supplied by us.

Only use original spare and exchange parts.

Please contact the manufacturer with respect to spare/wear parts.

Conditions for installation place

The installation place of direct print module should be even, free of vibration and currents of air are to be avoided.

The direct print modules have to be installed to ensure optimal operation and servicing.

Installation of power supply

The installation of the power supply to connect our direct print modules has to be effected according to the international rules and regulations, especially the recommendations of one of the three following commissions:

- International Electronic Commission (IEC)

- European Committee for Electro technical Standardisation (CENELEC)

- Verband Deutscher Elektrotechniker (VDE)

Our direct print modules are constructed according to VDE and have to be connected to a grounded conductor. The power supply has to be equipped with a grounded conductor to eliminate internal interfering voltage.

Technical data of power supply

Power line voltage and power line frequency: See type plate

Allowable tolerance of power line voltage:
+6% … −10% of nominal value

Allowable tolerance of power line frequency:
+2% … −2% of nominal value

Allowable distortion factor of power line voltage: <=5%

Anti-interference measures

In case your net is infected (e.g. by using thyristor controlled machines) anti-interference measures have to be taken. It is possible to use one of the following possibilities:

- Provide separate power supply to our direct print modules.

- In case of problems please connect capacity-decoupled isolation transformer or similar interference suppressor in front of our direct print modules.

Stray radiation and immunity from disturbance

Emitted interference according to EN 61000-6-3: 01-2007

- Interference voltage to wires according to EN 55022: 05-2008

- Interference field power according to EN 55022: 05-2008

- System perturbation according to EN 61000-3-2: 09-2005

- Flicker according to EN 61000-3-3: 05-2002

Stray radiation and immunity from disturbance

Immunity according to EN 61000-6-2: 03-2006

- Stray radiation against discharge of static electricity according to 61000-4-2: 03-2009

- Electromagnetic fields according to EN 61000-4-3: 05-2006, ENV 50204: 03-1995

- Fast transient burst according to EN 61000-4-4: 07-2005

- Störfestigkeit gegen Stoßspannungen (Surge) gemäß EN 61000-4-5: 11-2006

- High-frequency tension according to EN 61000-4-6: 03-2009

- Voltage interruption and voltage drop according to EN 61000-4-11: 02-2005

Machine safety

- EN 60950-1: 2006 - Safety of pachaging machines

- EN 60204-1: 2006 - Safety of machinery - Electrical equipment of machines - Part 1

Connecting lines to external machines

All connecting lines have to be guided in shielded lines. Shielding has to be connected on both sides to the corner shell.

It is not allowed to guide lines parallel to power lines. If a parallel guiding cannot be avoided a distance of at least 0.5 m has to be observed.

Temperature of lines between: −15 … +80 °C.

It is only allowed to connect devices which fulfil the request 'Safety Extra Low Voltage' (SELV). These are generally devices which are checked corresponding to EN 60950.

Installation of data lines

The data cables must be completely protected and provide with metal or metallised connector housings. Shielded cables and connectors are necessary, in order to avoid radiant emittance and receipt of electrical disturbances.

Allowable lines

Shielded line:

      4 x 2 x 0,14 mm² (4 x 2 x AWG 26)
      6 x 2 x 0,14 mm² (6 x 2 x AWG 26)
    12 x 2 x 0,14 mm² (12 x 2 x AWG 26)

Sending and receiving lines have to be twisted in pairs.

Maximum cable length:

      interface V 24 (RS-232C) - 3 m (with shielding)
      USB - 3 m
      Ethernet - 100 m

Air convection   To avoid inadmissible heating, free air convection has to be ensured.

Limit values   Protection according IP: 20

Ambient temperature °C (operation): Min. +5 Max. +40

Ambient temperature °C (transport, storage): Min. −25 Max. +60

Relative air humidity % (operation): Max. 80

Relative air humidity % (transport, storage): Max. 80
(bedewing of direct print modules not allowed)

Guarantee   We do not take any responsibility for damage caused by:

- Ignoring our operating conditions and operating manual.
- Incorrect electric installation of environment.
- Building alterations of our direct print modules.
- Incorrect programming and operation.
- Not performed data protection.
- Using of not original spare parts and accessories.
- Natural wear and tear.

When (re)installing or programming our direct print modules please control the new settings by test running and test printing. Herewith you avoid faulty results, reports and evaluation.

Only specially trained staff is allowed to operate the direct print modules.

Control the correct handling of our products and repeat training.

We do not guarantee that all features described in this manual exist in all models. Caused by our efforts to continue further development and improvement, technical data might change without notice.

By further developments or regulations of the country illustrations and examples shown in the manual can be different from the delivered model.

Please pay attention to the information about admissible print media and the notes to the direct print module maintenance, in order to avoid damages or premature wear.

We endeavoured to write this manual in an understandable form to give and you as much as possible information. If you have any queries or if you discover errors, please inform us to give us the possibility to correct and improve our manual.

6   Technical Data

	Dynacode II 53	Dynacode II 107	Dynacode II 128
Print width	53.3 mm	106.6 mm	128 mm
Resolution	300 dpi	300 dpi	300 dpi
Print speed			
Continuous mode	50 … 800 mm/s	50 … 600 mm/s	50 … 450 mm/s
Intermittent mode	50 … 600 mm/s	50 … 600 mm/s	50 … 600 mm/s
Back speed	intermittend mode only: max. 600 mm/s		
Print length			
Continuous mode	6000 mm	3000 mm	3000 mm
Intermittent mode	75 mm	75 mm	75 mm
Frame passage width	customized	customized	customized
Printhead	Corner Type	Corner Type	Corner Type
Acoustic emission (measuring distance 1 m)			
Average sound power level	60 dB(A)	65 dB(A)	68 dB(A)
Transfer ribbon			
Ink	outside / inside (option)		
Max. roll diameter	98 mm	82 mm	75 mm
Core diameter	25.4 mm / 1"	25.4 mm / 1"	25.4 mm / 1"
Max. length	900 m	600 m	450 m
Max. width	55 mm	110 mm	130 mm
Dimensions in mm (width x height x depth)			
Print mechanics			
w/o mounting frame	204 x 182 x 235	204 x 182 x 290	204 x 182 x 310
with mounting frame	depends on passage width		
Control unit	251 x 96 x 207 - connecting cable set to mechanics 2.5 m		
Weight			
Print mechanics	9.5 kg	11 kg	11.7 kg
Electronics (incl. cable)	5.5 kg	5.5 kg	5.5 kg
Elektronik			
Processor	High Speed 32 Bit		
RAM	16 MB		
Slot	Compact Flash card type I		
Battery cache	for Real-Time clock (storage of data with shut-down)		
Warning signal	acoustic signal when error		
Interfaces			
Serial	RS-232C (up to 115.200 Baud)		
USB	2.0 High Speed Slave		
Ethernet	10/100 Base T, LPD, RawIP-Printing, DHCP, HTTP, FTP		
2 x USB Master	connection for external USB keyboard and memory stick		
Connection values			
Pneumatic connection	min. 6 bar dry and free of oil		
Nominal voltage	110 … 230 V / 50 … 60 Hz		
Nominal current	230 V / 1.5 A − 110 V / 3 A		
Fuse values	2x T4A 250 V		
Operation data			
Temperature	5 … 40 °C		
Humidity	max. 80% (non-condensing)		

	Dynacode II 53	Dynacode II 107	Dynacode II 128
Operation panel			
Touchscreen Display	800 x 480 pixel with background lighting screen size 7"		
Operating functions	Home, function menu, maintenance, memory card, print start, test print, feed, about menu		
Settings			
	date, time, shift times 11 language settings (others on demand) print and device parameters, interfaces, password protection		
Monitoring			
Stop printing if	end of ribbon / end of layout / printhead open		
Status report	extensive status print with information about settings e.g. print length counter, runtime counter, photocell interface and network parameters printout of all internal fonts and all supported bar codes		
Fonts			
Font types	6 Bitmap fonts, 8 Vector fonts/TrueType fonts, 6 proportional fonts other fonts on demand		
Character sets	Windows 1250 up to1257, DOS 437, 850, 852, 857 all West and East European Latin, Cyrillic, Greek and Arabic (option) characters are supported other character sets on demand		
Bitmap fonts	size in width and height 0,8 … 5,6 zoom 2 … 9, orientation 0°, 90°, 180°, 270°		
Vektor fonts/ TrueType fonts	size in width and height 1 … 99 mm variable zoom orientation 0°, 90°, 180°, 270°		
Font attributes	depending on character font - bold, Italic, inverse, vertical		
Font width	variable		
Bar codes			
1D bar codes	CODABAR, Code 128, Code 2/5 interleaved, Code 39, Code 39 extended, Code 93, EAN 13, EAN 8, EAN ADD ON, GS1-128, Identcode, ITF 14, Leitcode, Pharmacode, PZN 7 Code, PZN 8 Code, UPC-A, UPC-E		
2D bar codes	Aztec Code, CODABLOCK F, DataMatrix, GS1 DataMatrix, MAXICODE, PDF 417, QR Code		
Composite bar codes	GS1 DataBar Expanded, GS1 DataBar Limited, GS1 DataBar Omnidirectional, GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Truncated		
	all bar codes are variable in height, module width and ratio. orientation 0°, 90 °, 180°, 270°. Optionally with check digit and human readable line.		
Software			
Configuration	ConfigTool		
Process control	NiceLabel		
Design software	Labelstar Office Lite, Labelstar Office		
Windows printer driver	Windows 7® 32/64 Bit, Windows 8® 32/64 Bit Windows 8.1® 32/64 Bit, Windows 10® 32/64 Bit, Windows Server 2008® (R2) 64 Bit Windows Server 2012® 64 Bit, Windows Server 2012® (R2) 64 Bit		

Technical details are subject to change.

6.1   Control Inputs and Outputs (Standard)

Plug connection - back side of control unit
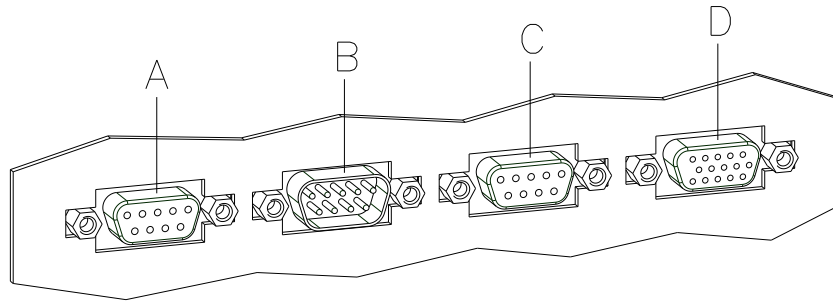
Figure 7

A = Output 1	Port 9-12
B = Input 1	Port 1-4
C = Output 2	Port 13-16
D = External bushing	Port 1 + 9
D = 15pin (I/O-24)	

Control outputs

By means of the signal outputs different operating states of the print module can be queried.

The signal outputs are provided by two 9-pin SUB-D-bushings (OUTPUT I and OUTPUT II) on the back side of the control unit.

They consist of optocoupler semiconductor sections, which are connected through and/or blocked according to different operating states.

The maximum allowable current in a semiconductor section is

lmax = 30 mA.
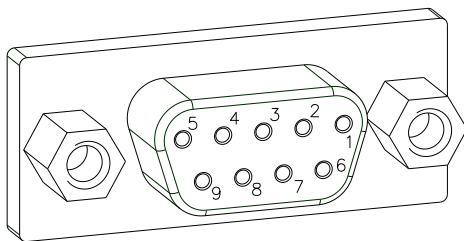
Output I
Figure 7, A

Figure 8

PIN (bushing)	Output I
9 (+) / 5 (-)	Out 1 / Port 9: Error message Each error status such as ribbon error is displayed.
8 (+) / 7 (-)	Out 2 / Port 10: Print order The print module was activated by a print order.
6 (+) / 2 (-)	Out 3 / Port 11: Generation The print module is filled with current layout data.
4 (+) / 3 (-)	Out 4 / Port 12: Layout print The content of print memory is transferred on the printable medium by means of the printhead.

Example   Connection of a lamp to a 24V relay by Out 1:

Figure 9

Output II
Figure 7, C
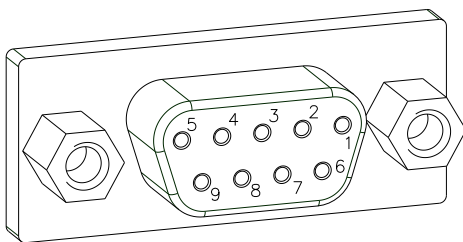
Figure 10

PIN (bushing)	Output II
9 (+) / 5 (-)	Out 5 / Port 13: Print-Ready signal It is indicated if the print module is ready to process a start impulse. In contrary to the print order signal, the generating time is taken into consideration.
8 (+) / 7 (-)	Out 6 / Port 14: Printhead up The printhead has reached the upper rest position (e.g. return to zero point).
6 (+) / 2 (-)	Out 7 / Port 15: Return to start After termination of print procedure the flexible part of the print module is moved back to the start position. After the start position was reached a new start can be released.
4 (+) / 3 (-)	Out 8 / Port 16: Prior warning of transfer ribbon end

Control inputs   By means of the control inputs it is possible to control printing. The control inputs at Input I are galvanic separated and have to be provided with an external tension source. The signal level is active "HIGH".

Input I
Figure 7, B

Figure 11

PIN (pin)	Input I
1 (+) 6 (-)	In 1 / Port 1: Print start
7 (+) 2 (-)	In 2 / Port 2: Not used
8 (+) 9 (-)	In 3 / Port 3: Reset external counter
4 (+) 3 (-)	In 4 / Port 4: Not used

Example   Connection of a switch with 24V voltage supply by In 1 / Port 1:
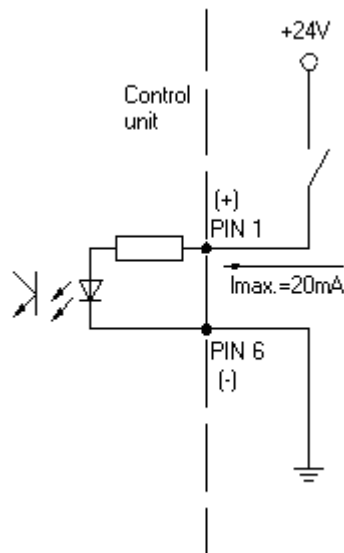
Figure 12

External bushing I/O-24
Figure 7, D

This input is executed as 15-pole and provides user-sided 24V/100mA.
In case of using this bushing, exists **no galvanic separation**.
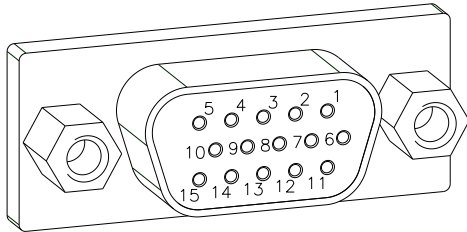
Figure 13

PIN	Port	Function
1, 6		Gnd
5, 10		24 V / 100 mA
3	1	Print start (NPN initiator)
2		Print start (PNP initiator)
4		Print start by potential-free contact
14		
7	9	Signal lamp 24 V / 100 mA (error)
13		

Pin assignment for connecting cable External bushing I/O-24

PIN 1	white
PIN 2	brown
PIN 3	green
PIN 4	yellow
PIN 5	grey
PIN 6	pink
PIN 7	blue
PIN 8	red
PIN 9	black
PIN 10	purple
PIN 11	grey-pink
PIN 12	red-blue
PIN 13	white-green
PIN 14	brown-green
PIN 15	free

Example 1

Pin 2
Pin 12

Control unit

Sensor
NPN output

24V   Pin 5
Signal   Pin 3
GND   Pin 1

I/O 24 connector
15-pole
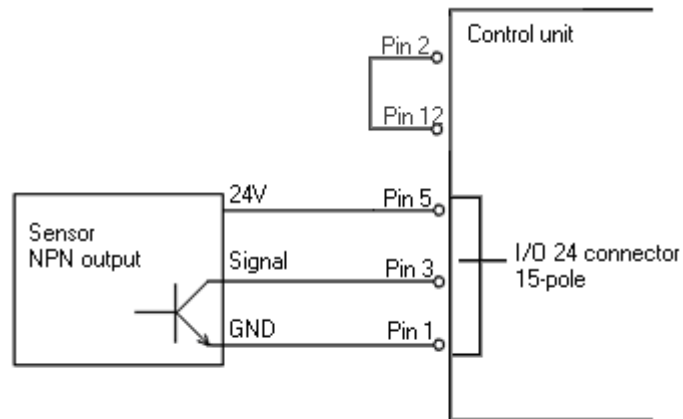
Connection scheme for creating a start
signal by a sensor with NPN output

Figure 14

Example 2

Pin 3
Pin 9

Control unit

Sensor
PNP output

24V   Pin 5
Signal   Pin 2
GND   Pin 1

I/O 24 connector
15-pole
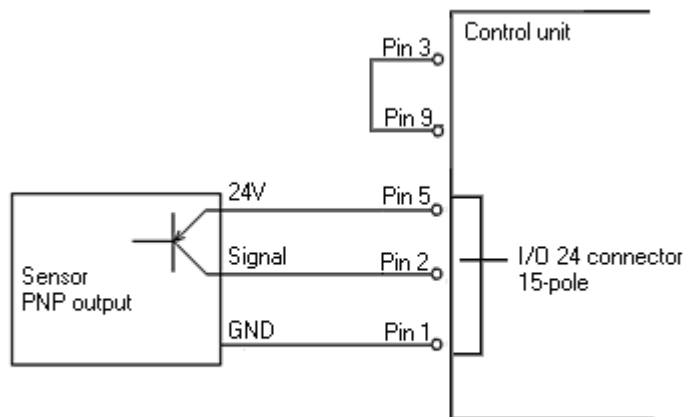
Connection scheme for creating a start
signal by a sensor with PNP output

Figure 15

Example 3

Pin 4
Pin 14

Control unit

Connection scheme for creating a start
signal by a potential-free contact

Pin 7

Pin 13

I/O 24 connector
15-pole
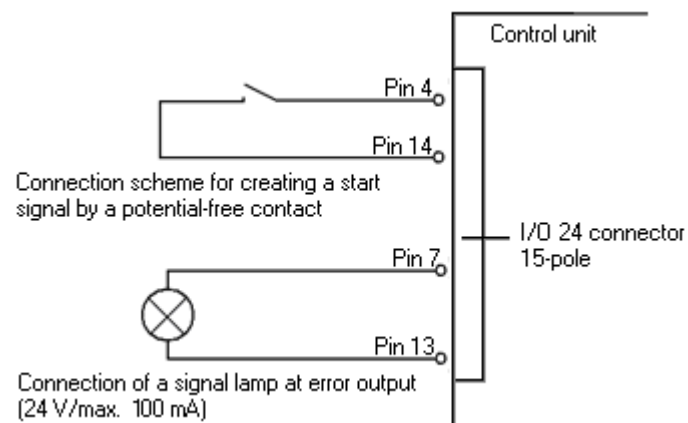
Connection of a signal lamp at error output
(24 V/max. 100 mA)

Figure 16

6.2   Control Inputs and Outputs (Option)

Plug connection - back side of control unit
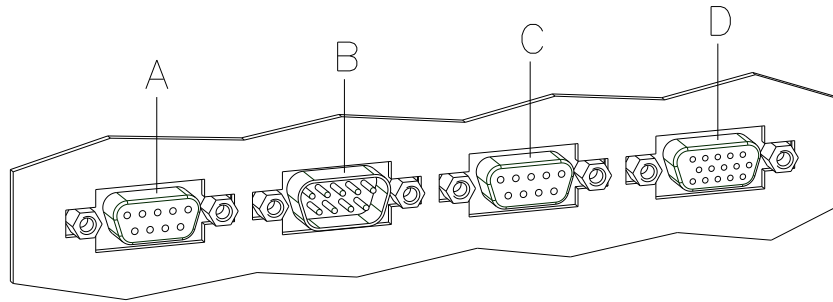
Figure 17

A = Output 1   Port 9-12
B = Input 1   Port 1-4
C = Output 2   Port 13-16
D = Input 2   Port 5-8

Control outputs

By means of the signal outputs different operating states of the print module can be queried.

The signal outputs are provided by two 9-pin SUB-D-bushings (OUTPUT I and OUTPUT II) on the back side of the control unit.

They consist of optocoupler semiconductor sections, which are connected through and/or blocked according to different operating states.

