

# **Technical Handbook**

# **Collamat NG Series**



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Read the Technical Handbook before performing any work on the machine!

#### **Technical Handbook**

#### **Translation of the Original Edition**

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#### General



# 1 General

# 1.1 Information about the Technical Handbook

This Technical Handbook is a technically-detailed addendum to the operating instructions for the Collamat NG. All safety, warning and caution notices in the Collamat NG operating instructions are also valid in this handbook with no restrictions.

The Collamat NG Technical Handbook (abbreviated as TH in this document) is considered the technical element of the operating instructions. The TH should help you to use the Collamat NG to its fullest. The description of the individual mechanical and electrical components also helps for rapid troubleshooting and problem solving in case of faults. Any defective electronics modules (printed circuit boards) are to be replaced as entire units and the defective modules are to be sent to the Collamat AG company or their representatives for repair or exchange. This is the only way to ensure that the high level of quality of your Collamat NG is maintained after repairs.

The special features of the Collamat NG include the following:

- Iow-wear mechanics
- minimal abrasive wear with the rewinder version with friction clutch
- robust, reliable and precise
- simple handling with a modular structure
- easy-to-adjust label brake
- multiple options for installation (clamping pieces) in upright or horizontal position
- user-friendly thanks to modern, menu-based programming
- quickly configured to perform other labeling tasks maximum labeling power
- unwinder unit with a brake mechanism for 300 mm or 400 mm diameter label rolls – optional with double dancer
- highly modern SMD technology
- for 230 VAC / 115 VAC network current (adjustable on the outside of the machine)
- 2-phase stepper motor with micro step resolution for the greatest precision
- various adapters for up to 3 cylinders (standard and customer-specific)optional electrical rewinder (for dispensing speeds > 50 m/min or for wide labels)
  DC motor with 4Q-MC and single- / double dancer control
- optional external connection box / connection module
- optional sensors for monitoring label supply / rewinder volumes, ....
- optional warning lamps (ready error maintenance)
- optional Ethernet connection (standard / customer-specific)
- customer-specific interface



#### 2.1 Software/Firmware

The control program for the Collamat NG has the following features:

- dual processor hardware allows for rapid parallel processing for communication and
- drive control
- modern user interface
- preset and print run counter
- impulse suppression for path-dependent suppression of the label scanning for applications such as printed or transparentlabels
- impulse suppression for path-dependent suppression of the goods scanning after labeling process
- programmable settings for label position
- programmable settings for pre-dispensing
- multiple labeling with electronic adjustment of label offset
- automatic adjustment of dispensing speed with measurement of goods speed using an incremental encoder
- storage of 99 labeling programs
- password protection with multiple access levels
- monitoring of almost empty label supply (LLO optional) and of out of label situation (OOL),
- open counter-pressure roller in traction unit (TUO), rewinder full (RWF - optional),
- motordriver OK, ...
- non-stop operation with 2 Collamat NG systems = interruption-free labeling
- multilingual user interface
- automatic setup of optical label sensor
- all operational steps possible during labeling
- control of all peripheral devices from the program without potentiometers, switches, etc .....
- motorized (optional) rewinder unit for labeling speeds > 40 - 50 m/min
- infinitely adjustable paper brake
- error / warning management every exception status (input) that could influence labeling can be configured from the operator panel as an error, warning, or as a situation to be ignored.



# 2.2 The traction unit

Description

The traction unit system is either attached directly using a clamping piece connection or using a module rail on an adjustable unit.

The corresponding peripheral devices are installed on the module rail and / or on one of the many flanges on the housing. All mechanical parts are surface-treated against corrosion.

The traction cylinder of the system is treated with a special coating for permanent, slip-free drive transmission to the carrier paper.

The braking force of the label strip break is infinitely adjustable.

The traction cylinder can be easily turned by hand when the dispenser is powered down (power OFF) to simplify setup of the dispenser.

The rewinder drive system can be easily turned by hand to simplify setup of the dispenser.

The pressure roller that holds the carrier paper on the traction cylinder can be easily lifted (opened) using a turning knob for easy setup of the dispenser.

When the pressure roller is open, this is displayed on the operator panel (TUO - Error - corresponding warning message).

Uninterruptible labeling can be setup by installing the so called Nonstop-Cabling-Set (two Collamat NG are used – only **one** incremental encoder will be used in speed mode: TACHO).

Several helpful options are available to increase the performance and comfort of a Collamat NG. These are the most important options:

- Electrical rewinder unit (ERW)
- Indicator light column (red-green-orange) (SIG)
- Label volume (empty) observation (LLO)
- Rewinder volume (full) observation (RWF)
- Connection-Box (CBO)
- Connection-Module (CMO)
- Incremental-Encoder (TACHO)
- Magnet Flap Adapter (MFA)
- External Operator Panel (EOP)
- Double Dancer Rewinder
- Double Dancer Unwinder
- Lying Down Set
- Ø400mm Unwinder Disks
- div. clamps, modular rails adjusting units
- div. stands
- etc.



**Collamat NG Series** 

Technology

# 2.3 Components

#### Description

The individual components with their setup options and maintenance are described here. This section begins with a general overview of the dispenser.