The maximum allowable current in a semiconductor section is

lmax = 30 mA.
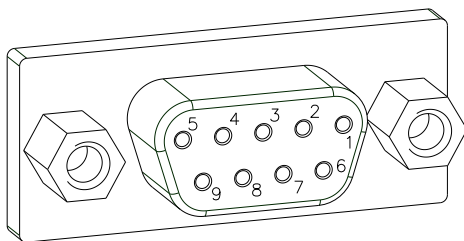
Output I
Figure 7, A

Figure 18

PIN (bushing)	Output I
9 (+) / 5 (-)	Out 1 / Port 9: Error message Each error status such as ribbon error is displayed.
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4 (+) / 3 (-)	Out 4 / Port 12: Layout print The content of print memory is transferred on the printable medium by means of the printhead.

Example   Connection of a lamp to a 24V relay by Out 1:

Figure 19

Output II
Figure 7, C
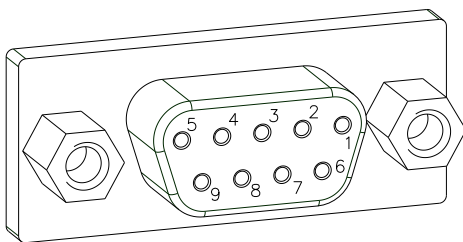
Figure 20

PIN (bushing)	Output II
9 (+) 5 (-)	Out 5 / Port 13: Print-Ready signal It is indicated if the print module is ready to process a start impulse. In contrary to the print order signal, the generating time is taken into consideration.
8 (+) 7 (-)	Out 6 / Port 14: Printhead up The printhead has reached the upper rest position (e.g. return to zero point).
6 (+) 2 (-)	Out 7 / Port 15: Return to start After termination of print procedure the flexible part of the print module is moved back to the start position. After the start position was reached a new start can be released.
4 (+) 3 (-)	Out 8 / Port 16: Prior warning of transfer ribbon end

Control inputs   By means of the control inputs it is possible to control printing. The control inputs at Input I are galvanic separated and have to be provided with an external tension source. The signal level is active "HIGH".

Input I
Figure 7, B

Figure 21

PIN (pin)	Input I
1 (+) 6 (-)	In 1 / Port 1: Print start
7 (+) 2 (-)	In 2 / Port 2: Not used
8 (+) 9 (-)	In 3 / Port 3: Reset external counter
4 (+) 3 (-)	In 4 / Port 4: Not used

Example   Connection of a switch with 24V voltage supply by In 1 / Port 1:
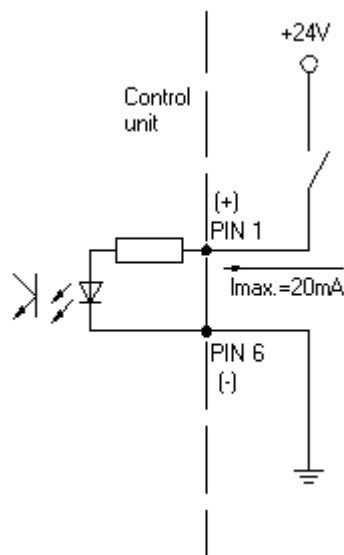
Figure 22

Input II
Figure 17, D
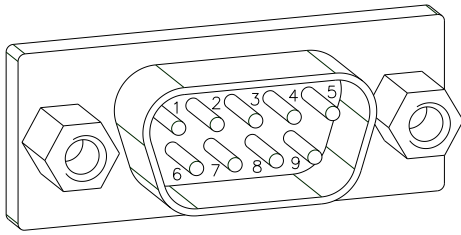
Figure 23

PIN (pin)	Input II
1 (+) ... 6 (-)	In 5 / Port 5: Not used
7 (+) ... 2 (-)	In 6 / Port 6: Not used
8 (+) ... 9 (-)	In 7 / Port 7: Not used
4 (+) ... 3 (-)	In 8 / Port 8: Not used

6.3   Registered functions/profiles for inputs/outputs

Select menu I/O Parameters / I/O Profile to select the desired profile.

List of registered functions for Std_Direct

Port	Function
1 (Input)	Print start
2 (Input)	Error reset
3 (Input)	Counter reset
4 (Input)	No function
5 (Input)	Reset error
6 (Input)	No function
7 (Input)	No function
8 (Input)	No function
9 (Output)	Error
10 (Output)	Active print order
11 (Output)	Generation
12 (Output)	Printing
13 (Output)	Ready
14 (Output)	Error
15 (Output)	Return
16 (Output)	Transfer ribbon prior warning

List of registered functions for StdFileSelDirect

Port	Function
1 (Input)	Print start
2 (Input)	Error reset
3 (Input)	Number of the file to load Bit 0 (Input)
4 (Input)	Number of the file to load Bit 1 (Input)
5 (Input)	Number of the file to load Bit 2 (Input)
6 (Input)	Number of the file to load Bit 3 (Input)
7 (Input)	Number of the file to load Bit 4 (Input)
8 (Input)	Number of the file to load Bit 5 (Input)
9 (Output)	error
10 (Output)	Active print order
11 (Output)	Generation
12 (Output)	Printing
13 (Output)	Ready
14 (Output)	Error
15 (Output)	Return
16 (Output)	Transfer ribbon prior warning

List of registered functions for SP_Direct0

Port	Function
1 (Input)	Print start
2 (Input)	Reset error
3 (Input)	Counter reset
4 (Input)	No function
5 (Input)	Error reset
6 (Input)	No function
7 (Input)	No function
8 (Input)	No function
9 (Output)	Ready
10 (Output)	No function
11 (Output)	No function
12 (Output)	No function
13 (Output)	Ready
14 (Output)	Error
15 (Output)	Return
16 (Output)	Transfer ribbon prior warning

List of registered functions for Old_Direct0

Port	Function
1 (Input)	Print start
2 (Input)	Reset error
3 (Input)	Counter reset
4 (Input)	No function
5 (Input)	No function
6 (Input)	No function
7 (Input)	No function
8 (Input)	No function
9 (Output)	Error
10 (Output)	Active print order
11 (Output)	Generation
12 (Output)	Printing
13 (Output)	Print-Ready
14 (Output)	Printhead down
15 (Output)	Return
16 (Output)	Transfer ribbon prior warning

6.4   Pin Assignment of Encoder Socket *

5-pin connecting bushing, contacts according to DIN 45322

connector socket
encoder
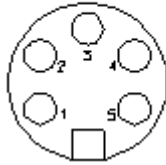
Figure 24

PIN1 = 5 VDC
PIN2 = Encoder signal (channel A)
PIN3 = Encoder signal (channel B)
PIN4 = GND

Electrical data of encoder

Operating voltage:	5 VDC
Output signal:	TTL level
Resolution:	Can be set at the print module

Connection of encoder
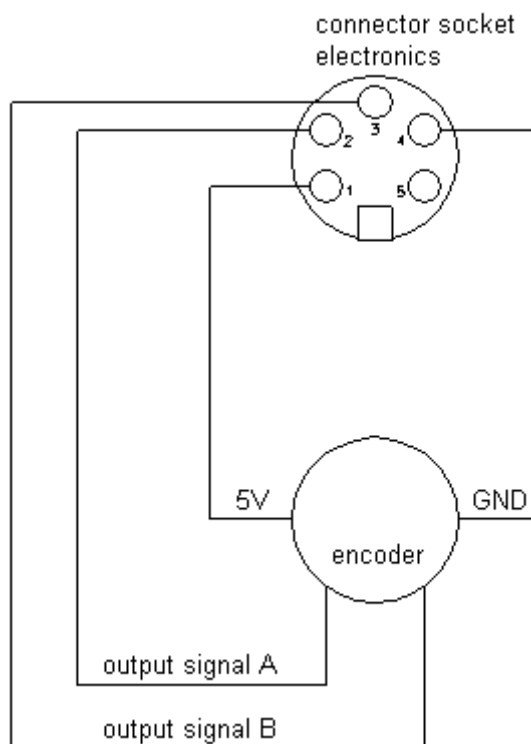
Figure 25

---

* only for continuous mode

7   Installation and Initial Operation

Unpack the direct print module

⟹   Lift the direct print module out of the box.

⟹   Check the direct print module for transport damages.

⟹   Set up the direct print module on a flat surface.

⟹   Remove foam transportation safeguards near the printhead.

⟹   Check delivery for completeness.

Scope of delivery

- Print mechanics.
- Control unit with cable.
- Connecting cable.
- Mini controller.
- Manometer.
- Pneumatic tube.
- Push-on connector.
- I/O accessories (mating connector for I/Os).
- 1 transfer ribbon roll.
- Empty core, mounted on transfer ribbon rewinder.
- Cleaning foil for printhead.
- Documentation.
- CD with printer drivers.

i   NOTICE!

Retain original packaging for subsequent transport.

7.1   Installation of Print Mechanics at Machines

i **NOTICE!**

With the open printing unit (due to construction) the requirements of EN60950-1 regarding fire protection casing are not fulfilled. These must be ensured by the installation into the end device.

Installation with mounting frame

At the bottom of the mounting frame are two M8 threads that can be used for the attachment at the machine. Additionally multi-functional connecting parts are supplied.

Please observe the following conditions:

- The maximum thread engagement of the M8 threads is 10 mm.

- The print mechanics has to be installed with a distance from printhead to brake stator of 1...2.5 mm (see illustration).

  i **NOTICE!**

  A distance of 2 mm is recommended.

- The best print results can be received if the silicon of the pressure roll consists of a hardness of approx. 40° to 50 ° Shore A and/or the elastometer of the counter-pressure plate shows a hardness of approx. 60 ± 5 Shore A (average value of roughness Ra ≥ 3,2 mm).

- The pressure roll/counter-pressure plate has to be installed parallel to the linear movement of print unit and the focal line of printhead. Discrepancies to the focal line and cavities in the print surface can lead to an inferior print quality at these positions.
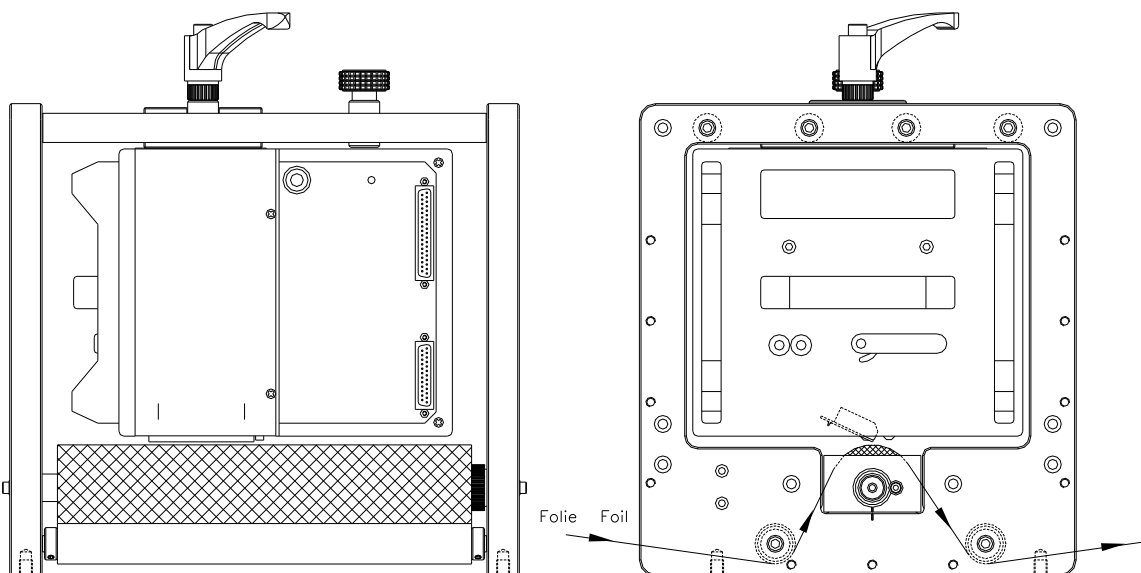
Figure 26

Installation without mounting frame

In case the machine is used without mounting frame, then it is possible to fix the print module from the top with four M6 screws.

The maximum thread engagement of the M6 threads is 6 mm (position of printhead see illustration).

7.2   Required Space for Cable Outgoing

**Standard:
Cable outgoing
sideways**
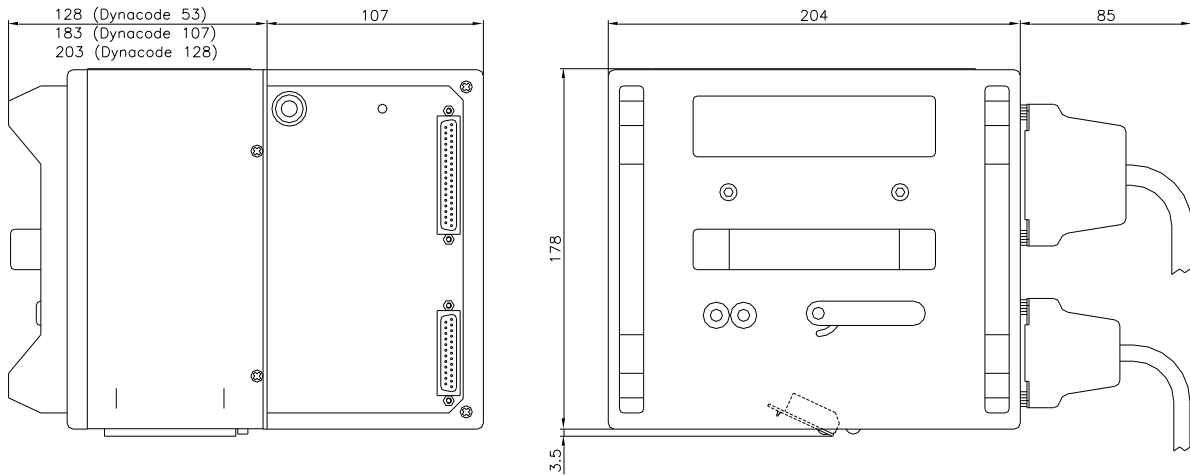
Figure 27

**Option:
Cable outgoing behind**
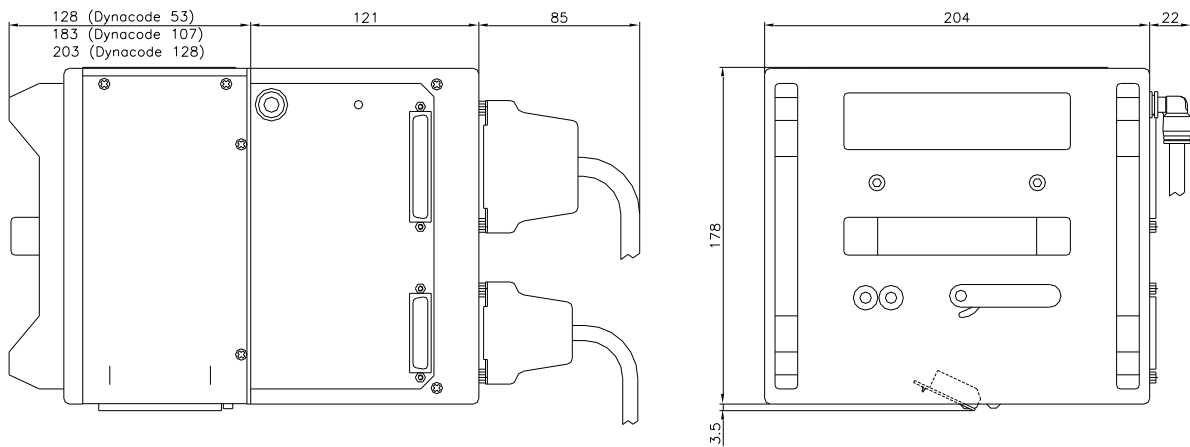
Figure 28

7.3   Connection of Pneumatic Power Supply

The pneumatic power supply for the printhead mechanics has to be made available a minimum continuous pressure of 4 - 6 bars in front of the pressure regulator. The maximum pressure in front of the pressure regulator is 7 bars and 4 bars after the pressure regulator.

NOTICE!

A pneumatic power supply of 4 bars is recommended.

The compressed-air has to be dry and oil free.

The supplied pressure regulator with manometer is to connect with a pneumatic tube Ø 8 mm via a plugging bolting to the pneumatic power supply. It is necessary to make a connection between the pressure regulator and the print mechanics via a pneumatic tube Ø 8 mm.

Please observe the following notes:

- Position pressure regulator as near as possible to the print mechanics.

- The pressure regulator is only to operate in the direction that is indicated on its underside. The direction shows the way of the streaming air.

- It is not allowed to bend the pneumatic tubes.

- Shortening of the pneumatic tubes has to be made with a clean right-angled cut without squashing the tube. If necessary use special tools (available in pneumatic requirements).

- Please observe a possible short length of the 8 mm pneumatic tubes.

Druckmechanik
Print mechanics

Pneumatikschlauch
Pneumatic tube 8x1

Druckregler mit Manometer
Pressure regulator with manometer

Druckluftversorgung
Pneumatic power supply
min. 4 bar, max. 7 bar
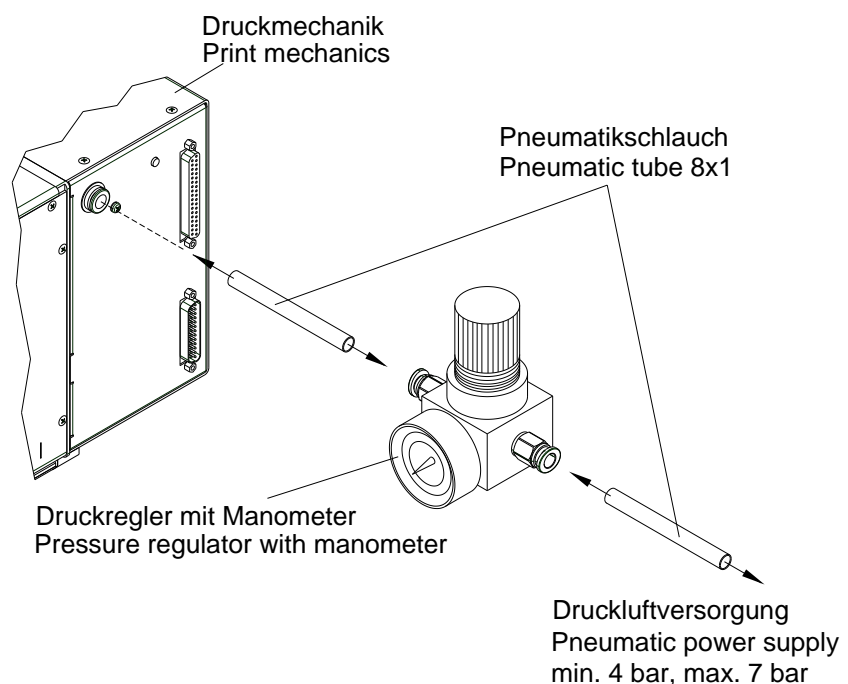
Figure 29

7.4   Adjustment of Pressure Power

Pressure power in dependence of air pressure c53 / i53 (one pressure cylinder)

Pressure power in dependence of air pressure c107 / i107 (two pressure cylinder)

Pressure power in dependence of air pressure c128 / i128 (two pressure cylinders)
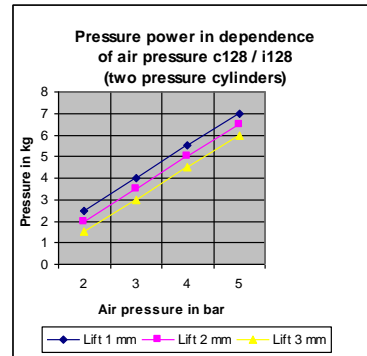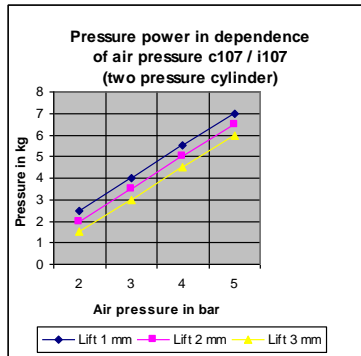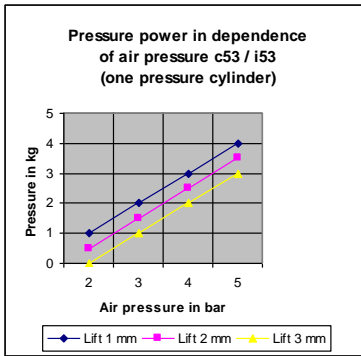
The pressure power of the printhead can be set with the pressure regulator. The values are indicated in the following table:

NOTICE!

If the pressure power is set too low then the printhead has no more contact to the counter-pressure plate. This damages the printhead due to the missing heat dissipation during the printout. In case of too low pressure an error message appears. This error message is to protect the printhead for overheating only and is not to use as print quality control (the control suffers with too low pressure, too).

The *Lift* indicates the distance between printhead and counter-pressure plate in idle mode of the device.

	DC II 53	DC II 107	DC II 128
Recommended pressure power	40 N	40 N	40 N
Max. pressure power	45 N	45 N	45 N

As the mechanical wear and tear of the printhead increases with the pressure power, the pressure power should be as low as possible.

7.5   Connecting the Direct Print Module

Connecting to the power supply

The direct print module is equipped with a versatile power supply unit. The device may be operated with a mains voltage of 110-230 V / 50-60 Hz without any adjustments or modifications.

> **!** **CAUTION!**
>
> The direct print module can be damaged by undefined switch-on currents.
>
> $\Longrightarrow$ Set de power switch to '0' before plugging in the direct print module.

$\Longrightarrow$ Insert plug of power cable into a grounded electrical outlet.

Connecting to a computer or to a computer network

> **i** **NOTICE!**
>
> Insufficient or missing grounding can cause faults during operation.
>
> Ensure that all computers and connection cables connected to the direct print module are grounded.

$\Longrightarrow$ Connect direct print module to computer or network with a suitable cable.

7.6   Before Initial Operation

- Mount print mechanics.
- Connect all cables between print mechanics and control unit.
- Protect cables against unintentional unscrewing.
- Install compressed air connection.
- Connect control unit and PC by direct print module interface.
- Connect control unit and packaging machine by inputs and outputs.
- Connect power cable of control unit.

7.7   Print Control

Because of the fact that the print module is always in control mode it is only possible to transmit and not to start print orders by the available interfaces (serial, parallel, USB or Ethernet). The print is started by a start signal to the 'print start-control input'. It is necessary for the control unit to recognise the moment of setting the start signal and therefore it is possible and also necessary to observe the print status by the outputs.

7.8   Initial Operation

Once all connections have been made:

$\Longrightarrow$ Switch on the control unit.

$\Longrightarrow$ Insert ribbon cassette (see chapter 8, page 41).
After loading the transfer ribbon cassette the measuring of transfer ribbon begins and the printhead is moved to the print position.

8   Loading the Transfer Ribbon Cassette

As for the electrostatic unloading the thin coating of the thermal printhead or other electronic parts can be damaged, the transfer ribbon should be antistatic.

The use of wrong materials can lead to direct print module malfunctions and the guarantee can expire.

i NOTICE!

Before a new transfer ribbon roll is loaded, the printhead must be cleaned using printhead and roller cleaner (97.20.002). For detailed information, please see page 82).
The handling instructions for the use of Isopropanol (IPA) must be observed. In the case of skin or eye contact, immediately wash off the fluid thoroughly with running water. If the irritation persists, consult a doctor. Ensure good ventilation.

8.1   Transfer Ribbon With Coating Outside

- Turn the lever (A) 90° in clockwise direction.

- Remove the ribbon cassette from the print mechanics by pulling handle (B).

- Load a new ribbon roll as far as it will go onto the unwinding roll (C).

- Load an empty cardboard roll as far as it will go onto the rewinding unit (D).

- Insert the ribbon according to illustration.

- Fix the ribbon with an adhesive tape at the empty roll and tighten it by some turns of the core.

- Push the ribbon cassette again onto print mechanics and take care that the ribbon not rip.

- Turn the lever (A) 90° anticlockwise.

Figure 30

i NOTICE!

The above illustration shows a left hand printing system. If you are using a right hand system, then the new roll is to be inserted at the left and the cardboard core is to be inserted at the right side.

8.2 Transfer Ribbon With Coating Inside
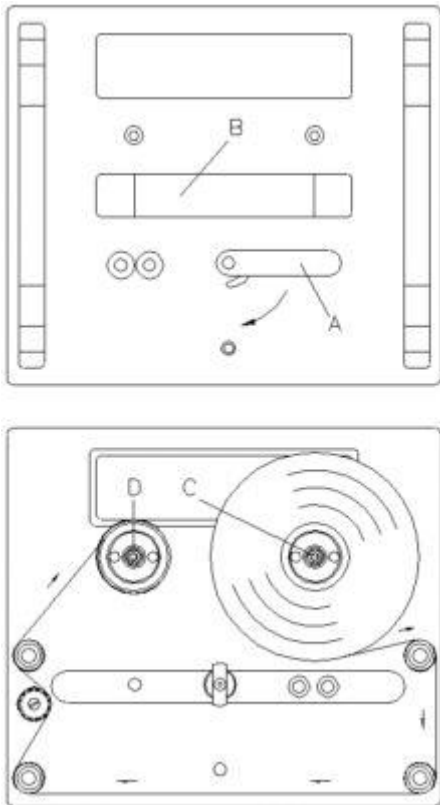
- Turn the lever (A) 90° in clockwise direction.

- Remove the ribbon cassette from the print mechanics by pulling handle (B).

- Load a new ribbon roll as far as it will go onto the unwinding roll (C).

- Load an empty cardboard roll as far as it will go onto the rewinding unit (D).

- Insert the ribbon according to illustration.

- Fix the ribbon with an adhesive tape at the empty roll and tighten it by some turns of the core.

- Push the ribbon cassette again onto print mechanics and take care that the ribbon not rip.

- Turn the lever (A) 90° anticlockwise.

Figure 31

NOTICE!

The above illustration shows a left hand printing system. If you are using a right hand system, then the new roll is to be inserted at the left and the cardboard core is to be inserted at the right side.

8.3   Increasing the Clamping Force for Ribbon Roll

NOTICE!

The use of high-quality transfer ribbon with a cardboard core is recommended. A sample ribbon roll is included in the scope of delivery. The clamping force of transfer ribbon roll placed on the rewinding/unwinding unit is designed for this quality.
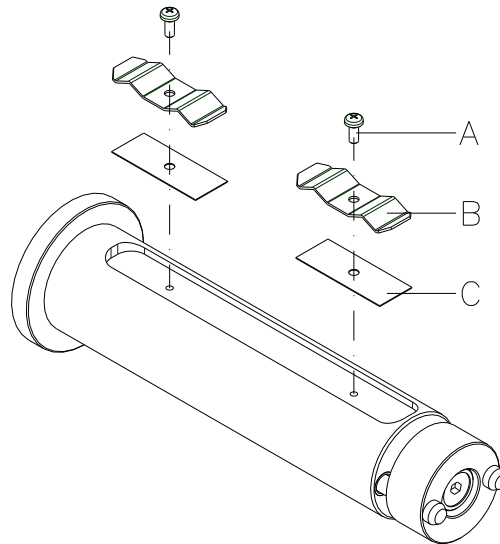
Figure 32

If other transfer ribbons are used, it can occur that the clamping force of the spring plates (B) is not sufficient, in order to position the rolls surely and to protect it against rotating.

When using transfer ribbons with plastic cores a safe positioning of the roles cannot be ensured.

CAUTION!

Slippage of transfer ribbon roll placed on the rewinding/ unwind unit or the empty cardboard core leads to malfunctions.

$\implies$ When using transfer ribbon rolls with plastic cores the groove must be shimmed.

Increasing the clamping force

- Remove screws (A) and spring plates (B).

- Insert the shims (C, included in delivery) into the groove.

- Fasten again spring plates (B) and shims (C) with screws (A).

- Insert transfer ribbon roll and empty cardboard core on the rewinding/unwinding unit.
  Check firm position!

9 Function Menu

9.1 Menu Structure (Continuous Mode)

Print Settings

- Contrast
- Transfer ribbon control
- X Offset

Machine Parameters

- Operating mode
- Print offset
- Print position
- Layouts/cycle
- Material speed control
- Encoder resolution
- Material feed
- Material speed

Layout Settings

- Print length
- Column printing
- Material selection
- Flip layout
- Rotate layout
- Alignment

Ribbon Save

- Operating mode
- Speed
- Transferband ribbon correction
- Distance/Number of cycles
- Expert parameters

Device Settings		Field handling
		Codepage
		External parameters
		Language
		Customized entry
		Hotstart
		Password protection
		Layout confirmation
		Print after measuring
		Standard layout

I/O Parameters		IN signal level
		OUT signal level
		Debounce
		Not ready: error
		I/O profile

Network		IP ddress
		Net mask
		Standard gateway
		Geschwindigkeit/duplex
		DHCP
		Printer name
		MAC address

Remote Console		Port
		Mode
		Interval

Interface		COM1
		Baud
		Parity
		Data bits
		Stop bit
		Start sign
		Stop sign
		Data memory
		Port test

Emulation
- Protocol
- Printhead resolution
- Drive mapping

Date/Time
- Set date/time
- Summertime
- Start of summertime - Format
- Start of summertime - Date
- Start of summertime - Time
- End of summertime - Format
- End of summertime - Date
- End of summertime - Time
- Time shifting

Service Functions
- Photocell parameters
- Paper counter
- Heater resistance
- Printhead temperature
- Transfer ribbon length
- Transfer ribbon winding
- Brake
- Print examples
- Input
- Output
- Encoder average
- Diagnostic counter
- Online/Offline
- Transfer ribbon prior warning
- Warning diameter

CF Card / USB Stick
- Load layout
- Change directory
- Load file
- Save layout
- Save configuration
- Delete file
- Formatting

9.2   Menu Structure (Intermittent Mode)

Print Settings		Speed
		Contrast
		Transfer ribbon control
		X Offset

Maschine Parameters		Operating mode
		Back speed
		Print offset
		Print position
		Layouts/cycle

Layout Settings		Print length
		Column printing
		Material selection
		Flip layout
		Rotate layout
		Alignment

Ribbon Save		Operating mode
		Transfer ribbon correction
		Expert parameters

Device Settings		Field handling
		Codepage
		External parameters
		Language
		Customized entry
		Hotstart
		Password protection
		Layout confirmation
		Print after measuring
		Standard layout

I/O Parameters	IN signal level
	OUT signal level
	Debounce
	Start signal delay
	Not ready: error
	I/O profile

Network	IP ddress
	Net mask
	Standard gateway
	Geschwindigkeit/duplex
	DHCP
	Printer name
	MAC address

Remote Console	Port
	Mode
	Interval

Interface	COM1
	Baud
	Parity
	Data bits
	Stop bit
	Start sign
	Stop sign
	Data memory
	Port test

Emulation	Protocol
	Printhead resolution
	Drive mapping

Date/Time
- Set date/time
- Summertime
- Start of summertime - Format
- Start of summertime - Date
- Start of summertime - Time
- End of summertime - Format
- End of summertime - Date
- End of summertime - Time
- Time shifting

Service Functions
- Photocell parameters
- Paper counter
- Heater resistance
- Printhead temperature
- Transfer ribbon length
- Transfer ribbon winding
- Brake
- Print examples
- Input
- Output
- Encoder average
- Diagnostic counter
- Online/Offline
- Transfer ribbon prior warning
- Warning diameter

CF Card / USB Stick
- Load layout
- Change directory
- Load file
- Save layout
- Save configuration
- Delete file
- Formatting

9.3   Print Settings

Speed
(intermittent
mode only)

Indication of print speed in mm/s (see Technical Data, page 19). The print speed can be determined for each print order anew.
The setting of print speed affects also the test prints.
Value range: 50 … 600 mm/s
Step size: 10 mm/s

Contrast

Indication of value to set the print intensity when using different materials, print speeds or printing contents.
Value range: 10% … 200 %.
Step size: 10%

Ribbon control

Examination if the transfer ribbon roll is empty and/or if the ribbon was torn at the unwinding roll.
Off: The ribbon control is deselected, i.e. the printer continues without an error message.
On: The ribbon control is selected, i.e. the current print order is interrupted and an Error Message appears at the printer display.
Strong sensibility: The printer reacts immediately to the end of the transfer ribbon.
Weak sensibility: The printer reacts at approx. 1/3 more slowly to the end of the transfer ribbon.

X displacement

Displacement of the complete print transverse to the paper direction.
The displacement is possible only up to the edges of the printing zone and is determined by the width of the focal line in printhead.
Value range: −90.0 … +90.0.

9.4   Machine Parameters (Continuous Mode)

Operating mode

It is not possible to start printing by the interface. The machine is always in control mode and the print is released by the control input *Print Start*. The operating mode is normally transferred with each layout otherwise mode *I/O dynamic continuous* is used as standard operating mode.

The following modes are available:

IO ST	**IO static**
	The input signal is evaluated, i.e. it is printed as long as the signal exists. The number of layouts, which was entered at print start, is printed (level evaluation of print start signal).
IO ST F	**IO static continuous**
	Corresponds to IO static. Continuous means that not only a defined number of pieces is processed but the same layout is printed as long as new data is transferred by interface.
IO DY	**IO dynamic**
	The external signal is evaluated dynamically, i.e. in case the direct print module is in 'waiting' mode a single layout is printed at each signal changing (flank evaluation of print start signal).
IO DY F	**IO dynamic continuous**
	Corresponds to IO dynamic. Continuous means that not only a defined number of pieces is processed but the same layout is printed as long as new data is transferred by interface.
Test mode	This operating mode corresponds to mode 2. After the return of the print unit to the zero point of the machine, however, internally a further cycle is started (endurance test).
Direct start	A print order is transferred. After termination of generating process the print order is executed without an external signal.

Print offset   Indication of distance of the layout (res. the first layout in case more layouts per cycles are to be printed) to the zero point of machine.

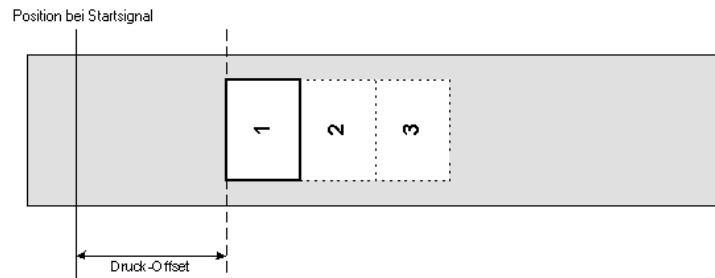Settings possible either in mm or ms.
Value range: 1 … 999 mm

Figure 33

Print position   Indication of position of print carriage in mm.
Value range: 12 … 93 mm

Layouts/cycle   Indication of number of printed layouts per print start (cycle).
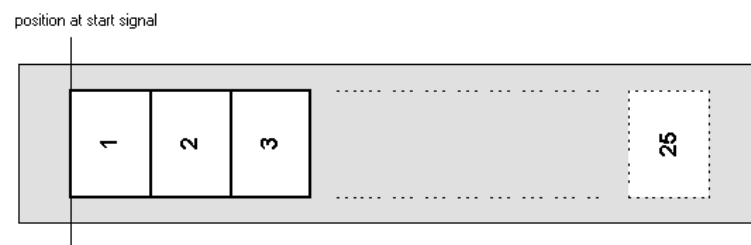Value range: 1 … 25.

Figure 34

Check speed on start   **Check material speed at print start signal**
Off (Default): Material speed is only checked if the set offset value is taken into consideration. It is possible to activate print start signal although the material is not yet in move. However, until the end the material speed has to be inside the valid speed sector as otherwise the print order is cancelled.
On: Material speed is checked at print start signal. Is the material speed outside of the valid speed sector then the start signal is ignored.

Resolution	**Encoder resolution / material feed per encoder rotation** Indication of resolution of used encoder and material feed per rotation of encoder in mm. These settings help measuring the material speed. The material feeding per encoder rotation corresponds for instance, in a 1:1 translation between the encoder and the roller, to the roller circumference.
Material speed	Indication of material speed (only for reading purposes).

9.5   Machine Parameters (Intermittent Mode)

Mode	**No. of pieces**	A print order with a defined number of pieces is transferred. After the generating process the target number and the actual number of pieces is shown in the display. A cycle is started via signal input 1 or with key [→]. With each cycle the actual number of pieces is increased by the number of printed layouts. In case the target number of pieces is reached the print order is finished and the display shows again the main menu.
	Continuous	A print order is transferred. After the generating process the number of printed layouts is shown in the display. A cycle is started via signal input 1 or with key [→]. With each cycle the number of printed layouts is increased. The print order is active as long as it is terminated by the user or in case of new data transmission.
	Test mode	This operating mode corresponds to mode 2. After the return of the print unit to the zero point of the machine, however, internally a further cycle is started (endurance test).
	Direct start	A print order is transferred. After termination of generating process the print order is executed without an external signal.
Back speed		Indication of back speed of print mechanics after print end in mm/s. Each cycle of the machine consists of printing and return to the zero point of machine. It is possible to set the print speed and back speed separately. Because of this value you can select for low machine clock cycles an operating method which saves the material and increases in this way the life of the printhead. Because of the mass moment of inertia it could be better to reduce the speed at an installation position of the print unit at >30° horizontal. Value range: 50 … 600 mm/s.

Print offset   Indication of distance of the layout (res. the first layout in case more
                                layouts per cycles are to be printed) to the zero point of machine.
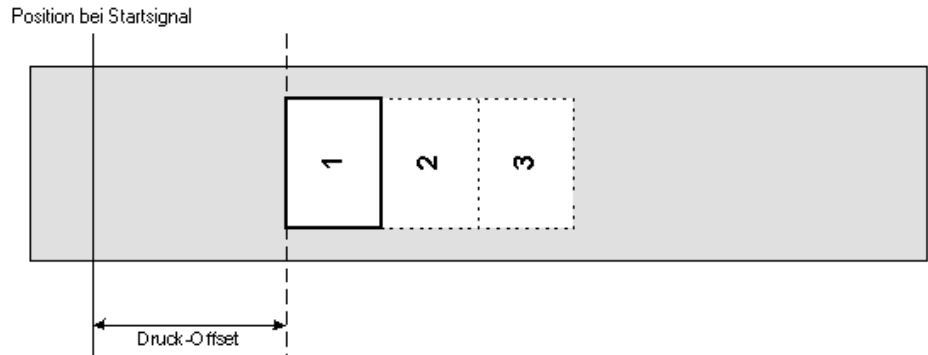   Value range: 0 … 93 mm
                                Default: 0 mm

Position bei Startsignal

Druck-Offset

Figure 35

Print position   Indication of start position of print carriage in mm.
                                Value range: 0 … 93 mm
                                Default: 83 mm

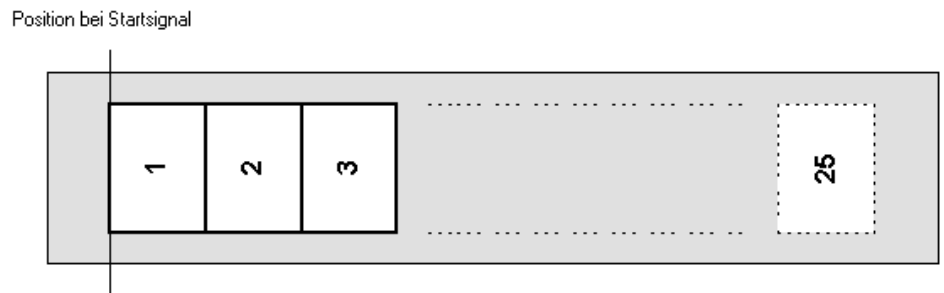**Layouts/cycle**   Indication of the number of printed layouts per print start (cycle).
                                Value range: 1 … 25.

Position bei Startsignal

Figure 36

9.6   Layout

Print length   Indication of way the print mechanics has to move. The print length depends on the length of the print mechanics.

Column printing   Indication of width of one layout as well as how many layouts are placed side by side on the backing paper.
With this print module, several columns can be printed, i.e. the information of one column can be printed several times (depending on its width) on a layout. Caused by this the use of the complete print width is possible and the generating time is enormously reduced.

Material selection   Selection of the used transfer ribbon material.

Flip layout   The axis of reflection is in the middle of the layout. If the layout width was not transferred to the direct print module, automatically the default layout width i.e. the width of the printhead is used. It is recommended to use layouts with the same width as the printhead. Otherwise this can cause problems in positioning.

Rotate layout   According to standard the layout is printed ahead with a rotation of 0°. If the function is activated, the layout is rotated by 180° and printed in reading direction.

Alignment   The adjustment of layout is effected only after *Flip/Rotate layout*, i.e. the adjustment is independent of the functions *Flip layout* and *Rotate layout*.

Left   =   The layout is aligned at the left-most position of printhead.

Centre   =   The layout is aligned at central point of printhead.

Right   =   The layout is aligned at right-most position of printhead.

9.7   Ribbon Save (Continuous Mode)

Mode

Off   No ribbon save.

Standard   Maximum ribbon save performance, i.e. with this
                setting there is no loss of transfer ribbon (apart from
                the safety distance of 1 mm, so the print fields are not
                printed one into the other).
                No settings are allowed with which the ribbon save no
                more cannot be achieved. This particularly applies for
                the print offset, which can only be adjusted now in the
                valid range (see chapter 15.2, page 110).