The components are mounted on a module rail. Figure x shows these components and their names mounted on the module rail:

#### 2.3.1 Front view



Fig. 2-1

- 1 Pressure roller adapter
- 2 Dispensing edge adapter
- 3 Housing adapter
- 4 Clamping piece, 40 x 40 module rail
- 5 Side connection plate, "SIGNALS"
- 6 Pressure roller for traction cylinder
- 7 Paper brake opener
- 8 Operator Panel (keyboard and LCD)
- 9 Pendulum, feed roller unit
- 10 Unwinder unit
- 11 Unwinder front plate (adjustable)
- 12 Module rail
- 13 Traction cylinder
- 14 Rewinder pendulum
- 15 Rewinder cylinder
- 16 Side connection plate, "power"



#### 2.3.2 Rear view



#### Fig. 2-2

- 1 Pressure roller adapter
- 2 Dispensing edge adapter
- 3 Clamping piece module rail 40/40 x 50
- 4 Side connection plate, "SIGNALS"
- 8 Operator panel (keyboard and LCD)
- 9 Pendulum, feed roller unit
- 10 Unwinder unit

- 11 Unwinder front plate
- 16 Side connection plate, "power"
- 17 Adjustment wheel, dispenser applicator
- 18 Unwinder rear plate (fixed)
- 19 Dispenser edge angle adjustment (+ opt. spring tension)
- 20 Unwinder pendulum spring tension adjustment
- 21 Traction unit housing



#### 2.3.3 Front view traction unit

Traction unit in detail

Drive



- 1 Operator panel (keypad + LCD)
- 2 Paper brake opener
- 3 Paper brake
- 4 Side connection plate, "SIGNALS"
- 5 Pressure roller for traction cylinder
- 6 Module rail flange
- 7 Module rail
- 8 Traction cylinder
- 9 Rewinder pendulum



# 2.4 Assembly examples

#### Description

The modular structure of the Collamat NG gives you nearly limitless assembly options. The following assembly examples have produced good labeling results.



Example 1 - Clamping piece on module rail



Example 2 - Clamping piece on housing floor



Example 3 Horizontal position of Collamat-NG - Clamping piece on housing floor





Example 4 Horizontal position of Collamat-NG - Clamping piece on module rail



Example 5 Horizontal position of Collamat-NG - 2 clamping pieces on module rail



Example 6 - Collamat-NG "overhead" - clamping piece on housing floor or module rail



# 2.4.1 General information's to IP54 version

# IP 54 variation option



Example of a IP54 Installation with side labeling set, IP65 fork sensor (LSC) and fix modular rail clamp piece (FXA)

#### Collamat NG X R S - IP54

The side connection plate "SIGNALS" is available with or without D-SUB connectors/plugs.



#### **INFORMATION!**

Pay attention to the different IP54 directions in the Collamat NG Series Operator Manual.

IP54 units have to be intensely maintained every 12 month (see also chapter Maintenance in the Collamat NG Series operator manual).



# 3 Components

**Electric shock** 



#### DANGER!

Before opening the traction unit (cover at rear), pull the power cord from the device socket. Stored capacitance inside the traction unit can lead to electric shock. Because of this, wait at least 10 seconds prior to opening the system.

# 3.1 Construction

#### Description

The main control unit (HMC0601 Main board) and the traction and rewinder mechanical systems of the Collamat® NG are contained in a stable, attractive metal housing. Setup of software parameters and monitoring of the spender are performed at the operator panel. The Collamat NG housing may only be opened for a "one-time" setup and for service work.

Unscrew the four screws on the rear wall to open the housing from the rear. The goods sensor type is configured using a jumper on the connection board at the "SIGNALS" side connection plate (see Configuring the Collamat NG). The goods sensor connection is set to PNP type by default.

After removing both side connection plates ("Power" and "SIGNALS" connection plates - remove 4 screws from each and unplug cables), the front plate can also be removed (remove the front x assembly screws and pull the front plate out forwards). All components of the Collamat NG are attached to the front plate. Service work is easiest to perform with the front plate removed.

The peripheral components are located outside the traction unit housing:

The **label unwinder unit** is connected to the dispenser housing using a special clamping piece (4 screws).

The **label rewinder unit** is located in the traction unit. The capacity of the Collamat NG rewinder is sized to fit carrier paper from a 400 mm diameter label roll.

For rapid labeling (dispensing speed greater than 50 m/min) or for very wide labels, an optional motorized rewinder is available.

This module consists of a 4-quadrant motor controller, a hightorque DC motor, a sensor module (speed monitoring using compensator control) and a special toroidal transformer with additional winding for the motor controller.

**Description (continued)** 

To simplify feeding the carrier paper into the rewinder core, a special combination module consisting of a friction clutch and one-way bearing was developed. This ensures that the rewinder coil is held at a perfect position despite reverse slippage.

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Order text: Collamat NG S W P B (S=Speed, W=Width, P=Position, B=Branch).

The pendulum of the rewinder damps the carrier paper movement. With the optional motorized rewinder, the rewinder pendulum assumes control of the rewinder speed.

The various **adapter types** (spring adapter, magnet flap adapter (MFA), air vacuum adapter (AVA), etc.) are attached to the 40 x 40 module rail. The module rail itself is connected to the dispenser housing using a special clamping piece. The control and operator signals are connected to the adapter electronics in the adapter housing using ribbon cable fed through the module rail. The adapter electronics (depending on the adapter type, various adapter boards are available) condition the label sensor and the FEED button as well as, depending on the adapter type, the sensor and actor signals.

The **operator panel** consists of a keypad, indicator LEDs and an LCD display and is mounted to the upper guide roller of the feed roller (turnable) by default.

Six keys, three LEDs and a 4-row x 20 character display (with background lighting) allow for simple programming and monitoring of the dispenser.

The operator panel can also be connected to the "SIGNALS" connection plate. For this, the connection cable that normally leads from the main control board to the operator panel is attached to the free 5-pole plug of the connection board at the "SIGNALS" connection plate.

For connecting the operator panel to the "SIGNALS" connection plate (ext. operator), an additional connection cable is needed (HMC06CA31A).

For installing the complete dispenser unit onto an adjustable unit or an assembly unit, various clamping piece types are available (module rail, housing floor, side bottom and side top). See assembly examples at 3.1.





# 3.2 Electronics - Control unit

ESD

Master controller

DANGER!

The electronics of the control unit may not be touched without taking precautions against ESD. The electronics are sensitive to direct electrostatic discharge.

The heart of the **main control unit** is a dual-processor system consisting of a master controller and a slave controller.

The complete master controller unit is contained in a module that is inserted into the main control unit (MHC0601-Mainboard). The master controller communicates with the operator panel, the slave controller and the peripheral components (SIGNALS connection plate and adapter). The modern, powerful master controller leaves nothing to be desired. Even with updated user and dispenser firmware, the controller's computing power will remain sufficient for the coming years. All components including Flash storage, RAM (battery-buffered), interface controllers, real-time clock, RJ45 slot, battery, etc. are located on this card module.



**RCM 4010** 

Slave controller

The **slave controller** executes the rapid dispenser functions assigned by the master controller. The incremental encoder (speed sensor), goods sensor, label sensor and motor controller communicate directly with the slave controller.

The slave controller, power supply, interface controller and signal conditioner are located on the main control unit. This is attached to the front plate with four screws.

Motor controller

Power

Slots



The **motor controller** is a component developed and built by a renowned step motor controller producer. Standard parameters for using the Collamat NG are 80V DC / 5.1/6A – 2000 steps / revolution – automatic current reduction. The **power** for the electronics is delivered by a high-powered toroidal transformer. The rectification and regulation of the various voltages (DC voltage production) is executed at the main control unit and, optionally, at the rewinder module.

> An **additional slot** on the main control unit is for customerspecific applications. Currently, the following add-on boards (piggyback boards) are available:

- X-WEB piggyback board: Controls a transverse belt system
- AVA piggyback board: Controls the various air vacuum adapters
- More add-on boards are planned.



Master controller - Main control unit





Piggyback-Board



Measurements of the master controller and piggyback board

#### **Print Modifications**

HMC0601V3-4-2 - 08.08.2011:

- R63, R64 = 560E
- C29 = 22uF/35V
- R14-19, R23-25, R29 = 560E
- J9, J10 = MSTBVA 2,5/ 2-G-5,08 (1755736)
- Heathsink new drillings: Drawing 152188572
- New partlist: Main-PCB HMC0601 V3-4-2 – 080'82011.pdf
- New schematics: HMC0601-V-3-4 Schema.pdf



# 3.2.1 Details for the main control unit

# Connection terminals and plugs

No.	Description	Cable
J10	58V toroidal transformer, motor voltage, screw terminals	2 red wires
J9	27V toroidal transformer, logic voltage, screw terminals	2 blue wires
J13	Step motor, motor controller, power plug	Cable with 2 cores
J12	Step motor, motor controller, control signal plug	Cable with 8 cores
J7	Control signal plug, SIGNALS connection plate	Cable with 40 cores
J4	OOL – plug – Out Of Label sensor	Cable with 1 cores
J1	TUO – plug - traction unit open sensor	Cable with 3 cores
J3	RWF – plug - ReWinder Full sensor	Cable with 3 cores
J2	LLO – plug - paper supply low sensor	Cable with 3 cores
J11	REW - plug - optional rewinder, control signals	Cable with 6 cores
J6	Operator panel - plug - operator panel	Cable with 5 cores
J8	Adapter plug - ribbon cable to adapter	Cable with 10 cores
J5	Master controller - socket (microcontroller card)	Cable with 40 cores
J14	Add-on board - plug - customer-specific boards	Cable with xx cores
Х3	PE Protective earth	green - yellow
X4	PE Protective earth	green - yellow

#### Fuses

No.	Description	Value
SI1	Microfuse 20 x 5 mm - (logic voltage - 24V DC, 5V DC and 3.3V DC)	2.5AT
SI2	Microfuse 20x5 mm - (step motor voltage - 80V DC)	5.0AT
F1	Electronic fuse (+24V F1 - ICH = 0.75A / IT = 1.5A) F1 monitors the +24V that run on plugs J6, J7 and J8.	0.75 / 1.5A
F2	Electronic fuse (+24V F2 - ICH = $0.20A / IT = 0.4A$ ) F2 - This fuse is only used for the internal board test.	0.2 / 0.4A



Fuses

If the electronic fuses F1 or F2 have triggered, this indicates that an overload or short-circuit is present on one of the loads connected to plugs J6, J7, J8 and ... .

After the short-circuit or overload has been corrected, the corresponding fuse is reactivated after briefly turning it on and off.

The connections at the optional connection box (MHC0604-1-x or HMC0605-2-x) are also protected with the 1AT microfuse.

Another microfuse (3.15AT) is located at the optional magnet flap adapter (MFA), which protects the AC circuit at the corresponding MFA interface (magnet or CP21 connection).

The microfuses SI1 and SI2 are located at the left side of the main control printed board (near the

cooling element). The fuse SI1 is located at the top edge of the board.



SI1

Fuses FI1 and FI2

Voltage control LEDs

On the step motor end stage (NCD06): Green LED: indicates 80V DC voltage. Position: middle LED

On the main control unit (HMC0601): LED D18: indicates 24V DC voltage. Position: by the motor controller plugs J12 + J13 LED D2: indicates 5V DC voltage. Position: left next to battery BT1 LED D1: indicates 3.3V DC voltage. Position: left next to LED D2

If the 80V DC motor voltage or the 24V DC, 5V DC or 3.3V DC voltages are not active, the corresponding LED will **not** be lit. If the 5V DC voltage is not active, the 3.3V DC will not be active either. If one of the voltages is not active, the corresponding fuses must be checked. The fuses are located near the cooling element on the left side of the main control unit. If the fuse is defective, the cause of the defect must be determined. The defect must be corrected before the fuse is replaced.



#### PE - connections (blade terminals)

The PE – connections (earthing terminals) are located at the bottom right and left of the main control unit are labeled X3 and X4.

PE (left): X4 PE (right): X3

*Earthing terminals* (PE terminals) create a connection to the housing frame, the "Power" side plate and to the adapter. They are for connecting an earthing system.