Shift   Layout data can be printed several times laterally
                displaced. A maximum utilization of transfer ribbon can
                be achieved (see chapter 15.3, page 112).

SaveStrt   No start signal loss, direct print module regulates the
                ribbon save quality automatically according to
                requirement.
                Automatic layout ribbon save and field ribbon save,
                each without feedback (see chapter 15.4, page 115).

Speed

Determination of max. print speed.
On the base of this value all necessary calculations e.g. feedback
distance and smallest possible print offset are being calculated.

Example

Speed = 400   Very good ribbon save result between
Mode = Standard   50 mm/s and 400 mm/s.

However, if you print with a speed higher than 400 mm/s, then the
ribbon save result is decreased and/or the ribbon save can no longer
be executed, because the back-feed way was designed to 400 mm/s.
Please consider: if speed is set to 400 and only 300 mm/s are printed,
then a smaller number of cycles is reached as if speed is set to 300,
however a reserve of 100 mm/s is still available.
Therefore the speed value should be always set to the maximum print
speed. If the number of cycles is not sufficient, the rewind correction
should be applied.

9.8   Ribbon Save (Intermittent Mode)

Mode

Off   No ribbon saving.

Standard   Maximum ribbon save performance, i.e. with this setting there is no loss of transfer ribbon (apart from the safety distance of 1 mm, so the print fields are not printed one into the other).
No settings are allowed with which the ribbon save no more cannot be achieved. This particularly applies for the print offset, which can only be adjusted now in the valid range (see chapter 15.5, page 115).

Shift   Layout data can be printed several times laterally displaced. A maximum utilisation of transfer ribbon can be achieved (see chapter 15.6, page 116).

9.9   Device Settings

Field handling

Off: The complete print memory is deleted.
Keep graphic: A graphic res. a TrueType font is transferred to the direct print module once and stored in the direct print module internal memory. For the following print order only the modified data is transferred to the direct print module. The advantage is the saving of transmitting time for the graphic data.
The graphic data created by the direct print module itself (internal fonts, bar codes, ...) is generated only if they were changed. The generating time is saved.
Delete graphic: The graphics res. TrueType fonts stored in the internal memory is deleted but the other fields are kept.

Codepage

Indication of the font used in the direct print module.
The following possibilities are available:

Codepage 1252 West European (former ANSI)

Codepage 437 English

Codepage 850 Western European

Codepage 852 Slavic

Codepage 857 Turkish

Codepage 1250 Central and East European

Codepage 1251 Cyrillic

Codepage 1253 Greek

Codepage 1254 Turkish

Codepage 1257 Baltic

WGL4

Please find the tables referring to the above mentioned character sets on www.carl-valentin.de/Downloads.

External parameters   **Layout dimension only:** The parameters for layout length, gap length and layout width can be transferred to the printing system. All other parameter settings are to be made directly at the printing system.
On: Sending parameters such as speed and contrast via our design software to the printing system. Parameters which are set directly at the printing system before are no longer considered.
Off: Only settings made directly at the printing system are considered.

Language   Selection of language the display indicates texts in the graphic display.
At the moment the following languages are available: German, English, French, Spanish, Portuguese, Dutch, Italian, Danish, Finnish, Polish, Czech, Hungarian, Russian, Chinese (option), Ukrainian.

Customized entry   **On:** The question referring the customized variable appears once before the print start at the display.
Auto: The question referring the customized variable appears after every printed layout.
Off: No question appears at the display. In this case the stored default value is printed.

Hotstart   **On:** Continue an interrupted print order after switching on the printer anew
Off: No question appears at the display. In this case the stored default value is printed 14.1, page 105).

Password protection   By a password several functions can be blocked, so the user cannot work with them. There are several applications in which the use of password protection makes sense (see chapter 14.2, page 107).

Layout confirmation   **On:** A new print order is only printed after confirmation at the device. An already active continuing print order is printed as long as the confirmation is effected at the device.
Off: No query appears at the display of control unit.

D/Me   **Print after measuring**
On: If an error occurred during printing, whose removal can be recognized by the module (e.g. transfer ribbon end, cassette open), then the module changes after the error correction (e.g. cassette closed again) immediately in the 'ready' mode.
Off: After removal and confirmation of error, the module changes into 'stopped' mode.

Standard layout   **On:** If a print order is started without previous definition of layout, the standard layout is printed.


```
POS 108/12 R
V1.50 (Build 0001 )

NO LABEL DATA
```

Off: If a print order is started without previous definition of layout, an error message appears in the display.

9.10 I/O Parameters

IN signal level   Indication of signal at which a print order is started

+   =   active signal level is 'high' (1)

-    =   active signal level is 'low' (0)

x   =   signal level is not activated

s   status can be affected by interface [*]

The modification of the signal level is only taken into consideration for the operating modes I/O static, I/O dynamic, I/O static continuous and I/O dynamic continuous.

OUT signal level   Angabe des Signalpegels für Ausgabesignal.

+   =   active signal level is 'high' (1)

-    =   active signal level is 'low' (0)

s   =   status can be affected by interface *

Debounce   Indication of debounce time of the dispenser input. The setting range of the debounce time is between 0 and 100 ms.
In case the start signal is not clear then you can debounce the input by means of this menu item.

Start signal delay   Indication in time per second of the delay for the start signal.
(intermittent mode)   Value range: 0.00 … 9.99.

Not ready: error   **On:** If a print order is active but the direct print module is not ready to process the order (e.g. if it is already in 'printing' mode), then an error message appears.
Off: No error message appears.

I/O Profile   Selection of the available configurations *Std_Direct* (factory setting), *StdFileSelDirect, SP_Direct0 or Old_Direct0*.
The corresponding assignment is indicated in chapter 6.3, page 30.

9.11 Network

For more information, please see the separate manual.

---

[*] in combination with Netstar PLUS

9.12 Remote Console

For more information please contact our sales department.

9.13 Interface

COM1 / Baud / P / D / S

COM1:
0 - serial interface Off.
1 - serial interface On.
2 - serial Interface On, no error message occurs in case of a transmission error.

Baud:
Indication of bits which are transferred per second (speed of data transfer).
Value range: 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.

P = Parity:
N - No parity
E - Even
O - Odd
Please observe that the settings correspond to those of the direct print module.

D = Data bits:
Setting of data bits.
Value range: 7 or 8 Bits.

S = Stop bits:
Indication of stop bits between bytes.
Value range: 1 or 2 stop bits.

Start sign / End sign

SOH: Start of data transfer block → Hex format 01
ETB: End of data transfer block → Hex formal 17
Two different start / en signs can be set. The settings are normally SOH = 01 HEX and ETB = 17 HEX. Several host computers cannot process these signs and therefore SOH = 5E HEX and ETB = 5F cannot be set.

Data memory

Standard: After starting a print order the direct print module buffer receives data as long as it is filled.
Advanced: During a current print order data is received and processed.
Off: After starting a print order no more data is received.

Porttest

Check whether the data are transferred via the interface.

9.14 Emulation

Protocol

CVPL: Carl Valentin Programming Language
ZPL: Zebra[®] Programming Language
Change between CVPL protocol and ZPL II[®] protocol.

The direct print module performs a restart and ZPL II[®] commands are transformed into CVPL commands internally by the direct print module and then executed by the direct print module.

Printhead resolution

At activated ZPL II[®] emulation the printhead resolution of the emulated direct print module must be set, e.g. 11.8 Dot/mm (= 300 dpi).

i **NOTICE!**

If the printhead resolution of the Zebra[®] printer differs from that of the Valentin device, then the size of objects (e.g. texts, graphics) complies not exactly.

Drive mapping

The access to Zebra[®] drives
B: CF card
R: RAM Disk (standard drive, if not indicated)

is rerouted to the corresponding Valentin drives
A: CF
R: RAM Disk

This can be necessary if the available space on the RAM disk (at present. 512 KByte) is not sufficient or if bitmap fonts are downloaded to the direct print module and be stored permanently.

i **NOTICE!**

As the printer build-in fonts in Zebra[®] printers are not available in Valentin devices, this can cause small differences in the text image.

9.15 Date & Time

**Setting of
date and time**

The upper line of display shows the current date, the second line the current time.

Summertime

On: Module automatically adjust clock for daylight saving changes.
Off: Summertime is not automatically recognized and adjusted.

**Start of summertime –
Format**

Select the format in which you want to define beginning summertime. The above example indicates the default setting (European format).

DD	Day
WW	Week
WD	Weekday
MM	Month
YY	Year
next day	only next day is taken into consideration

**Start of summertime –
Date**

By means of this function you can enter the date at which summertime has to start. This entry refers to the previously selected format. Example: summertime is automatically adjusted at last Sunday in March (03).

**Start of summertime –
Time**

By means of this function you can define the time when you want to start summertime.

**End of summertime –
Format**

Select the format in which you want to define end of summertime. The example above indicates the default setting (European format).

**End of summertime –
Date**

By means of this function you can define the date when you want to stop summertime. The entry refers to the previously selected format. Example: summertime is automatically adjusted at last Sunday in October (10).

**End of summertime –
Time**

By means of this function you can define the time when you want to stop summertime.

Time shifting

By means of this function you can enter time shifting in hours and minutes (for automatically adjustment from summer and wintertime). This entry refers to the direct print module time set currently.

9.16 Service Functions

NOTICE!

So that the distributor res. the direct print module manufacturer in case of service can offer fast support all necessary information such as selected parameters can be taken directly from the device.

Photocell parameters

H = Cover switch
Only available at devices with cover switch.
0 = oper cover
1 = closed cover

P = Pressure
Indication of value 0 or 1 or compressed air control.

R1 = Transfer ribbon rewinding roll
Indication of transfer ribbon rewinding roll status.
4 states are indicated (no marking in photocell, marking from right, marking from left, marking completely in photocell).

R2 = Transfer ribbon unwinding roll
Indication of transfer ribbon unwinding roll status.
4 states are indicated (no marking in photocell, marking from right, marking from left, marking completely in photocell).

C = Carriage
Indication of print carriage position.

ENC = Encocer
Indication of current state of encoder

Laufleistung

D: Indication of printhead attainment in meters.
G: Indication of direct print module attainment in meters.

Heater resistance

To achieve a high print quality, the indicated Ohm value must be set after an exchange of printhead.

Printhead temperature

Indication of printhead temperature. The printhead temperature corresponds normally to the room temperature. In case the maximum printhead temperature is exceeded, the current print order is interrupted and an error message appears at the direct print module display.

Ribbon

Selection of the used transfer ribbon length (300 m, 450 m, 600 m, 900 m or 1000 m). With smaller ribbons, a higher number of cycles can be reached.

Ink side

Selection of the coating side of transfer ribbon, either outside or inside.
Default: Coating outside

Brake Power   Adjustment of brake power for acceleration and braking in %.

Brake Power P   Adjustment of brake power during printing.

Print examples   Settings   =   Printout of all settings such as speed, and transfer
                                                     ribbon material.

                             Bar codes   =   Printout of all available bar code types.

                             Fonts   =   Printout of all available font types.

Input   Indication of level for inputs of the IO parameters.
                             0 = Low
                             1 = High

Output   Indication of the level for outputs of the IO parameters.
                             0 = Low
                             1 = High

Diagnostic:

Encoder Profiling   The encoder values with print start in logging files are registered on
                             CF card. By means of this data, a graphic chart of the encoder curve
                             can be created.
                             For further information please contact our support department.

Diameters of transfer   **DiaRW** = Diameter of transfer ribbon rewinding roll.
ribbon rolls   **DiaRU** = Diameter of transfer ribbon unwinding roll.

Encoder average   Number of values by which the encoder signals is averaged. The
                             more higher the value the more slowly react the device to speed
                             modifications.

I/O Status   Relevant results are counted and registered in RAM memory. The
                             protocole get lost after switching off the device.

                             RInt = Real Interrupts
                             The start input impulses are counted directly at the Interrupt.

                             Dbnc = Debounced
                             The start input impulses that are longer than the set debounce time
                             are counted. Only these start impulses can lead to a print. If a start
                             impulse is too short, no print is released. This is recognized by the fact
                             that RInt is counted, Dbnc not.

                             NPrn = Not Printed
                             The debounced start input impulses that have not lead to a print are
                             counted. Causes: no active print order, print order stopped (manually
                             or because of an error) or the printing system ist still active with the
                             processing of a print order.

                             PrtStrtReset = The counters are reset.

                             PrtStrtTime = Measured length of the last start impulse in ms.

Online / Offline   This function is activated e.g. if the transfer ribbon is to be changed. It is avoided that a print order is processed although the module is not ready. The respective state is indicated in the display.
Standard: Off

Online: Data can be received by interface. The keys of the touch-screen are only active, if you changed in the Offline mode.
Offline: The keys of the touch-screen are still active but received data are not processed. If the module is again in Online mode then new print orders can be again received.

Transfer ribbon   Before the end of transfer ribbon, a signal is send by the control
advance warning   output.

Warning diameter   Setting of transfer ribbon advance warning diameter.
In case you enter a value in mm then a signal appears via control output when reaching this diameter (measured at transfer ribbon roll).

9.17 Main Menu

Switch on the direct print module and the display shows the Home screen

Press button to display information such as module type, current date and time, version number of firmware and used FPGA.

10   Touch-Screen Display

10.1 Touch-Screen Display Structure

The touch-screen display shows an intuitive graphic user interface with well-defined symbols and buttons.

The touch-screen display informs about the current device status and status of the print order, alerts in case of an error and indicates the device settings in the menu.

The desired settings are made by selecting the buttons on the touch-screen display.
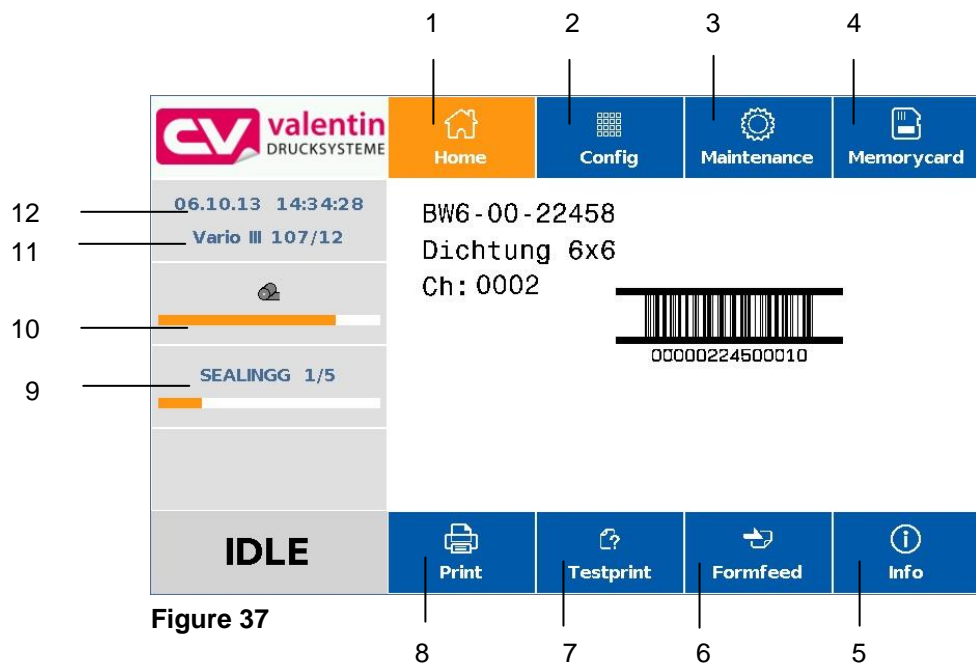
Figure 37

1	Home screen
2	Selection of parameter settings
3	Setting of maintenance parameters
4	Memory card menu access
5	Indication of device information
6	Starting layout feed
7	Starting test print
8	Starting print job
9	Name of currently selected layout Number of printed layouts / total amount
10	Transfer ribbon status
11	Device name (indicated in network)
12	Current date and time

10.2 Different Menus

Indication of main menus
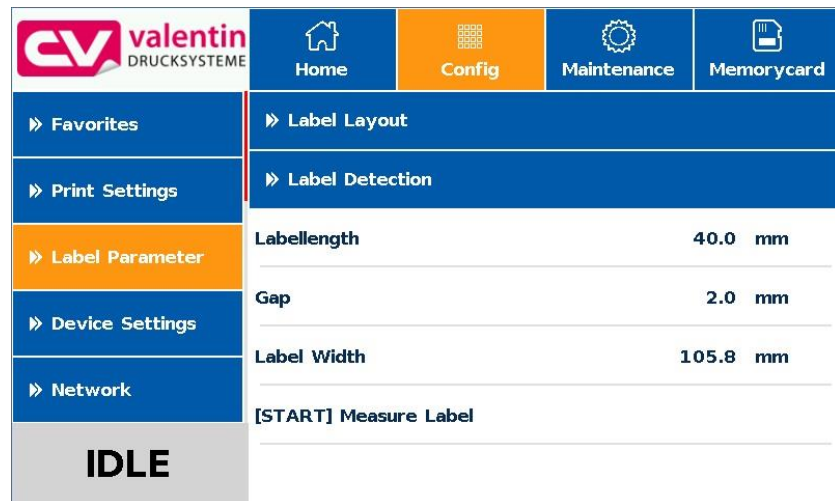
Figure 38

The selected (active) menu is highlighted on orange background.

If a selected menu contains so-called submenus, these are blue highlighted.

Indication of submenus

Different parameters are combined in a submenu.

Figure 39

The left display side shows the available submenus. The currently selected (active) submenu is highlighted on orange background.

Press ![icon] to return one level.

Press ![icon] to change to the start screen at any time.

10.3 Favorites List
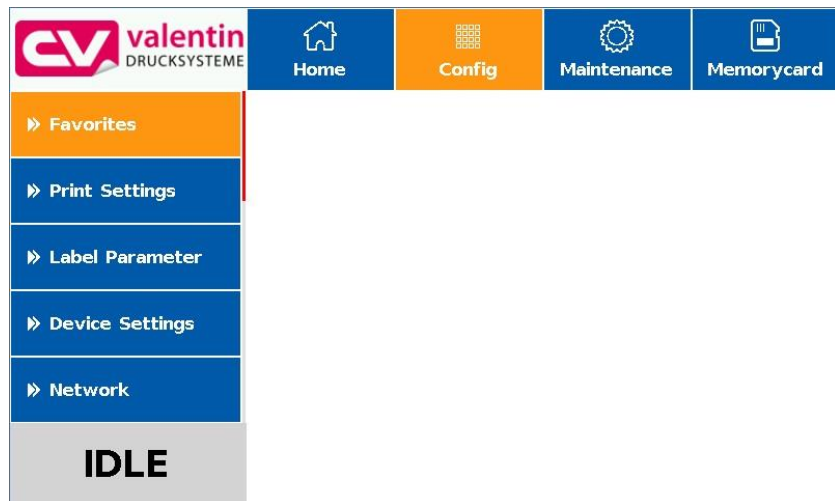
Figure 40

Press **Functions** to display the a **Favorites** zone in the first place. The user can store the most important parameters for his application to have a fast as possible access.

Add parameters to favorites
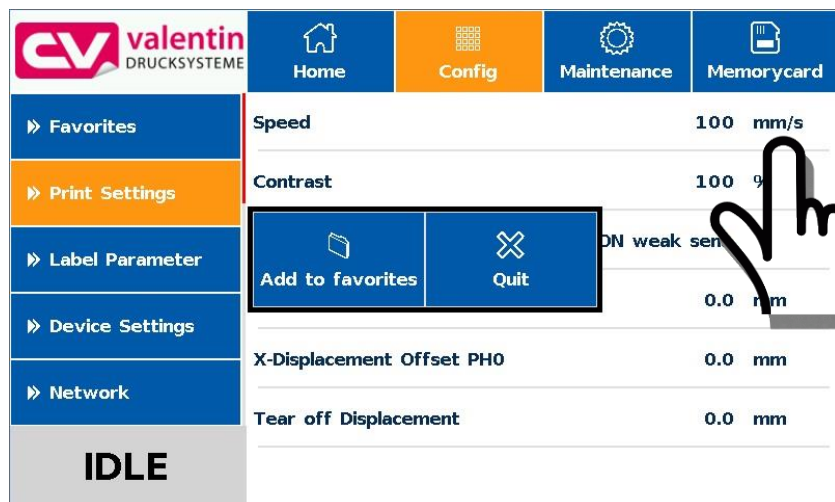
Figure 41

Press long (2 s) on a parameter (e.g. print speed) to display the appropriate selection.