Definition of earthing conductor: Earthing conductors must be colored green/yellow. This color combination may only be used for conductors with a protective earthing function. To avoid mix-ups, no green or yellow wires may be used in supply voltage installations (switch cabinets, cables). At plug connections, the earthing conductors are connected to special protective contacts, which are set up so that they connect prior to the other contacts and separate after the other contacts are separated. Connector cables must be set up so that the earthing conductor is the last to disconnect if the cable is pulled out.

PE connections at the dispenser housing:

PE connections (M4) are located above the opening for the RJ45 socket (Ethernet connection) - one each on the left and right. The PE connection near the "Power" connection plate is the central connection for the entire system (see also PE1 in the assembly diagram in the Appendix).

#### PE - connections are:

No.	Description
1	"Power" connection plate - PE supply input socket to PE supply output socket
2	"Power" connection plate - PE supply input socket to PE control board MHC0601
3	"Power" connection plate - PE supply output socket to PE dispenser housing (PE1)
4	PE dispenser housing (PE1) to PE adapter housing
5	PE dispenser housing (PE2) to PE connector board ("SIGNALS" connection plate)
6	PE adapter housing to PE adapter board (HMC0605 or HMC0606)
7	PE adapter housing to inside side holder of the dispenser edge



#### PE cable

No.	Description	Cable
HMC06CA14	PE power cable	Connections 1, 2 + 3
HMC06CA15	PE cable, adapter housing to traction unit	Connection 4
HMC06CA28	PE connector board cable	Connection 5
HMC06CA27	PE cable, adapter housing to board	Connection 6
HMC06CA26	PE cable, adapter housing to board	Connection 7

See also block diagram in Appendix (Register G)

#### Shielding

The label sensor is very sensitive to disturbances from external influences. Because of this, the transmitter and receiver cables are shielded. These shieldings are at the PE level in the adapter housing. **Service note:** Shielding connections must be kept as short as possible!

# 3.2.2 Changing the main control unit

Changing the main control unit	To replace the main control unit, all cables must be unplugged and the screw terminals for the transformer cables must be loosened. The four mounting screws are then removed and the board is removed. The master controller card module can then be removed. Loosen the mounting screws and unplug the module. If a customer-specific card module is used, this module can now also be unplugged (J14).			
	The new boa mounting scr connected. R them with scr	The new board is carefully inserted and fixed with the four mounting screws. After this, all cables and wires are re- connected. Re-insert the (tested or new) card modules and fix them with screws.		
	Check the fir in the middle (see also Pro	mware version of the master controller (card module of the main control unit - J5) and the slave controller ogramming the controller).		
Version number		INFORMATION!		
		The main control unit and add-on modules (electronics) contain ESD-sensitive components. When handling these electronics, measures against ESD must be taken.		
Warranty		INFORMATION!		
		All defective electronic modules must be replaced. If repairs are attempted or if attempted repairs lead to further malfunctions, the warranty will be void.		



#### 3.2.3 FIRMWARE versions

Version number

Version number



#### **INFORMATION!**

The firmware versions of the master controller, slave controller, optional rewinder controller and operator panel controller must be compatible. The current firmware version numbers are listed on the back wall of the interior of the Collamat NG.

#### **Firmware versions**

Master	1.00
Slave:	1.41
Operator:	3.004
Rewinder:	3.20
Date:	2011-07-19

#### **Firmware Update**

Every microcontroller contains its "task-specific" software - the firmware - in so-called Flash memory.

If the firmware is updated (expansion of task-specific functions = firmware update), the microcontroller that was changed must be reprogrammed in the Collamat NG spender.

The manufacturer of the Collamat NG or its local representatives have special programming devices for this purpose.

Normally, the end user does not have these programming devices available, so Collamat AG offers a special update service by chip or board.

The following firmware update services are available:

- Master controller: Replacement board RCM4010 No. 52180402
- Slave controller: Replacement board HMC0601 No. 52180266
- Operator panel: Replacement microcontroller PIC16F84A No. 52180379
- Rewinder: Replacement microcontroller dsPIC 30F2010 No. 52180408

Please find more information to Firmware update procedures in chapter 6.4.19. and 6.4.20.



# 3.3 Operator panel

#### **Operator Panel**

The operator panel is mounted at the upper guide roller of the unwinder.

The position of the operator panel can be turned to the optimum operator position, depending on the position of the dispenser. The operator panel electronics can be removed from the housing by unscrewing the mounting screws at the rear.



The operator panel

Unscrew the two mounting screws at the back of the operator panel housing. Carefully remove the complete operator panel unit from the housing. Unplug the five-pole connection cable from the board interface. Carefully slide out the four assembly supports (they may stick slightly to the keyboard foil). Unplug the keyboard connection from the interface board. For this, the locking mechanism for the plug must be disengaged (pull the brown plastic piece to the board edge). Remove the interface board from the LCD module (from the 16-pin post plug). If the LCD module is defective: Carefully remove the LCD module from the keyboard foil (this may require a large screwdriver).

Installation of the new parts is performed in the reverse sequence.

Warning: Remove the protective foil from the glass surface of the LCD module!



Interface board

Replacing a defective LCD or interface board



**Replacing the LCD** 



#### DANGER!

When replacing the LCD module, note the warranty limitations. There is no warranty for broken LCDs. Unauthorized manipulation of the components will annul the warranty.



LCD display - rear and front



LCD terminal interface board HMC0609-x - Contrast settings with R1

#### Version number



#### **INFORMATION!**

On the IC1 microcontroller (small label) of the LCD interface board, the firmware version number is listed.

**Contrast settings** 

The small trimmer **R1** on the interface board (HMC0609 board – component side) can be used to set the LCD contrast. The trimmer must be set using a special screwdriver for SMD trimmers. Using another screwdriver can damage the trimmer. No force may be used!



# 3.4 The NDC06 motor controller (MC)

Note	The motor end stage is a component developed and built by a renowned step motor controller producer. The end stage is also known as the motor controller (MC).		
MC NDC06		INFORMATION! The motor end stage is set up, tested and installed into the Collamat <sup>®</sup> by Collamat AG. The motor end stage settings may not be altered. The set phase current may not be adjusted! WARNING: Do not set the switches/jumpers under active voltage!	
MC NDC06		DANGER! No voltage may be active during any work on the motor end stage!	
3.4.1 Changing the MC			
Replacing the MC	To replace the "step motor" motor end stage, start by unplugging		

To replace the "step motor" motor end stage, start by unplugging the three cables (plug sockets AM1, AM2 and AM3). After that, both assembly screws for the end stage on the cooling element can be removed. The complete motor end stage (with cooling element) can now be removed from the front plate. The end stage can now be unscrewed from the cooling element (three screws).

The new motor end stage is now screwed onto the cooling element. Clean the contact surfaces between the cooling element and the end stage profile and use heat-conductive past at the contact point. Now check the switch and jumper settings on the board.



Motor end stage NDC06

# **Collamat**®

Damping: off

# 3.4.2 Settings for the MC

DIP - switches	and	jumpers
----------------	-----	---------

Dip switch DP1; 3, 6 and 7 – ON	1, 2, 4, 5 and 8 - OFF
(Standard Motor: SM2862-5155)	Rated current: 5.1 A:
Dip switch DP1; 6 and 7 – ON	1, 2, 3, 4, 5 and 8 - OFF
(Optional Motor: SM2862-5255)	Rated current: 6.0 A:

#### Note:

Steps/rotation: 2000

The OFF position of the DIP switch is at the edge of the board.

Jumper J1:	(FC) automatic current reduction active (jumper not plugged in)	- OFF
Jumper J2:	(CO) control input, "power off" not active (jumper plugged in)	- ON
Jumper J3:	(OS) step and direction mode active (jumper not plugged in)	- OFF

The complete motor end stage can now be screwed back onto the front plate (clean the contact surfaces here as well and coat them with head-conductive paste).

The corresponding cables can now be plugged back in (AM1, AM2 and AM3).



**DIP** switch settings



Jumper settings J1, J2, J3



# 3.4.3 Status LED for the MC

# MC status LED

LED	Status	Explanation
Green HV	ON	Operating voltage in acceptable range
Red FAU	ON OFF	a – over temperature, if TER LED is <on> b – overvoltage or under voltage, if HV LED is <off> c – short-circuit / motor incorrectly connected if HV LED is <on> Motor end stage OK - if HV LED is <off></off></on></off></on>
Yellow TER	ON OFF	Motor end stage not OK – over temperature Motor end stage not OK – if HV LED is <on></on>



MC status LED

# 3.4.4 Jumpers, LED, DIP and plugs of the MC



# 3.5 FEED

Signal status

The **IFEED** signal is always active while the step motor is turning. This signal can communicate to an external printer unit that paper is moving or not. The printer system analyzes the curves of this signal for printing to determine that the paper is not moving. The time sequence of the IFEED signal is shown in Figure 3-15.

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The **IFEED** signal is separated from the rest of the electronics with an optical coupler. The signal can be used to start an external printer in a potential-free manner.

Using the optical coupler, the signal can be switched for NPN or PNP inputs. The polarity of IFEED can be programmed using the operator panel. NORMAL means that the signal is active when the dispenser is dispensing. INVERS means that the signal is active when the dispenser is not dispensing.

The IFEED signal (as with many other control signals) is available at the connection port ("SIGNALS" side connection plate or on the connection box / module).



Time sequence of the IFEED and FLAP signals

- a. Speed-dependent positioning delay
- b. Length of pre-dispensing
- c. Delay of MFA flap signal

(MFA = magnet flap adapter)

FLAP

The **FLAP** signal course shows the control of a magnet flap adapter (MFA) - the curve clearly shows the delay time (3) that ensures that the adapter touches the product after dispensing a label and is not retracted until after the product has passed.



# 3.6 Controlling external devices

Controlling a hot stamp with IFEED

Hot stamps are connected to the IFEED signal as follows:

The IFEED signal is available at the "SIGNALS" connection plate at plug X4 of the connection box - or, optionally, at the connection box / on the connection module.

Depending on the manufacturer and type of hot stamp, the polarity of the hot stamp trigger signal may need to be changed. This is done in the **IFEED POLARITY** configuration menu to **normal** or **inverted**. See also Figure xx.



Time sequence of the IFEED- and STAMP- signals

- 1 Speed-dependent position delay
- 2 Length of pre-dispensing



Connection diagram - NPN or PNP hot stamp optical coupler inputs

#### NPN / PNP inputs

Optical coupler inputs with included anode and cathode connections can be connected individually. Pre-resistance in the anode cable is already installed. The following inputs of the Collamat NG follow this input principle:

**Collamat**<sup>®</sup>

- GSC\_P
- / GSC\_N
- COUNTER\_INP / COUNTER\_INN
- NSTP\_INP / NSTP\_INN
- RWE\_ERROR\_INP / RWE\_ERROR\_INN
- PRODUCT\_INP / PRODUCT\_INN
- TACA\_P
- TACB\_P

```
for this:
```

XXXXXX\_XXP = anode connection

XXXXXX\_XXN = cathode connection



Connection diagram for NPN or PNP sensors at the optical coupler input Sensor supply voltage from internal



Connection diagram for NPN or PNP sensors at the optical coupler input Sensor supply voltage from external



#### Connecting internal sensors (NPN)

Collamat NG "internal" sensors are NPN sensors, meaning that the optical coupler inputs are set for 24V at the anode side. A 2K2 resistor in the cathode cable ensures proper current limiting. These inputs can be switched very easily by establish a shortcircuit against GND. The following inputs of the Collamat NG follow this input principle:

- RTA\_ERR
- TUNIT
- LLO
- RWF
- OOL



**Connecting external sensors (PNP)** 

Collamat NG **"external"** sensors are PNP sensors, meaning that the optical coupler inputs are set to GND at the cathode side. A 3K3 resistor in the anode cable ensures proper current limiting. When positive voltage (24V) is activated at the inputs, these inputs can be switched very easily. The following inputs of the Collamat NG follow this input principle:

- DISP
- START
- STOP
- READY
- LOCK\_INV
- LOCK





# 3.7 Incremental encoder (optional)

#### 3.7.1 Speed measurement

Variable speed

For the labels to be placed onto the goods at exactly the speed of the goods, the goods speed must be measured. This is performed using an incremental encoder, which transmits pulses to the slave controller in accordance with the measured path distance (inputs TACA\_P and TACB\_P at the M12 TACHO socket).