Press *Add to favorites* to add the selected parameter to the favorites list.
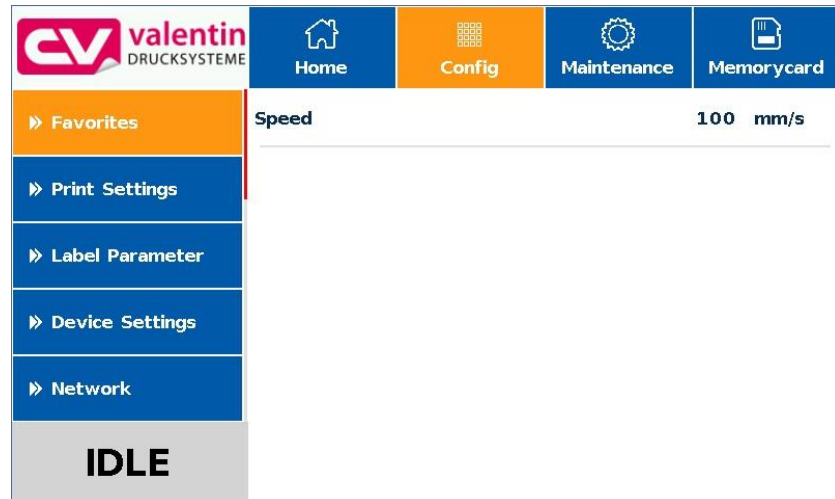
Figure 42

Remove parameters from favorites
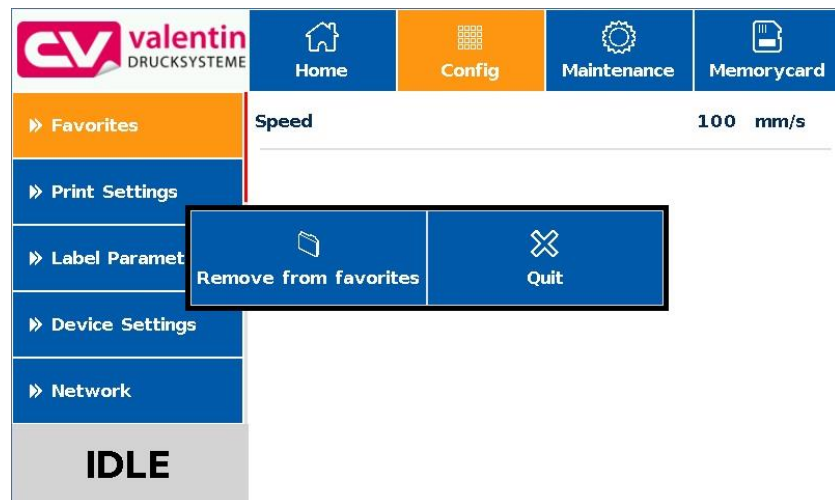
Figure 43

Press long (2 s) on a parameter (e.g. print speed) to display the appropriate selection. Press *Remove from favorites* to remove the selected parameter from the favorites list.

10.4 Parameter Input

Parameter input

Figure 44

Numeric input

Figure 45

In the header of input dialog the name of the parameter and the permissible value range are shown. The input is checked for validity. If the entered value not permissible, the button ![button] is blocked.

Selection from list

Figure 46

Alphanumeric input

Figure 47

10.5 Navigation Zones

Position   Position
indication   indication
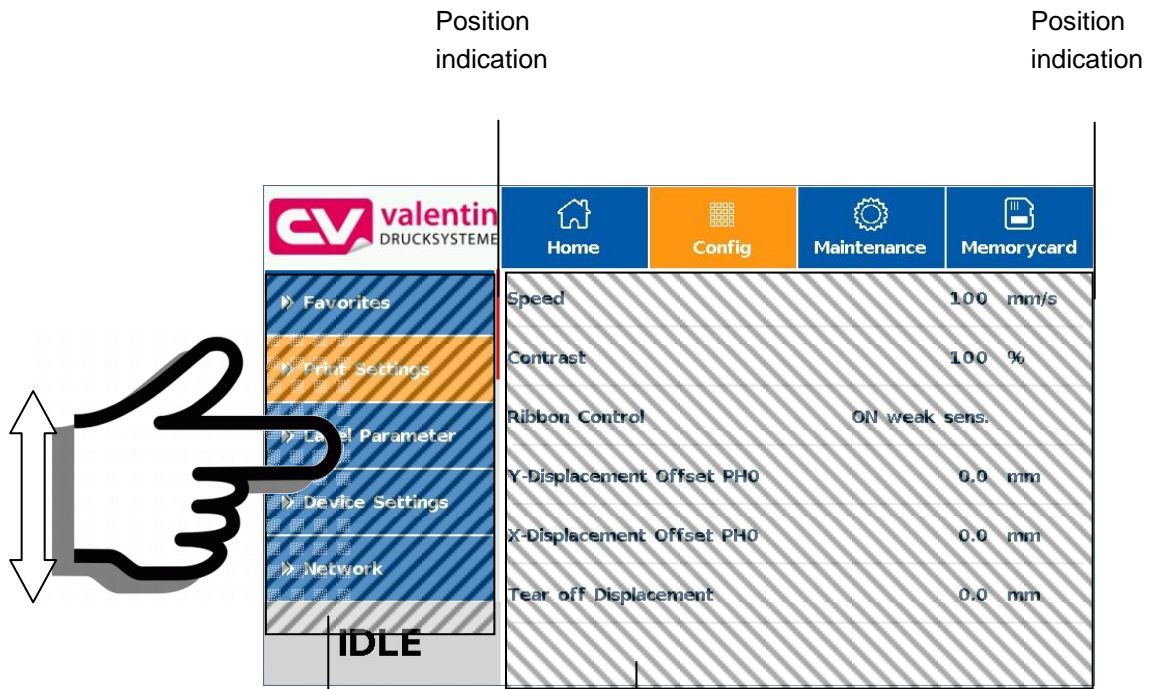
Figure 48

Navigation   Navigation
zone 1   zone 2

The respective navigation zone can be moved with an appropriate
swipe movement from top to bottom or from the bottom up.

> **NOTE!**
>
> With the used resistive touch screen variant a certain pressure
> on the display is needed.
> It is not possible to navigate on the display with the swipe
> movement to the left and right with a finger (well-known from
> smartphones).

The position indications signalise the detail of the total list currently
visible. If no position indication is visible then the total list can be
displayed on the display. A swipe movement from top to bottom
and/or from the bottom up is not possible.

10.6 Maintenance Zone

Different settings for the display indication can be done.

Maintenance - Print preview
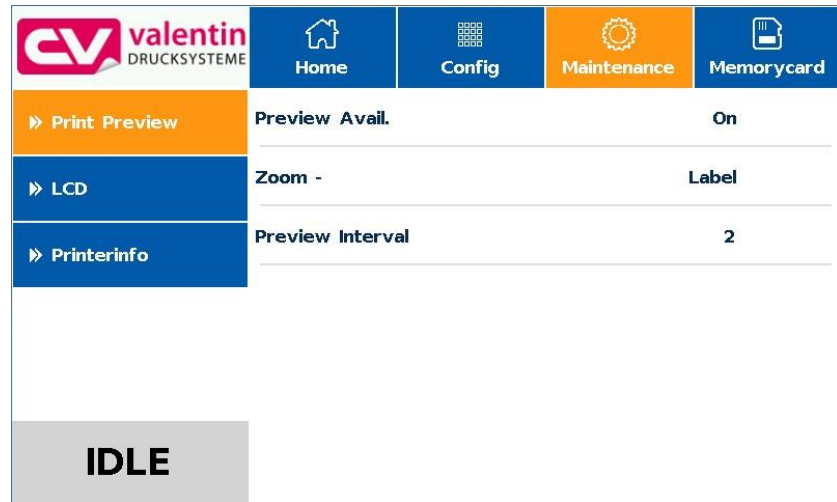
Figure 49

Print preview activated On/Off
With activated print preview a picture of the currently printed layout is shown on the display. If the function is not activated, the field remains empty.
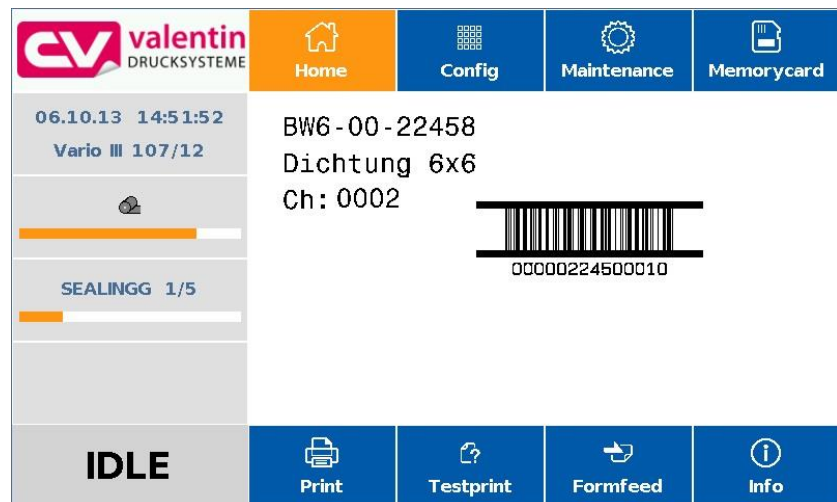
Figure 50

Zoom
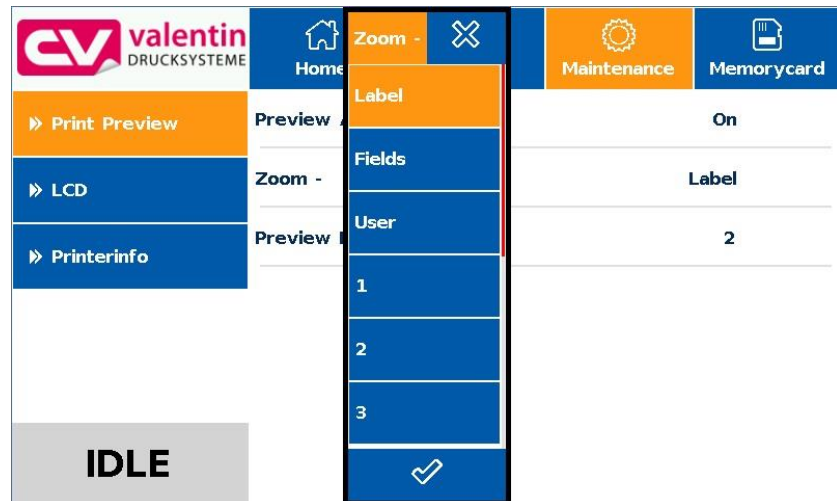Selection of a certain zoom value for the representation of print preview.

Figure 51

Label: The complete layout is fit to the indication zone.

Fields: Only the print range is fit to the indication zone.

User: A freely defined zone is fit to the indication zone (see Labelstar Office).

1 .. 8: Manual zoom factor to scale the complete layout down.

Preview Interval
During a running print order the preview is refreshed in the set interval.
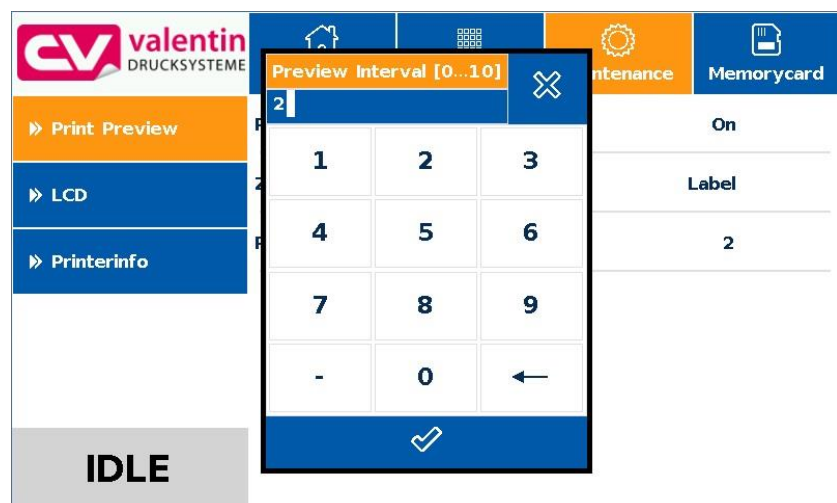
Figure 52

Value range: 0 .. 10 seconds

Maintenance - LCD
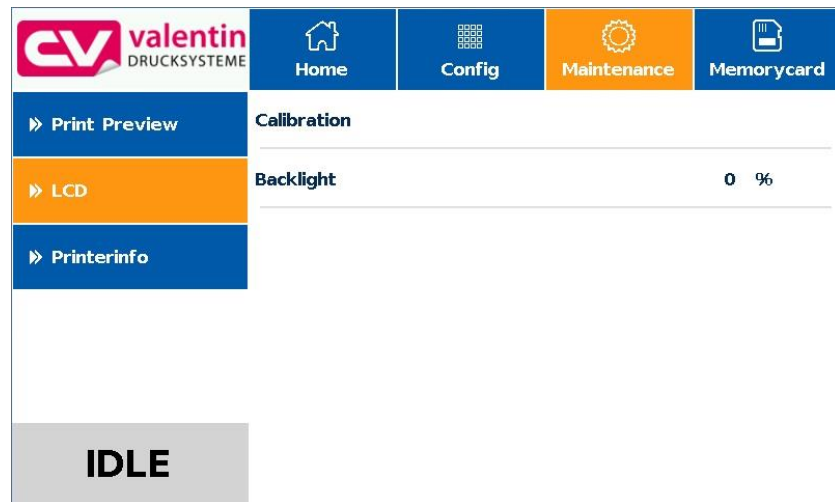
Figure 53

Calibration:
The touch screen display is calibrated, i.e. the position of printhead is adjusted.

Figure 54

For the start of calibration the display must be touched at any position. Afterwards three red points are shown successively and you have to touch them as exact as possible. The calibration is finished with it.

Background light:
Setting of contrast of background lighting.
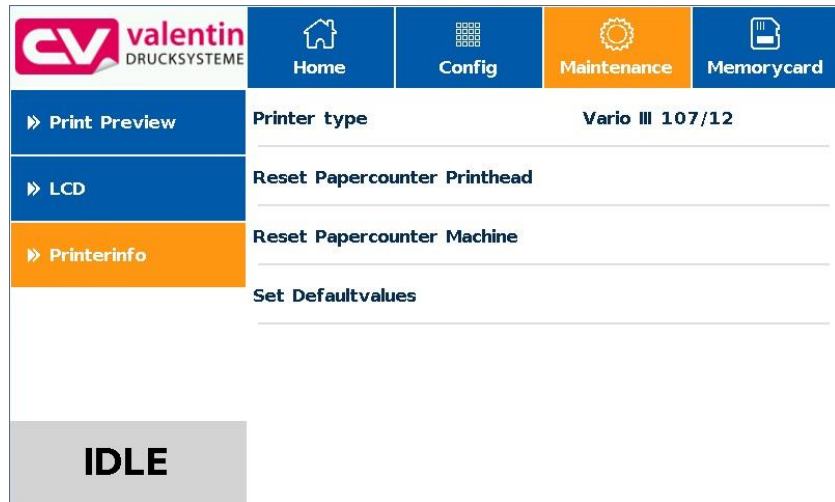Value range: 0 .. 100%.

Maintenance - System settings

Figure 55

Different system settings such as set printer type, reset paper counter etc. can be made.

However, for the settings the corresponding password is necessary.

Figure 56

10.7 Memory Menu

**Compact Flash Card
USB Stick**

Figure 57

1	Contents of current directory
2	Loading of selected layout and starting the print job
3	Preview zone If available, a preview of the selected layout is displayed
4	Changing to the file manager (Explorer)

Input of variables
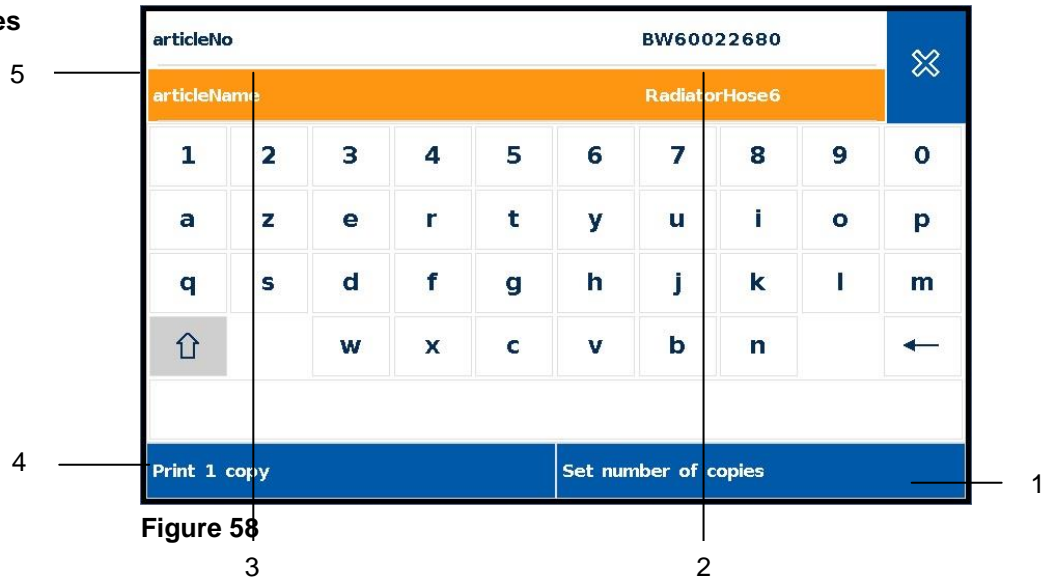
Figure 58

1	Change the number of copies
2	Value of defined variable
3	Customer query
4	Quick start of printout
5	List of variables defined on the layout

Number of copies

Figure 59

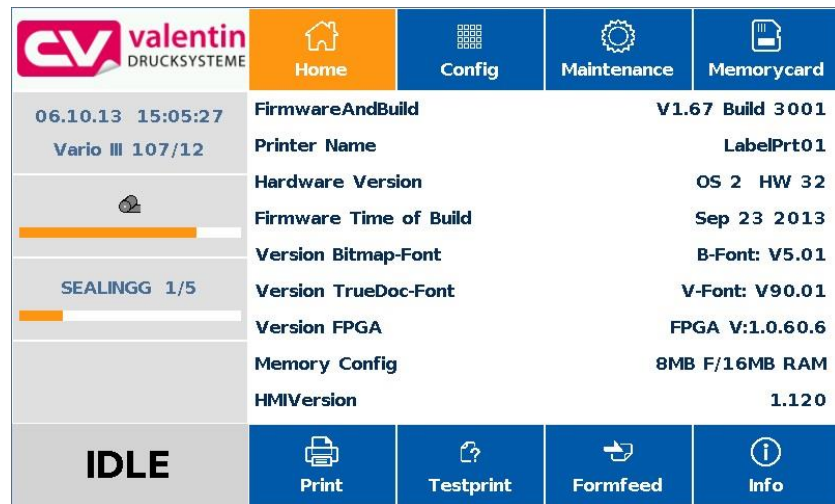Enter the number of layouts to be printed.

10.8 Information Zone

Figure 60

By pressing the **Info** button the versions of the installed components are displayed.

10.9 Change to Foil Keyboard

Press long (> 3 s) on the company logo left above, and the display changes to the indication of a conventionalize foil keyboard. The settings can be done by the standard operating panel (see page 45). Press [⊠] to change to the previous view.
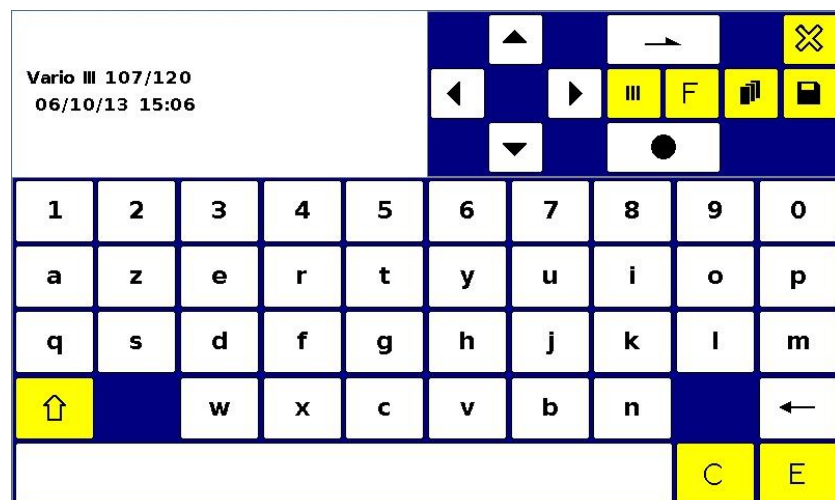

Figure 61

For more information about the use of printer and its foil keyboard can be found in chapter 9.