Electrical connection of the incremental encoder: see **Incremental encoder (TACHO)** under "SIGNALS" side connection plate and the next page.

When using an incremental encoder for speed measurement, the step distance must be entered at the operator panel for correct measurement. The step distance is the distance traveled by the goods between two encoder pulses (waves).

The step distance is calculated as follows:



#### Example 1:

The Collamat NG (black wheel) incremental encoder **1** sends 2000 pulses per rotation. The incremental encoder wheel is driven by conveyor belt **2**. The wheel diameter **d** measures 70 mm. Both rising and falling waves at outputs A and B are counted.

d * pi	219.91 mm
Step =	= = 0.027489 mm / pulse
Pulse	4 * 2000 pulses

#### Example 2:

The Collamat NG (blue wheel) incremental encoder 1 sends one pulse per 0.1 mm. The incremental encoder wheel is driven by conveyor belt 2. Both rising and falling waves at outputs A and B are counted.

0.1mm:	
Step = =	0.025 mm / pulse
Pulse * 4	-



# 3.7.2 Hardware data for the incremental encoder

#### **Black Wheel incremental encoder**

What	Data
Operating voltage + Vs	1030V DC – typical: 24V DC
Current input	60Ma
Resolution	2000 pulses / rotation
Impulse tolerance	+/- 15%
Moment of inertia	typically 3 X 10 <sup>-7</sup> kgm <sup>2</sup>
Operating torque	typically 0.21cNm (3000 U/min 20°C)
Protection type	IP64
Outputs A, B and N	Push-pull, short-circuit-proof
Mech. connection	Hollow shaft, 6 mm diameter
Cable length	4m
Friction wheel:	70.0 mm diameter
Cable colors + pins	+VsbrownM12 - pin 1Channel AgreenM12 - pin 4Channel ByellowM12 - pin 2GNDwhiteM12 - pin 3Channel Npinkn.u. *Shieldingconnected to housingn.u. *Index signal is not used
M12 plug:	MURR Elektronik – Part.Nbr. 7000-12491-0000000
Caution:	The turning direction of the incremental encoder will be automatically detected by the Collamat NG. See mounting direction (arrow) of the encoder on the picture below. The encoder should be pulled (and not pushed) by the conveyor belt.



Black Wheel incremental encoder



#### Blue Wheel incremental encoder

What	Data	
Operating voltage + Vs	826V DC – typical: 24V DC	
Current input	<=60mA	
Resolution	0.1mm / pulse	
Rise / fall time	< 2us	
Max. speed	480m/min (8m/s)	
Shock	20g/11ms	
Protection type	IP50	
Outputs A, B and N	Push-Pull	
Friction wheel	PU silicon rubber – 63.66mm	
Cable length	4m (diam. 4.5mm)	
Cable colors + pins	+VsredM12 - pin 1Channel AwhiteM12 - pin 2Channel BgreenM12 - pin 4GNDblackM12 - pin 3Shieldingconnected to housingNoIndex channel not available	
M12 plug:	MURR Elektronik – Part.Nbr. 7000-12491-0000000	
Caution:	The turning direction of the incremental encoder will be automatically detected by the Collamat NG. See mounting direction (arrow) of the encoder on the picture below. The encoder should be pulled (and not pushed) by the conveyor belt.	



Blue Wheel incremental encoder


# 3.8 Labeling theory

Standard Mode

#### First check before starting:

Before starting a dispensing sequence (dispensing a label), a few important parameters have to be checked first by the Collamat NG firmware:

- Position: Check of the Position value / Position delay (see drawing). ). A too short Position value connotes: the stepper motor is not able to speed up (ramp up) to reach the actual product speed (good speed) within the defined position distance/ -time! A too low Position value can also result in an error- or warningmessage on the display (depending on the setting of the "Configuration – Error handling - Position to short" parameter.
- Predispensing: Check of the Predispensing value (see drawing). The distance from the physical position of the label sensor to the desired stop position of the label on the dispensing edge is called "Predispensing" ("Labeling parameter Predispensing"). A too short value connotes: the stepper motor is not able to speed down (ramp down to the desired stop position) within the defined predispensing distance! A too low Predispensing value can also result in an error- or warning-message on the display (depending on the setting of the "Configuration Error handling Predispensing to short" parameter).

#### Starting a single labeling sequence:

**1-Start:** The start point for a single labeling sequence (dispensing one label on the product) is always the triggering of the good scanner (GSC) by the front edge of the product (in product flow direction).

**2-Position-Delay:** First action is the start of the position delay ["Labeling Parameter - Position" minus calculated speed compensation].

#### Position delay = POSITION minus SPEED COMPENSATION

**3-Motor start:** After the expiration of the position delay, the stepper motor starts moving – beginning with the start speed ("Service - Stepper motor - Start-speed") - speeding up with the defined acceleration ("Service - Stepper-Motor - Acceleration" = UP RAMP). After the motor speed has reached the product speed ("Labeling parameter - Speed selection - Fixed speed" = GOOD SPEED), the motor keeps holding this speed.

**4-Wait for LSC input:** the stepper motor is still moving (speed = product speed) until the label sensor (LSC) has detected a new label (end of actual label). The stepper motor is still moving the label (with the product speed) until the remaining distance to the calculated stop position of the label (following the actual label) in the front (on the dispensing edge) is equal to the length of the break sequence = equal to the length of the down ramp distance ("Service - Stepper motor - Deceleration" = DOWN RAMP). This is the start of the down ramp.

**5-Motor stop:** Now the last section of the label movement will get started (deceleration). The correct stop position of the label (following the dispensed label) is defined by the predispensing value and the length of the down ramp (see above) – whereas the length of the down ramp always depends on the height of the product speed.





...continue with Standard Mode

**Speed - Compensation** (SPEED COMP): Compensation value = distance resulting from the speed difference between product speed and ramping up motor speed – while in the RAMP UP section of the label movement. Remember: the higher the product speed the higher the compensation value! This explains the <u>pre</u> starting of a labeling sequence :

#### Position delay = POSITION minus SPEED COMP."

The perfect time where the label has to be placed onto the product is where the motor speed is equal to the product speed (after the ramp up sequence and before the ramp down sequence get started)! Because we always like to have the same label position on the product, the start point where a new labeling sequence get started has to be determined and set according to the speed dependable calculated "SPEED COMPENSATION" value.

**Special case:** a <u>new</u> detected gap (between two labels) within the defined predispensing distance will result in a corresponding error-/warning message: "Predispensing too long" (depending on the setting of the "Configuration – Error handling – Predispensing too long" parameter).

Counteraction: reduce the predispensing value or the product speed!





#### "Fast Speed" Mode

#### "Fast Speed Mode" = fast labeling with short labels!

The course of action in the "Fast Speed Mode" is similar to the above described "Standard Mode". However – a few parameters are treated different, to make the unit running faster (especially for short labels).

In this mode the detection of the gap between two labels (by the label sensor - marked as LSC) will normally fall into the up ramp section of the labeling sequence (see drawing below). This denotes that after the label gap has been detected, the remaining part of the label has to be checked/calculated constantly and the process has to be continued as following:

#### Case 1:

The labeling sequence can proceed as usual (ramp up to product speed – keep running with product speed – ramp down to stop). This is about the "Standard Mode" (see above). The critical point in this labeling process will get reached where the labeling speed is not able anymore to speed up to the (increased) product speed ("Labeling parameter – Speed selection – Tacho"). This is the point where the unit switches to case 2 = "Fast Speed Mode".

#### Case 2:

The motor will have not enough time to completely ramp up to the level of the actual product speed. While in the acceleration phase up (ramp), the firmware is continually checking/calculating the remaining distance/time needed to correctly decelerated (ramp down) and stop at the defined predispensing position (on the dispensing edge). The point where the stepper motor will be switched from acceleration to deceleration is called the "point of return". The predispensing and the position values are speed dependable parameters!



As soon as the labeling speed can NOT reach the product speed anymore (see drawing above), the "Fast Speed Mode" will be activated.

This mode enables the unit to run a high product/ label cadence – however the label speed will not reach the product speed (the product speed will always be faster than the labeling speed) – what - of course - can complicate the "glue down" process (label to product).



... continue with

"Fast Speed Mode"

#### **Observation / Adjustment:**

Before starting <u>and/or while running</u> a label dispensing sequence, a few important parameters have to be checked by theCollamat NG firmware:

- Position: Check of the Position value / Position delay (see above). A too short value connotes: the motor is not able to speed up and reach the calculated "point of return" this is the point where the acceleration phase has to be changed to the deceleration phase (see drawing above)! A too short value can result in an error- or warning-message on the display (depending on the setting of the "Configuration Error handling Position to short" parameter).
- Predispensing: Check of the Predispensing value (see above). The distance from the physical position of the label sensor (LSC) to the desired stop position of the label on the dispensing edge is called "Predispensing" ("Labeling parameter -Predispensing"). A too short value connotes: the motor is not able to speed down from the "point of return" to the desired stop position. A too short value can result in an error- or warning-message on the display (depending on the setting of the "Configuration – Error handling - Predispensing to short" parameter).
- Error handling: The behavior of the corresponding "Fast Speed" message (on the display) can be adjusted in the menu "Configuration Error handling" (setting a specific error-/warning condition to be ignored, to warn or to stop).

#### Advantage of the "Fast Speed Mode" vs. "Standard Mode":

Because the stepper motor is not able to completely speed up to the product speed, the speed up distance/time can be shorter.

Because the stepper motor does not need to speed down from the product speed – but rather from the "point of return" - which is always lower – the ramp down distance/time can be shorter.

Because of shorter position- and predispensing-values and therefor shorter rump up and ramp down distances/times, the amount of products per time (product cadence) can be increased dramatically!



#### 3.9 Electrical rewinder

#### 3.9.1 Short description

The rewinder unit (also called rewinder) is to rewind the carrier paper (carrier foil) after labeling. The carrier paper is a waste product, which can be recycled in most cases.

For dispensing speeds greater than 40-60 m/min or for very wide labels, an (optional) electrical rewinder is needed. The rewinder pendulum serves to control the speed (power) of the rewinder motor (DC), which drives the rewinder core. The control unit - consisting of the pendulum mechanics and the pendulum sensor board - sends a control signal corresponding to the pendulum position to the 4-quadrant motor controller (called 4Q-MC in the following) via control input J1. This input controls the rewinder motor and rewinder core - onto which the carrier paper is rewound - based on the status of the control cable signals.

The Collamat-NG is capable of accommodating carrier paper sizes for label rolls up to 400 mm in diameter (carrier paper diameter on the rewinder: approx. 280 mm).

Optional: A ratchet disk is located on the back of the rewinder gear wheel with 25 black and white marks on it (the so-called incremental encoder). Using special reflective sensors on the sensor board, the speed and rotational direction of the rewinder is monitored and controlled.