11   Maintenance and Cleaning

DANGER!

Risk of death by electric shock!

$\Longrightarrow$ Disconnect the direct print module from power supply before performing any maintenance work.

NOTICE!

When cleaning the label printer, personal protective equipment such as safety goggles and gloves are recommended.

Maintenance chedule

Maintenance task	Frequency
General cleaning (see chapter 11.1, page 81).	As necessary.
Cleaning transfer ribbon roller (see chapter 11.2, page 82).	Each time the transfer ribbon is changed or when the printout is adversely affected.
Cleaning printhead (see chapter 11.3, page 81).	Each time the transfer ribbon is changed or when the printout is adversely affected.
Replacing printhead (see chapter 11.4, page 83).	In case of errors in printout.

NOTICE!

The handling instructions for the use of Isopropanol (IPA) must be observed. In the case of skin or eye contact, immediately wash off the fluid thoroughly with running water. If the irritation persists, consult a doctor. Ensure good ventilation.

11.1 General Cleaning

CAUTION!

Abrasive cleaning agents can damage the direct print module!

$\Longrightarrow$ Do not use abrasives or solvents to clean the outer surface of the direct print module.

$\Longrightarrow$ Remove dust and paper fuzz in the printing area with a soft brush or vacuum cleaner.

$\Longrightarrow$ Clean outer surfaces with an all-purpose cleaner.

11.2 Cleaning the Transfer Ribbon Roller

A soiled print roll can lead to reduced print quality and can affect transport of material.
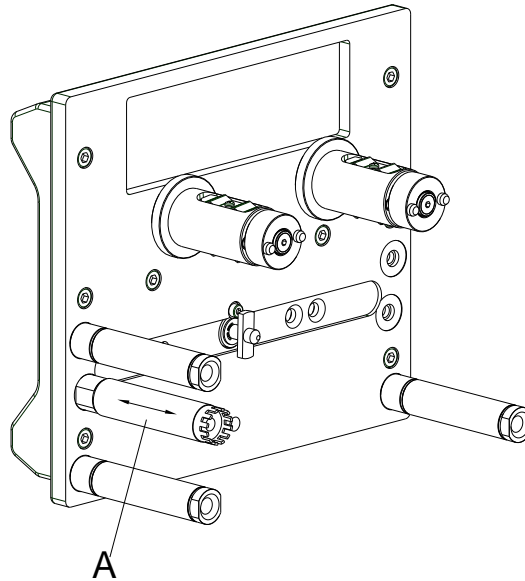

Figure 62

Remove transfer ribbon cassette.

Remove deposits with roller cleaner and a soft cloth.

If the roller (A) appears damaged, replace it.

11.3 Cleaning the Printhead

Printing can cause accumulation of dirt at printhead e.g. by colour particles of transfer ribbon, and therefore it is necessary to clean the printhead in regular periods depending on operating hours, environmental effects such as dust etc.

> **!** **CAUTION!**
>
> Printhead can be damaged!
>
> $\Longrightarrow$ Do not use sharp or hard objects to clean the printhead.
>
> $\Longrightarrow$ Do not touch protective glass layer of the printhead.

1. Remove transfer ribbon cassette.

2. Clean printhead surface with special cleaning pen or a cotton swab dipped in pure alcohol.

3. Allow printhead to dry for 2-3 minutes before commissioning the device.

11.4 Replacing the Printhead

! **CAUTION!**

The printhead can be damaged by static electricity discharges and impacts!

⇒ Set up the device on a grounded, conductive surface.

⇒ Ground your body, e.g. by wearing a grounded wristband.

⇒ Do not touch contacts on the plug connections (2, 3).

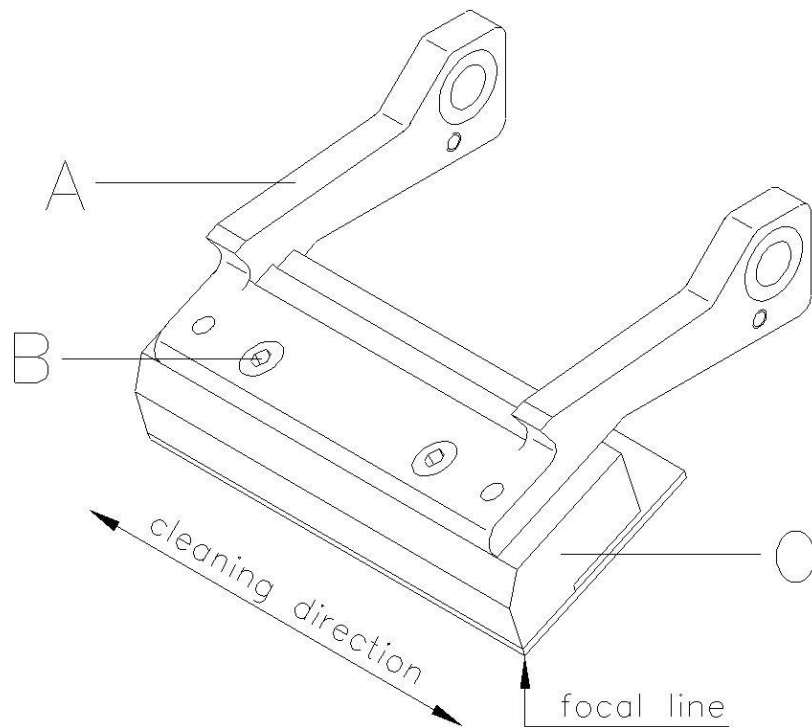⇒ Do not touch the printhead with hard objects or your hands.

Figure 63

Removing the printhead

1. Remove ribbon cassette.

2. Move printhead unit in an appropriate service position.

3. Press printhead support (A) slightly downwards until an Allen key (2.5) can be inserted in the screws (B).

4. Remove screws (B) and afterwards the printhead (C).

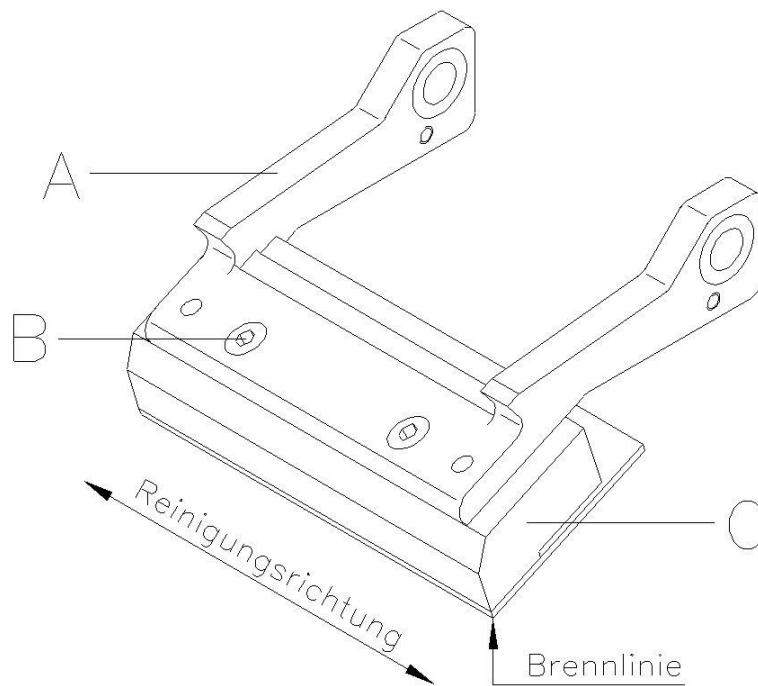5. Remove rear-mounted connection assembly from printhead.

A

B

Reinigungsrichtung

C

Brennlinie

Figure 64

Installing the printhead

1. Insert connection assembly to the new printhead.

2. Position printhead in printhead support (A), so the engaging pieces catch in the appropriate holes in the printhead support (A).

3. Hold printhead holder (A) with a finger slightly on the pressure roll and check the correct position of printhead (C).

4. Screw in screw (B) and tighten it with an Allen key.

5. Insert again ribbon cassette (see chapter 8, page 41).

6. Enter the resistance value of the new printhead in the menu *Service Functions/Heater resistance*. The value is indicated on the type plate of printhead.

7. Start a test print to check printhead position.

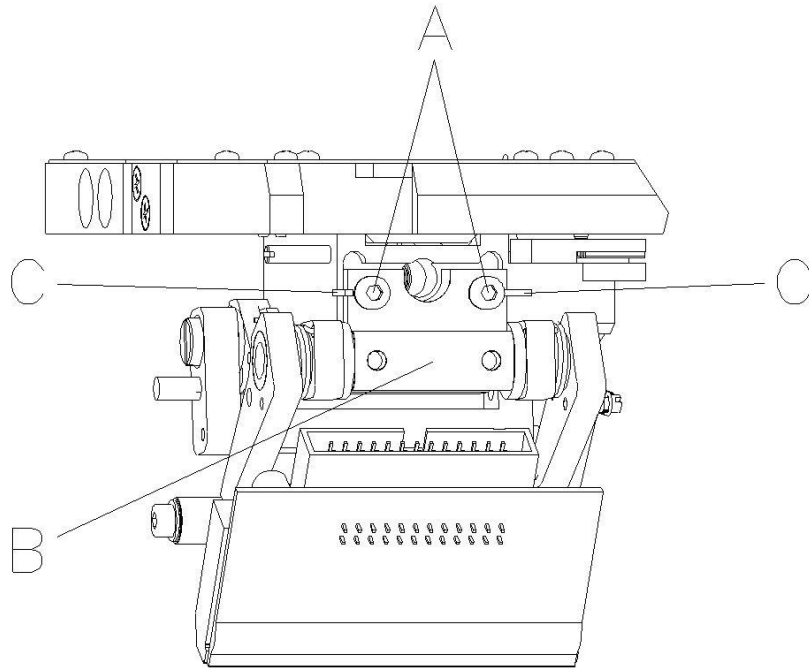## 11.5 Angle Adjustment (Intermittent Mode)

Figure 65

The installation angle of the printhead is default 26° to the print surface. However, manufacturing tolerances of printhead and mechanics can require another angle.

> **⚠ CAUTION!**
>
> Damage of printhead by unequal use!
>
> Higher wastage of ribbon by faster ripping.
>
> ⟹   Change factory settings only in exceptional cases.

1. Loosen slightly two Allen head screws (A).

2. Move adjusting part (B) to adjust the angle between printhead and printhead support.
    move downwards = decrease angle
    move upwards = increase angle

3. Tighten again the Allen head screws (A).

4. Start a print order with approx. 3 layouts to check the correct unwrinkled ribbon run.

> **ℹ NOTICE!**
>
> The slots (C) serve for position control. Pay attention to a parallel adjustment.

11.6 Print Quality Optimisation

The following table shows some possibilities to improve the print quality.
Generally you have to note: the higher the print speed the lower the print quality.

Problem	Mögliche Behebung
Regular inferior print quality	• Increase contrast • Increase pressure • Reduce print speed • Reduce transfer ribbon speed • Reduce distance between printhead and print surface • Change combination of transfer ribbon and print medium • Control print surface (too soft) • Change print angle
Partial inferior print quality (on one side)	• Align surface parallel to printhead • Set regular transfer ribbon tension • Set regular printhead angle
Partial inferior print quality (periodical)	• Sharp surface even • Reinforce surface against bending

11.7 Cycle Optimisation (Intermittent Mode)

NOTICE!

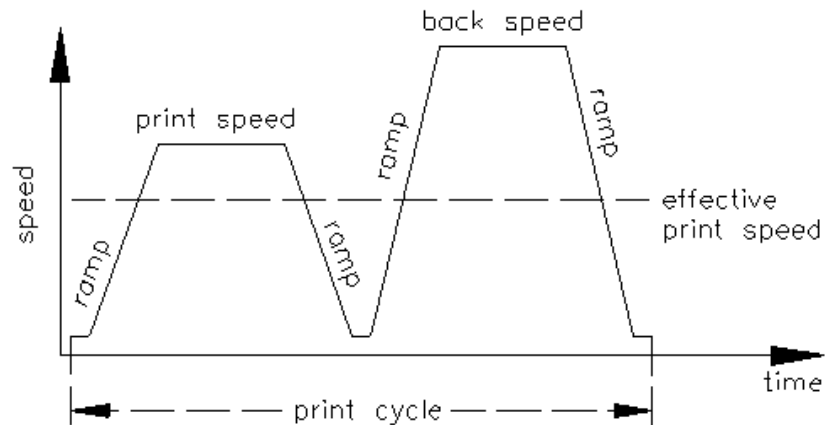The cycle is a finished print cycle per a unit of time.

Figure 66

In case of 'time critical' applications you have the possibility with a good selection of different device parameters to increase the effective print speed and it this way the clock cycle.

- Generally increase the print speed.

- Generally increase the back speed.

- Increase acceleration and brake ramp.

- Change zero point of machine.

- Avoid vertical installation position of print mechanics. Install the machine in horizontal position.

- Control the short distance between printhead and print surface.

- Switch off foil saving automatic.

- Optimise the layout to a short print way, i.e. less blanks, no borders at the top res. bottom, rotate the layout.

12   Signal Diagrams

12.1 Continuous Mode

NOTICE!
The line 'data receipt' indicates when the direct print module receives data.

Dispensing mode: Dynamic

Number of layouts per print order: 1
Data memory: standard
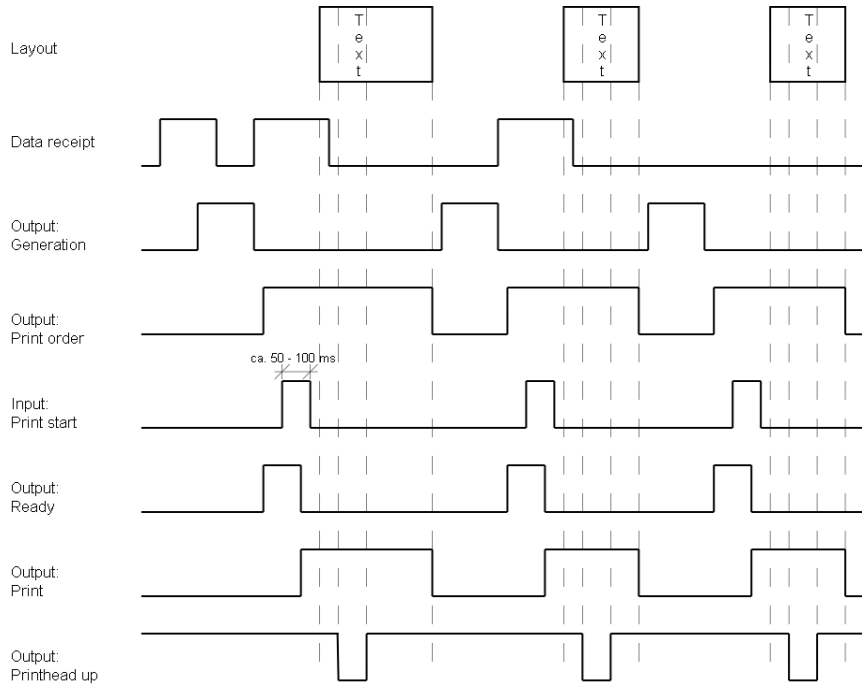Ribbon save: On
Trigger input print start: increasing slope

Figure 67

Layout

In 'dispensing mode: dynamic' the layout distance onto the material is not determined by the layout length but by the time between start impulse and print start input.

Because of the fact that the setting 'data memory: standard' the next print order is generated after the previous one is finished and a print order is only finished after the feed of the complete layout, the smallest possible time between two start impulses depends also from the layout length.

In case the printable data is only at the beginning of the layout and the rest of the layout is empty, then it is possible to decrease the time of start impulse by minimising the layout length (not for 'data memory: extended').

Data receipt

As soon as the generation of a layout is finished, a new one is send to the direct print module. The time of receipt for the first layout is normally shorter because at this time the direct print module has no further action. At receipt of the following layout, the time of receipt is longer because the direct print module receives data and prints at the same time.

Number of layouts per print order: 1
Data memory: extended
Ribbon save: On
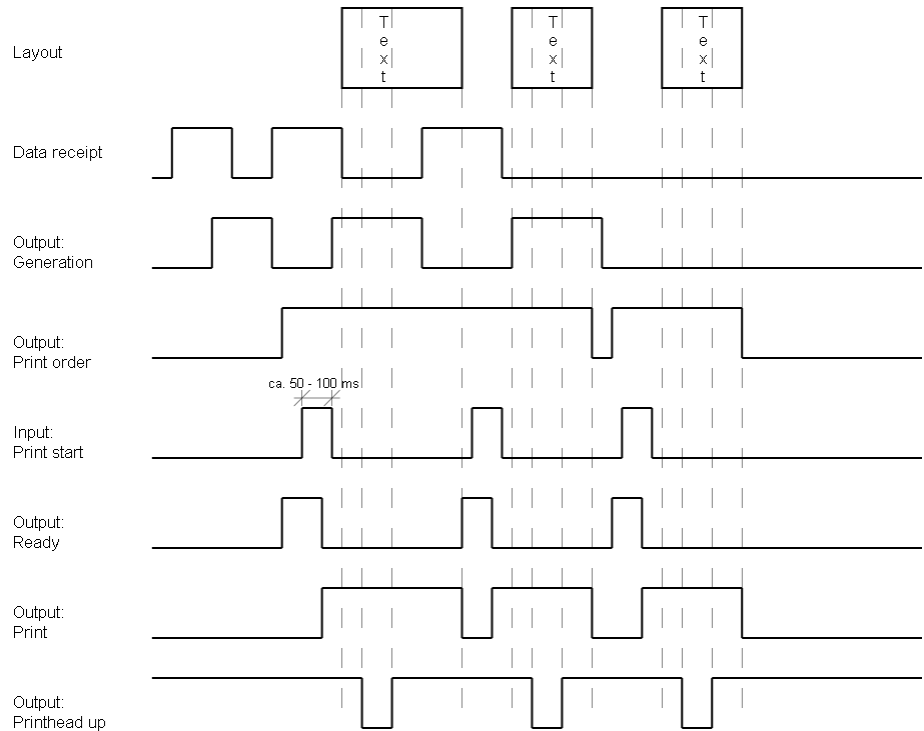Trigger input print start: increasing slope

Figure 68

Layout	For a better comparison we used the same layouts as before.
Data receipt	As soon as the generation of the layout is finished a new one is send to the direct print module.
Data receipt/ generation	The time of receipt for the first layout is normally shorter because at this time the direct print module has no further action. At receipt of the following layout, the time of receipt is longer because the direct print module receives data and prints at the same time.
Generation	In mode 'data memory: extended' already received data is always generated after the start of a print order.
Print order	Before the current print order is finished the next one is already generated. The signal output is therefore active and the next start impulse can be send.
Print	Before the next start impulse is send, the print has to be finished as otherwise the impulse is ignored.

Number of layouts per print order: 3
Data memory: Off/standard/extended
Ribbon save: On
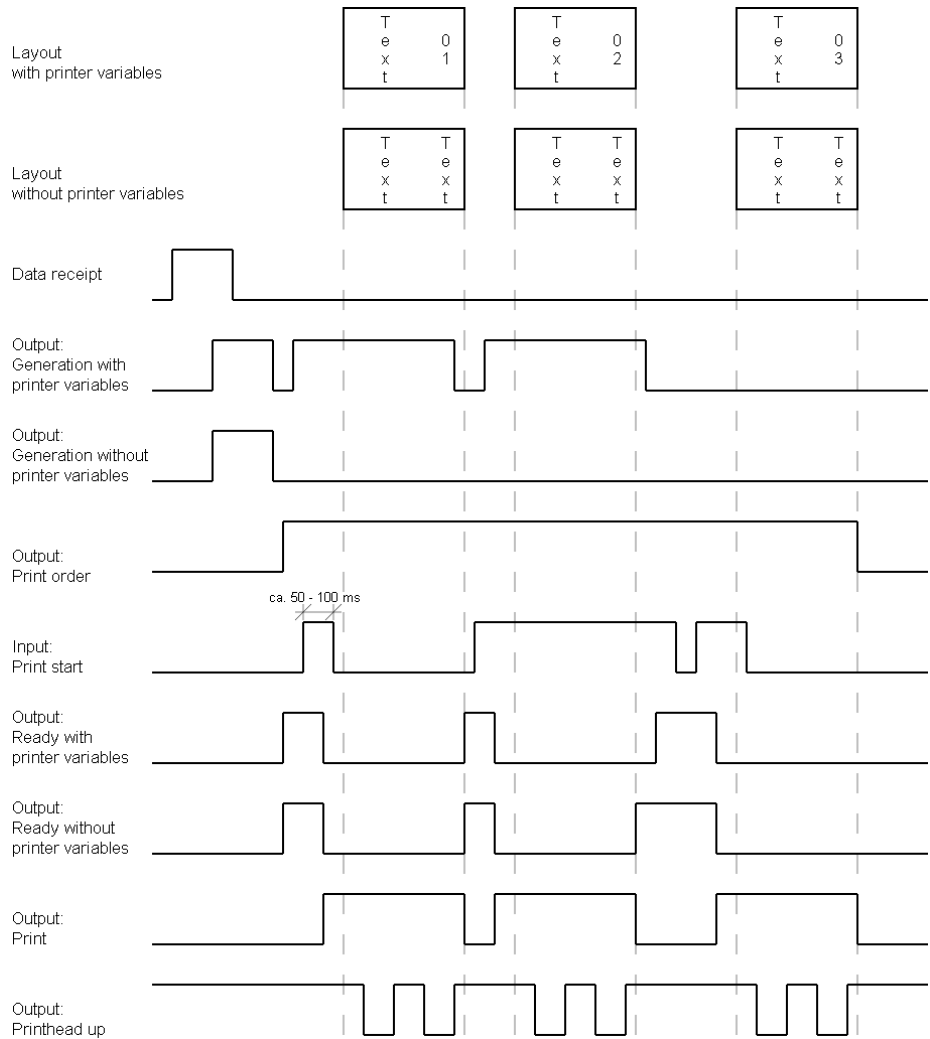Trigger input print start: increasing slope

Figure 69

| **Layout/generation with module variables**	The use of printer variables means that each layout is different and the direct print module has to generate several parts of the layout anew, e.g. variable counter.
Layout/generation without module variables	Each of the 3 layouts which are to print are the same and therefore it is only necessary to generate the layout once.
Data receipt	Because only 1 print order is send, the direct print module has only to receive once.
Print order	As the print order consists of 3 layouts, the print order output is active as long as all 3 layouts are printed.
Print start/print	In dispensing mode dynamic only the slope of the start impulse is recognised as valid print start signal. However, the impulse should have a minimum impulse width of 50 ms.

Dispensing Mode: Number of layouts per print order: 4
Static   Data memory: Off/standard/extended
                       Ribbon save: On
                       Trigger input print start: level High
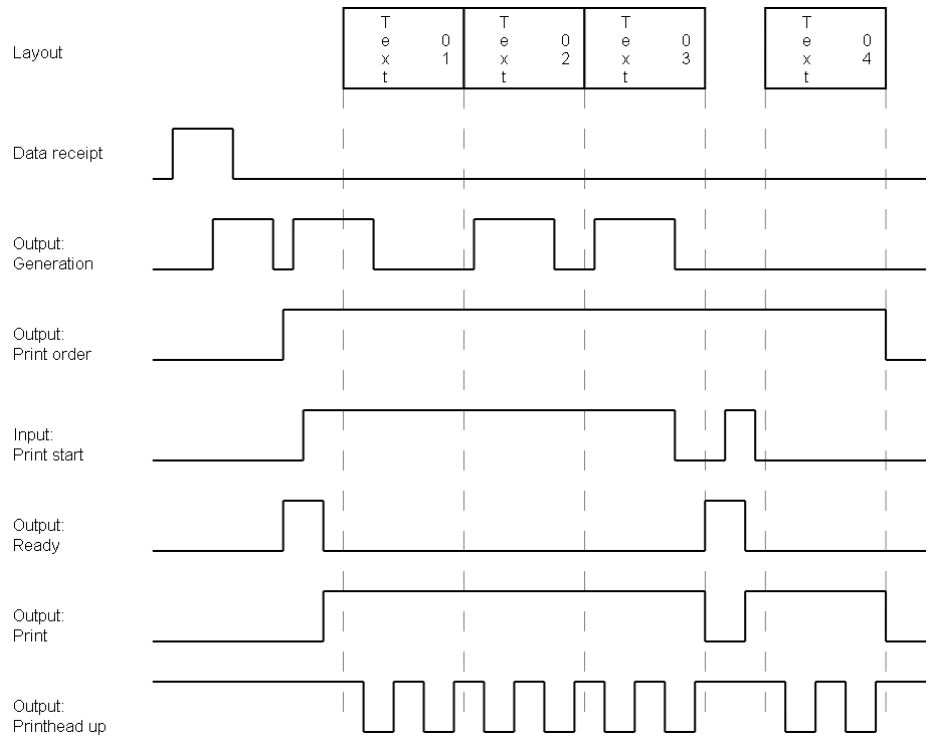
Figure 70

Layout   4 layouts with counter.

Print start/print   In 'dispensing mode: static' the level of the start impulse is recognised as valid start signal. In case the level is activated then the print is continued immediately if the following layout is already generated. After deleting the signal, the machine prints until the end of the current layout and then the direct print module waits for the next start impulse.
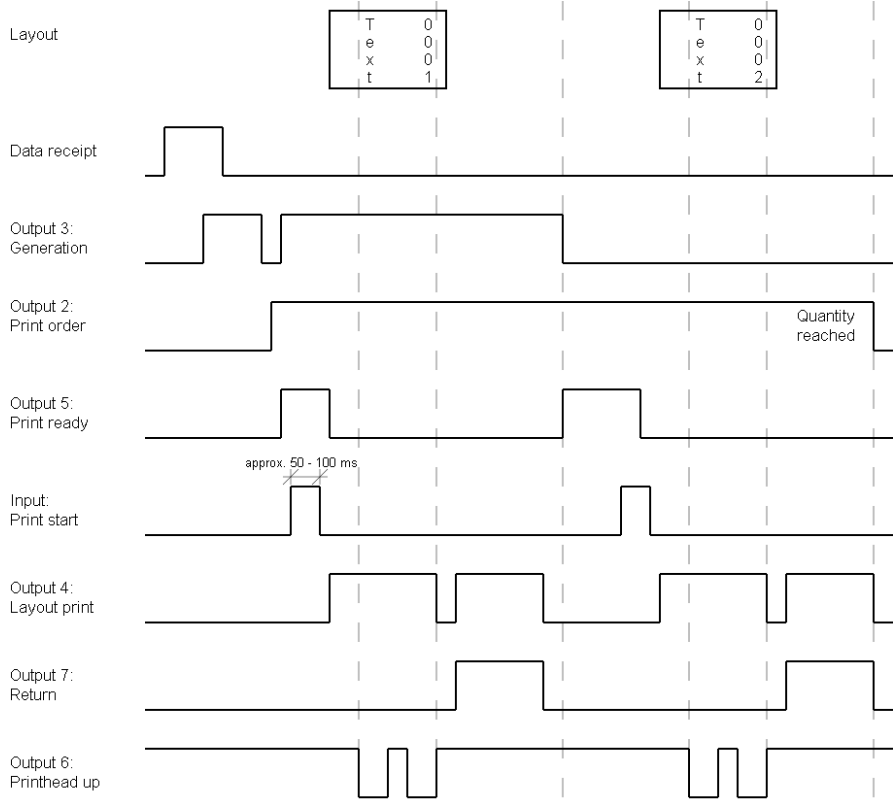
12.2 Intermittent Mode

**Mode 1
(single item
processing)**

Figure 71

**Mode 2
(continuous mode)**
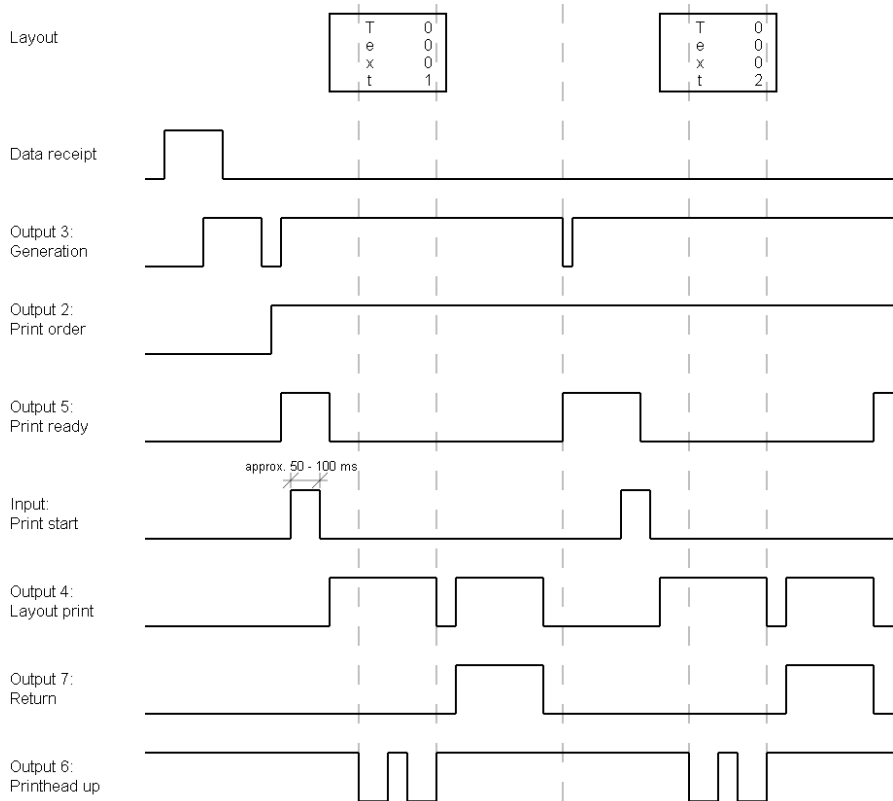
Figure 72

**Mode 4
(continuous mode,
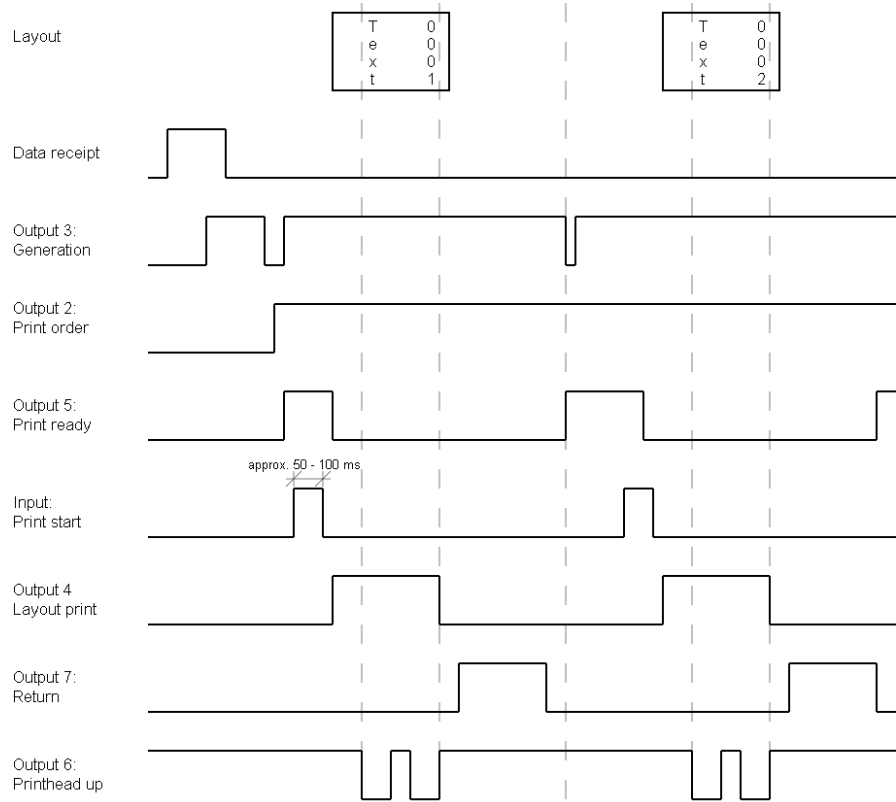return without 'layout
printing' signal)**

Layout

Data receipt

Output 3:
Generation

Output 2:
Print order

Output 5:
Print ready

approx. 50 - 100 ms

Input:
Print start

Output 4
Layout print

Output 7:
Return

Output 6:
Printhead up

Figure 73

13 Error Correction

Error message	Cause	Remedy
1 Line too high	Line rises up completely or partly over the upper edge of label.	Move line down (increase Y value). Check rotation and font.
2 Line too low	Line rises up completely or partly over the bottom edge of label.	Move line up (reduce X value). Check rotation and font.
3 Character set	One res. several characters of the text is res. are not available in the selected font.	Change text. Change font.
4 Unknown code type	Selected code is not available.	Check code type.
5 Unvalid position	Selected position is not available.	Check position.
6 CV font	Selected font is not available.	Check font.
7 Vector font	Selected font is not available.	Check font.
8 Measuring label	While measuring no label was found. Set label length is too large.	Check label length and if labels are inserted correctly. Restart measuring anew.
9 No label found	No label available. Soiled label photocell. Labels not inserted correctly.	Insert new label roll. Check if labels are inserted correctly. Clean the label photocell.
10 No ribbon	During the print order the ribbon roll becomes empty. Defect at the transfer ribbon photocell.	Change transfer ribbon. Check transfer ribbon photocell (service functions).
11 COM FRAMING	Stop bit error.	Check stop bits. Check baud rate. Check cable (printer and PC).
12 COM PARITY	Parity error.	Check parity. Check baud rate. Check cable (printer and PC).
13 COM OVERRUN	Loss of data at serial interface (RS-232).	Check baud rate. Check cable (printer and PC).

Error message	Cause	Remedy
14 Field numer	Received line number is invalid at RS-232 and Centronics.	Check sent data. Check connection PC - printer.
15 Length mask	Invalid length of received mask statement.	Check sent data. Check connection PC - printer.
16 Unknown mask	Transferred mask statement is invalid.	Check sent data. Check connection PC - printer.
17 Missing ETB	No end of data found.	Check sent data. Check connection PC - printer.
18 Invalid character	One res. several characters of the text is res. are not available in the selected font.	Change text. Change font.
19 Invalid statement	Unknown transferred data record.	Check sent data. Check connection PC - printer.
20 Invalid check digit	For check digit control the entered res. received check digit is wrong.	Calculate check digit anew. Check code data.
21 Invalid SC number	Selected SC factor is invalid for EAN res. UPC.	Check SC factor.
22 Invalid number of digits	Entered digits for EAN res. UPC are invalid < 12; > 13.	Check number of digits.
23 Check digit calculation	Selected check digit calculation is not available in the bar code.	Check calculation of check digit. Check bar code type.
24 Invalid extension	Selected zoom factor is not available.	Check zoom factor.
25 Offset sign	Entered sign is not available.	Check offset value.
26 Offset value	Entered offset value is invalid.	Check offset value.
27 Printhead temperature	Printhead temperature is too high. Defective printhead sensing device.	Reduce contrast. Change printhead.
28 Cutter error	With cut an error occurred. Paper jam.	Check label run. Check cutter run.
29 Invalid parameter	Entered data do not correspond to the characters allowed from the application identifier.	Check code data.

Error message	Cause	Remedy
30 Application Identifier	Selected application identifier is not available in GS1-128.	Check code data.
31 HIBC definition	F Missing HIBC system sign. Missing primary code.	Check definition of HIBC code.
32 System clock	Real Time Clock function is selected but the battery is empty. Defective RTC.	Change battery. Change RTC component.
33 No CF interface	Interrupted connection CPU - CF card. Defective CF card interface.	Check connection CPU - CF card interface. Check CF card interface.
34 No print memory	No print CF found.	Check CF assembly on CPU.
35 Cover open	At start of a print order the printhead is open.	Close the printhead and start print order anew.
36 BCD invalid format	BCD error Invalid format for the calculation of Euro variable.	Check entered format.
37 BCD overflow	BCD error Invalid format for the calculation of Euro variable.	Check entered format.
38 BCD division	BCD error Invalid format for the calculation of Euro variable.	Check entered format.
39 FLASH ERROR	Flash component error.	Run a software update. Change CPU.
40 Length command	Invalid length of the received command statement.	Check data sent. Check connection PC - printer.
41 No drive	CF card not found / not correctly inserted.	Insert CF card correctly.
42 Drive error	Impossible to read CF card (faulty).	Check CF card, if necessary change it.
43 Not formatted	CF Card not formatted.	Format CF card.
44 Delete current directory	Attempt to delete the actual directory.	Change directory.
45 Path too long	Too long indication of path.	Indicate a shorter path.

Error message	Cause	Remedy
46 Drive write-protected	Memory card is write-protected.	Deactivate write protection.
47 Directory not file	Attempt to indicate a directory as file name.	Correct your entry.
48 File already open	Attempt to change a file during an access is active.	Select another file.
49 No file/directory	File does not exist on CF card.	Check file name.
50 Invalid file name	File name contains invalid characters.	Correct entry of name, remove special characters.
51 Internal file error	Internal file system error.	Please contact your distributor.
52 Root full	The max. number (64) of main directory entries is reached.	Delete at least one main directory entry and create subdirectories.
53 Drive full	Maximum CF capacity is reached.	Use new CF Card, delete no longer required files.
54 File/directory exists	The selected file/directory already exists.	Check name, select a different name.
55 File too large	During copying procedure not enough memory space onto target drive available.	Use a larger target card.
56 No update file	Errors in update file of firmware.	Start update file anew.
57 Invalid graphic file	The selected file does not contain graphic data.	Check file name.
58 Directory not empty	Attempt to delete a not empty directory.	Delete all files and sub-directories in the desired directory.
59 No interface	No CF card drive found.	Check connection of CF card drive. Contact your distributor
60 No CF card	No CF card is inserted.	Insert CF card in the slot.
61 Webserver error	Error at start of web server.	Please contact your distributor.
62 Wrong FPGA	The direct print module is equipped with the wrong FPGA.	Please contact your distributor.
63 End position	The label length is too long. The number of labels per cycle is too much.	Check label length res. the number of labels per cycle.

Error message	Cause	Remedy
64 Zero point	Defective photocell.	Change photocell.
65 Compressed air	Pressure air is not connected.	Check pressure air.
66 External releaser	External print release signal is missing.	Check input signal.
67 Row too long	Wrong definition of column width res. number of columns.	Reduce the column width res. correct the number of columns.
68 Scanner	The connected bar code scanner signals a device error.	Check the connection scanner/printer. Check scanner (dirty).
69 Scanner NoRead	Bad print quality. Printhead completely soiled or defective. Print speed too high.	Increase contrast. Clean printhead or exchange (if necessary). Reduce print speed.
70 Scanner data	Scanned data does not correspond to the data which is to print.	Exchange printhead.
71 Invalid page	As page number either 0 or a number > 9 is selected.	Select a number between 1 and 9.
72 Page selection	A page which is not available is selected.	Check the defined pages.
73 Page not defined	The page is not defined.	Check the print definition.
74 Format user guiding	Wrong format for customised entry.	Check the format string.
75 Format date/time	Wrong format for date/time.	Check the format string.
76 Hotstart CF	No CF card found.	If option hotstart was activated, a CF card must be inserted. Switch off the printer before inserting the memory card.
77 Flip/Rotate	Selection of print of several columns and also mirror/rotate.	It is only possible to select one of both functions.
78 System file	Loading of temporary hotstart files.	Not possible.
79 Shift variable	Faulty definition of shift times (overlapping times).	Check definition of shift times.
80 GS1 Databar	General GS1 Databar error.	Check definition and parameter of GS1 Databar code.
81 IGP error	Protocol error IGP.	Check sent data.

Error message	Cause	Remedy
82 Time generation	Printing creation was still active at print start.	Reduce print speed. Use printers' output signal for synchronisation. Use bitmap fonts to reduce generating time.
83 Transport protection	Both DPM position sensors (start/end) are active.	Displace zero point sensor Check sensors in service functions menu
84 No font data	Font and web data is missing.	Run a software update.
85 No layout ID	Label ID definition is missing.	Define label ID onto the label.
86 Layout ID	Scanned data does not correspond to defined ID.	Wrong label loaded from CF card.
87 RFID no label	RFID unit cannot recognise a label.	Displace RFID unit or use an offset.
88 RFID verify	Error while checking programmed data.	Faulty RFID label. Check RFID definitions
89 RFID timeout	Error at programming the RFID label.	Label positioning. Faulty label.
90 RFID data	Faulty or incomplete definition of RFID data.	Check RFID data definitions.
91 RFID tag type	Definition of label data does not correspond with the used label.	Check storage partitioning of used label type
92 RFID lock	Error at programming the RFID label (locked fields).	Check RFID data definitions. Label was already programmed.
93 RFID programming	Error at programming the RFID label.	Check RFID definitions.
94 Scanner timeout	The scanner could not read the bar code within the set timeout time.	
	Defective printhead. Wrinkles in transfer ribbon. Scanner wrong positioned. Timeout time too short.	Check printhead. Check transfer ribbon. Position scanner correctly, corresponding to the set feeding. Select longer timeout time.

Error message	Cause	Remedy
95 Scanner layout difference	Scanner data does not correspond to bar code data.	Check adjustment of scanner. Check scanner settings / connection.
96 COM break	Serial interface error.	Check settings for serial data transmission as well as cable (printer-PC).
97 COM general	Serial interface error.	Check settings for serial data transmission as well as cable (printer-PC).
98 No software printhead FPGA	No printhead-FPGA data available.	Please contact your responsible distributor.
99 Load software printhead FPGA	Error when programming printhead-FPGA.	Please contact your responsible distributor.
100 Upper position	Sensor signal up is missing (option APL 100).	Check input signals / compressed-air supply.
101 Lower position	Sensor signal down is missing (option APL 100).	Check input signals / compressed-air supply.
102 Vacuum plate empty	Sensor does not recognise a label at vacuum plate (option APL 100).	Check input signals / compressed-air supply.
103 Start signal	Print order is active but device not ready to process it.	Check start signal.
104 No print data	Print data outside the defined label. Selection of wrong module type (design software).	Check selected module type. Check selection of left/right version.
105 Printhead	No original printhead is used.	Check the used printhead. Contact your distributor.
106 Invalid Tag type	Wrong Tag type. Tad data do not match the Tag type in the printer.	Adapt data or use the correct Tag type.
107 RFID invalid	RFID module is not activated. No RFID data can be processed.	Activate RFID module or remove RFID data from label data.
108 GS1-128 invalid	Transferred GS1-128 bar code is invalid.	Verify bar code data (see GS1-128 bar code specification).
109 EPC parameter	Error at EPC calculation.	Verify data (see EPC specification).

Error message	Cause	Remedy
110 Housing open	When starting the print order the housing cover is not closed.	Close the housing cover and start the print order anew.
111 EAN.UCC code	Transferred EAN.UCC code is invalid.	Verify bar code data (see corresponding specification).
112 Print carriage	Printing carriage does not move.	Check gear belt (possibly broken).
113 Applicator error	Error while using applicator.	Check applicator.
114 Left position	Left final position switch is not in correct position.	Check LEFT final position switch for correct function and position. Check function of pneumatics for cross traverse.
115 Right position	Right final position switch is not in correct position.	Check RIGHT final position switch for correct function and position. Check function of pneumatics for cross traverse.
116 Print position	The print position is not correct.	Check TOP and RIGHT final position switch for correct function and position. Check pneumatics for function
117 XML parameter	The parameters in the XML file are not correct.	Please contact your responsible distributor.
118 Invalid variable	Transferred variable is invalid with customized entry.	Select correct variable without customized entry and transfer it.
119 No ribbon	During the print order the ribbon roll becomes empty. Defect at the transfer ribbon photocell.	Change transfer ribbon. Check transfer ribbon photocell (service functions).
120 Wrong directory	Invalid target directory when copying.	Target directory must not be within the source directory. Check target directory.
121 No label found	No label found at the rear printhead (DuoPrint). Soiled label photocell. Labels not inserted correctly.	Insert new label roll. Clean the label photocell. Check if labels are inserted correctly.
122 IP occupied	The IP address was already assigned.	Assign a new IP address.

Error message	Cause	Remedy
123 Print asynchronous	The label photocell do not work in the order as it is expected according to print data.	Check label size and gap size.
	The settings of the photocell are not correct.	Check label photocell settings.
	Settings of label size and gap size are not correct.	Check correct loading of label material.
	No label found at the rear printhead.	Insert new label roll.
	Soiled label photocell.	Clean the label photocell.
	Labels not inserted correctly.	Check if labels are inserted correctly.
124 Speed too slow.	The print speed is too slow.	Increase the speed of customers' machine.

14   Additional Information

14.1 Hotstart

i **NOTICE!**

Because of the fact that no battery-buffered SRAM is available, the necessary data has to be saved in another way, i.e. the data is saved onto CF card. Therefore the CF card is a condition for the *Hotstart* menu item.

The function *Hotstart* contains e.g. that in case of a power failure the currently loaded layout can be further processed without any loss of data. Moreover a print order can be interrupted and to be continued after switching on the direct print module anew.

i **NOTICE!**

At an active *Hotstart* all necessary data is stored on the CF card therefore do not remove the card during operation. When removing during operation, this causes the loss of all data on the CF card.

Saving the current layout

In case the *Hotstart* function is set to on, at the start of a print order the data of the current layout is saved to the corresponding directory of the CF card.
However the following conditions have to be fulfilled:

- CF card inserted in drive A.

- CF card not write-protected.

- Enough free storage space onto CF card.

An error message appears in case these conditions are not fulfilled.

Saving the print order state

At switching off the direct print module the state of the current print order is saved to the corresponding directory of the CF card.
However the following conditions have to be fulfilled:

- CF card inserted in drive A.

- CF card not write-protected.

- Enough free storage space onto CF card.

Loading a layout and print order state

When restarting the direct print module (if the function *Hotstart* is activated) the saved layout data and the status of print order were loaded from the corresponding file on the CF card. Because of this reason, when switching on the direct print module a CF card has to be inserted in the appropriate drive. If the data cannot be loaded an error message appears.

**Starting the
print order**

In case at switching off the direct print module a print order was active, then a print start is released automatically and the required res. actual number of printed layouts is refreshed. In case the print order was stopped at switching off the direct print module, it is again set to the stopped mode after switching on the direct print module anew. In case a customized entry was active during switching off the direct print module, the window for the first customized variable is displayed.

**Refreshing the
variable counter**

As in the intended file only the start values of the counter are saved, they are refreshed at a new start of the print order by means of the number of printed layouts. Each counter is counted corresponding from its start value. Afterwards the position of the current and the next counter update are correctly set by means of the update intervals.

NOTICE
Make sure that in case graphics are onto the layout they have to be saved onto CF card.

14.2 Password Protection

Example 1:   The supervisor programs a CF Card directly with the direct print module. He stores 10 different layouts. As well he adjusts the print parameters, like contrast, speed, etc. to the corresponding values. The user is only supposed to read the layouts from CF card and to print them. Therefore the supervisor blocks the function menu and the entry function by a password.

Example 2:   The direct print module is connected to a PC. The user is only supposed to take the layouts dispensed by the direct print module and stick them on. To prevent, that the layouts or the direct print module set-up will not be changed, the supervisor blocks all device functions (e.g. function menu, entry menu, etc.) by a password.

Example 3:   The user has to change several texts before printing. It is not allowed to change any masks (fonts, position, etc.). Therefore the supervisor blocks the entry of mask and the function menu. By this means the user indeed can print layouts, but the set-up of direct print module and the masks of the layout cannot be changed.

To receive a most flexible password protection, the device functions will be divided into several function groups:

1. Function menu: In the function menu the print parameters can be changed (contrast, speed, mode, ...). The password protection prevents modifications at the print settings.

2. CF card: With the functions of your CF Card layouts can be stored, loaded, etc. The password protection has to decide if no access or only readable access on CF card is allowed.

3. Print functions: With key **quant** a print can be produced. In case the direct print module is connected to a PC, it can be useful, that the user is not able to produce a print manually. So the password protection prevents that prints can be produced manually.

Because of these different function groups the password protection is very flexible. The direct print module can be adjusted best to its actual order, as only certain functions are blocked.

Definition of password   In case no password is defined res. the password protection is not activated, all functions can be used. Enter the password in menu *Device Settings/Password Protection* and activate the function. Then it iis possible to select which functions are to be blocked.

F:	Function menu	0...open
		1...locked
CF:	CF card	0...open
		1...only reading access
		2...access blocked
D:	Device guiding	0...open
		1...open
		2...no manual print release

If the password protection is active but the function menu not protected, first of all the password (four-digit number, possible values 0000 - 9999) has to be entered. Now the modifications can be made. The user can define the password in the first line (four-digit number).

Activate blocked function: In order to execute a blocked function, first of all the valid password has to be entered. If the correct password is entered then the desired function can be executed. If a wrong password is entered, no error message appears but the device returns to the main menu.

15 Ribbon Save / Foil Saving

15.1 Explication

Ribbon save = maximum utilisation of transfer ribbon

Layout

**Transfer ribbon
without
ribbon save**

```
\--/   \--/
  |      |
  |      Layout ribbon save
  |
Field ribbon save
```
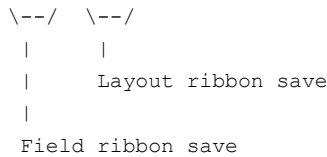
**Transfer ribbon
with
ribbon save**
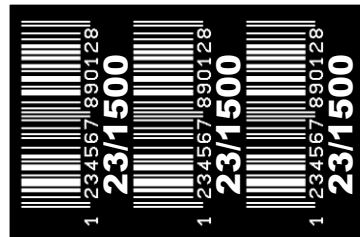
Procedure In principle the ribbon save is achieved by the way that the transfer ribbon in phases in those no printing is effected stopped or decelerated. If sufficient time is available, the transfer ribbon which was not used for printing can be retracted to print on it afterwards. The possibilities of ribbon save and in this way of the print quality are to be connected with the available time which is needed for decelerating and accelerating of transfer ribbon.
There are two different types of ribbon save:

Field ribbon save It is tried to save transfer ribbon with gaps within the layout. Because of the fact that the gaps are usually very small, only little time is available. Therefore a feedback is not reasonable (lack of time).

Layout ribbon save The gaps between the layouts are optimised. Usually more time is available here. The loss of transfer ribbon between the layouts which result from accelerating and decelerating of transfer ribbon can be corrected by means of the return.

15.2 Standard Ribbon Save (Continuous Mode)

Ribbon save mode   Select ribbon save mode *Standard*.

Return correction   **0 mm** = It is always so far retracted that an optimal ribbon save is reached (no loss of transfer ribbon). This is rather rarely realised, as the ribbon position can deviate because of inaccuracies at speed measurement (encoder).
Default: -1 mm

−xx mm = The feedback can be made smaller. It causes loss of transfer ribbon but the number of cycles is increased. If the value is increased to the complete backfeed length then the direct print module sets automatically the max. value and no more backfeed is accomplished.

+xx mm = The feedback can be made larger. This causes that it is printed onto the transfer ribbon in the previous printout.

Example
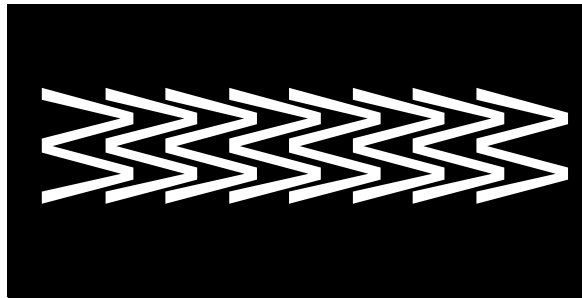
Performance information   **sa/mm:** The smallest possible distance of two prints with full ribbon save (the print offset must be set to the minimum value). As basis for the calculation the set ribbon save parameters are used, as well as mode and especially the indicated max. print speed.

measured distance sa
sa = smallest possible distance between two printouts

cmin: Max. number of cycles per minute.

so/mm: Indicates the loss of ribbon save, i.e. how many mm transfer ribbon is effectively lost.

so = loss of ribbon savings

Expert parameters

This menu item is password protected. Enter and confirm password, then the following parameters are indicated:

Printhead down time

PhDownT = printhead down time in ms:
This is used from ribbon save algorithm for the calculation of start time of printhead upwards movement.

Ribbon motor early start time

REStartT = ribbon motor early start time in ms:
This value is added to the increase time of transfer ribbon movement. Time indication for the time between 'motor reached material speed' and 'printhead burns'.
If the same value is entered as for PhDownT, the printhead upwards movement is not started before the transfer ribbon motor reached the material speed.

Minimal print speed

MinSpeed = minimal print speed:
If the min. print speed is increased, the max. number of cycles is also increased.

Print offset border calculation

Calcoff = Turn On/Off print offset border calculation:
If this parameter is set to Off, then a smaller offset as the required print offset can be entered.

Printhead up time

PHupT = printhead up time in ms:
Is used from ribbon save algorithm to calculate if a field ribbon save can be made or not.

Valve reaction time

PhVReactT = valve reaction time in ms:
It is calculated when the printhead upwards movement is started.

Ribbon mortor stop delay time

RibMotStpDlayT = ribbon motor stop delay time
Decelaration time in ms in which the transfer ribbon motor is still moved with constant speed before stopping.
This can be used to correct black bars at the end of print or to provide a longer cooling for the printhead.

Press key [➝] to arrive the next menu item.

Field ribbon saving

FieldRS = field ribbon saving:
Off: Field ribbon save mode Off.
PHOnly: Only the printhead is moved. The transfer ribbon is not stopped.
Normal: Field ribbon save is executed only if the transfer ribbon motor is completely stopped.
Strong: Field ribbon save is executed, even if the transfer ribbon motor is not stopped.

Rewind speed	**Rwind v = rewind speed in mm/s:** Indication of rewind in mm/s.
Speed 1. Field	If 0 (default value) is set, the parameter has no influence to the ribbon save. Otherwise the ribbon save algorithm does not use the measured speed for the calculation of layout ribbon save but the speed that is indicated here.
Tension	Indication of length, which is transported forward after measuring the transfer ribbon.

15.3 Shift Ribbon Save (Continuous Mode)

Ribbon save mode	Select ribbon save mode *Shift*.
X-Shift / Y Shift	**X-Shift:** Indication of displacement of the printout in X direction. The printout can be displaced by the entry of a positive or negative value in both directions. **Y-Shift:** Indication of displacement of the printout in printing direction. Enter value 0 in order to achieve a print result in which the columns are arranged side by side on the transfer ribbon.
Lanes / R-Shift	**Lanes:** Indication of number of lanes printed side by side. **R-Shift:** Indication of distance when changing to a new lane.

Example   X-Shift: 2 mm; Y-Shift: −3 mm   X-Shift: 2 mm; Y-Shift: −3 mm
                             Lanes: 2; R-Shift: −5   Lanes: 2; R-Shift: +3 mm

Layout

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Transfer ribbon

X-Shift

Y-Shift

Print result

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Print direction
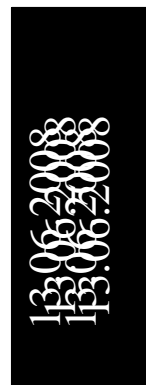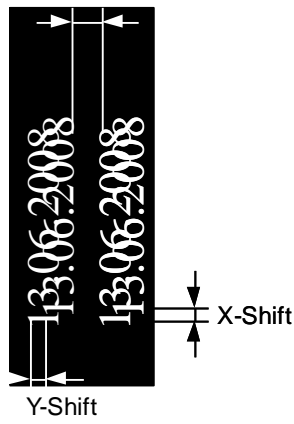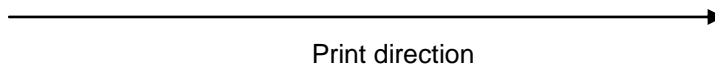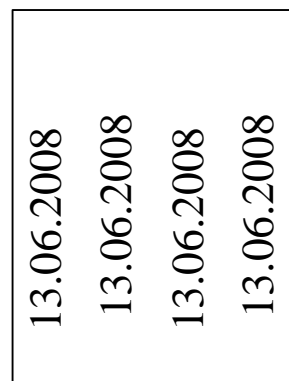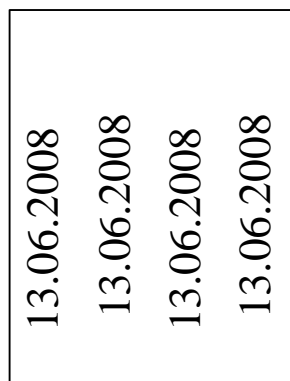
Example
Lanes printing

X-Shift: 0 mm; Y-Shift: −10 mm; Lanes: 2; R-Shift: 0 mm
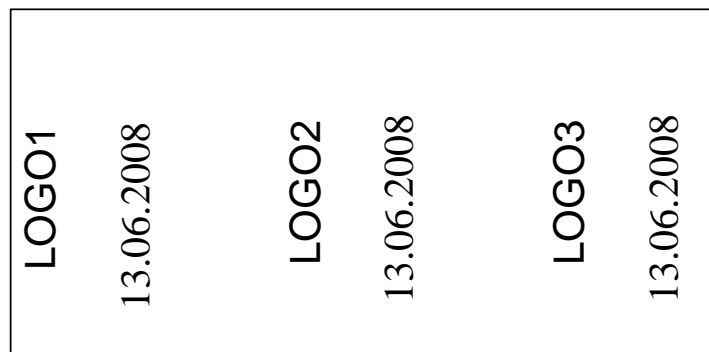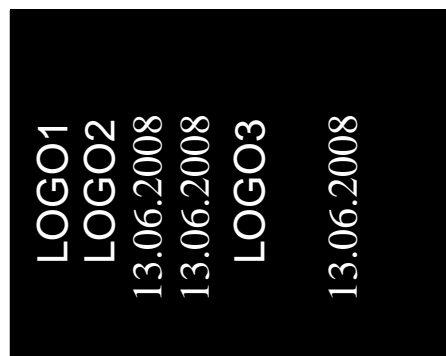
Supposed that the print speed is so high that no field ribbon save is possible, but after a lane enough time is available then by means of the shift ribbon save the gap of the fields can be filled with suitable layouts

ExpertParameters

This menu item is password protected. Enter password and then confirm the entry.

Please find the description of *Expert Parameters* in chapter 15.2, page 110.

15.4 SaveStrt Ribbon Save (Continuous Mode)

Ribbon save mode   Select ribbon save mode *SaveStrt*.

Expert parameters   This menu item is password protected. Enter password and then confirm the entry.

Please find the description of *Expert Parameters* in chapter 15.2, page 110).

15.5 Standard Ribbon Save (Intermittent Mode)

Ribbon save mode   Select ribbon save mode *Standard*.

R correction   Please find the description in chapter 15.2, page 110.

Expert parameters   This menu item is password protected. Enter password and then confirm the entry. The following parameters are indicated:

Printhead down time   **PhDownT = printhead down time in ms:**
Is used from the ribbon save algorithm to calculate the start of the printhead downwards movement.

Printhead up time   **PhUpT = printhead up time in ms:**
Is used from the ribbon save algorithm to calculate if a field ribbon save is possible or not.

Valve reaction time   **PhVReactT = valve reaction time in ms:**
The time is calculated when the printhead upwards movement is started.

Tension mode /   **Tension:** Indication of length that is transported forwards after
Ribbon mode   measuring the transfer ribbon.

Ribbon Mode:
0: The transfer ribbon is retracted after each printout over the complete print length, i.e. no ribbon save between the individual layouts.
1: The transfer ribbon is only retracted over the printed sector, i.e. the gaps between the layouts were not optimised.

When changing the layouts, the transfer ribbon is positioned automatically.

15.6 Shift Optimierung (intermittierender Modus)

Ribbon save mode   Select ribbon save mode *Shift*.

X-Shift / Y-Shift   Please find the description in chapter 15.3, page 112.

Lanes / R-Shift   Please find the description in chapter 15.3, page 112.

Expert parameters   This menu item is password protected. Enter password and then
                           confirm the entry.

                           Please find the description of ExpertParameters in chapter 15.5,
                           page 115.

16   Environmentally-Friendly Disposal
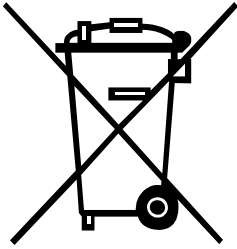
Manufacturers of B2B equipment are obliged to take back and dispose of old equipment that was manufactured after 13 August 2005. As a principle, this old equipment may not be delivered to communal collecting points. It may only be organised, used and disposed of by the manufacturer. Valentin products accordingly labelled can therefore be returned to Carl Valentin GmbH.

This way, you can be sure your old equipment will be disposed of correctly.

Carl Valentin GmbH thereby fulfils all obligations regarding timely disposal of old equipment and facilitates the smooth reselling of these products. Please understand that we can only take back equipment that is sent free of carriage charges.

Further information on the WEEE directive is available on our website www.carl-valentin.de.

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