The hardware-based coding of the dispensing direction is performed when the sensor board is installed. For a dispenser that runs from "left to right" (called a "right-sided dispenser" by Collamat AG), the internal assembly screw in the sensor board is coded to "right".

The monitoring cable transmits the following parameters (main computer to/from 4Q-MC) via J3 control inputs/outputs:

- Paper width narrow / wide adjustable at operator panel
  - On / Off: enable / disable

If the dispenser is in error mode, the following occurs: The rewinder is turned off (disabled) adjustable at operator panel

Run / Error: The rewinder motor controller sends a RUN or ERROR signal to the main computer depending on the system status (if the dispenser is in error mode, the rewinder is turned off (disabled)



#### 3.9.2 Status LEDs on the MC

#### Status LED

Status of the 4Q rewinder motor controller

LED	Description
GREEN	Operating voltage active
RED	The motor controller is in error mode or disabled.

#### 3.9.3 Electrical connections

#### Socket J3 - CONTROL

Pin	Description			
1	RW_WIDTH	- narrow / wide	- paper width	
2	GND			
3	RW_ENABLE	- on / off	- enable / disable motor	
4	GND			
5	RW_ERROR	- Run / Error	- 4Q-MC error ?	
6	GND			

#### Socket J1 – CONTROL (Version X1 and X2)

Pin	Signal	Description
1	GND	Ground
2	TURNA	Rotation direction phase A
3	TURNB	Rotation direction phase B
4	U4(S1)	Sensor position 1 - pendulum position
5	U3(S2)	Sensor position 2 - pendulum position
6	U2(S3)	Sensor position 3 - pendulum position
7	U1(S4)	Sensor position 4 - pendulum position
8	LR	left / right (coded during installation
9	NC	not used
10	VCC	+5VDC



#### Socket J1 – CONTROL (Version A)

Pin	Signal	Description
1	GND	Ground
2	NC	not used
3	U4(S1)	Sensor position 1 - pendulum position
4	U3(S2)	Sensor position 2 - pendulum position
5	U2(S3)	Sensor position 3 - pendulum position
6	U1(S4)	Sensor position 4 - pendulum position
7	LR	left / right (coded during installation
8	VCC	+5VDC

#### Socket J4 – PROGRAMMER

Pin	Signal	Description
1 - 5		Programming device connection (e.g. MPLAB ICD2)

#### Socket J2 – POWER / MOTOR

Pin	Signal	Description
1	~	Transformer connection (black cable)
2	~	Transformer connection (black cable)
3	M+	Motor connection (red cable)
4	M-	Motor connection (black cable)





mounted on cooling bracket

or



#### 3.9.4 Voltage supply

#### Transformer

#### 3.9.5 Mechanics

**Drive / Control** 

To operate the electrical rewinder unit, a special transformer (460VA) is needed that supplies the necessary energy to the 4Q-MC (24V AC).

The following points must be checked before first using the electrical rewinder:

- belt tension (belt tensioner)
- pendulum tension of the control pendulum (spring)
- pendulum position (position of the control tab over the sensor board)
- Status LED (on the motor controller board)



Rewinder sensor board (HMC0608X1)

Here are the controls in detail:

- Belt tension .....
- Pendulum tension .....
- Setting up the control tab using the example of a "right-sided" dispenser:
- Waiting position: The pendulum is at the lowest position; the carrier paper is taut. Check the control tab over the sensor board the right outside sensor on the board is covered by the tab - the three other sensors (inside) are visible:
- Speed level 1: only the two right-most sensors are covered by the control tab = slow rewinding speed.
- Speed level 2: only the three right-most sensors are covered by the control tab = medium rewinding speed.
- Speed level 3: All sensors are covered by the control tabs = fast rewinding speed.
- Paper tear: The right sensor is NOT covered by the control tab.
- Status LED: Green LED = Powersupply OK Green LED + red LED = Error or machine not
  - cleared for use

#### 3.9.6 Modifications: Rewinder passive to active



Equip a Collamat with an active rewinder

To retrofit a passive rewinder dispenser to an active rewinder system (dispenser with electric rewinder), a special retrofitting set is available.

The retrofitting set contains the following components:

- Transformer 460VA Transformer with separate
- DC Motor
- winding 24 / 120V AC EC050.240
- 4Q-MC

Sensor board

Control cable

Mechanics

Instructions

- HMC0607x HMC0608x
- Monitoring cable HMC06CA11x
  - HMC06CA18x
  - All additional mechanical parts
    - Retrofitting and setup instructions

#### **Retrofitting at Collamat**

You can also have your Collamat-NG dispenser with passive rewinder retrofitted at any time - ask Collamat AG or your local supplier.

Of course, all Collamat-NG devices are still adjustable for our customers' new labeling needs, even after delivery. With the appropriate retrofitting set, devices can be widened, narrowed or changed from left to right.

Ask your dealer about retrofitting offers.



Control and sensor connections



Transformer and motor connections



#### 3.10 Non-stop labeling translate

**3.10.1 Short description** Using two Collamat NG, it is possible to label goods without interruptions. For this purpose, both Collamat NG units must be connected to one another electrically. The necessary connections are shown in Fig.3.9.5. Both Collamat NG units are aligned as shown in Figure 3.9.2.

For speed mode "TACHO", using an optional incremental encoder (called encoder here); the encoder is supplied with 24V DC from both dispensers. The encoder signals and the supply voltage for the encoder are routed over the non-stop cable. The encoder is normal plugged into the M12 socket of the MASTER Collamat NG.

Im Nonstopbetrieb überwacht der Master den Etikettiervorgang. Waren die den Warengutsensor GSC des Masters passieren, werden hochgezählt. Verlassen diese Waren beim Warengutsensor GSC des Slaves die Anlage, werden sie wieder abgezählt (siehe MA-SL-Zähler = Nonstopzähler). Ist der Master aus irgendeinem Grund nicht in der Lage zu etikettieren, gibt er dem Slave den Auftrag (NSTP-OUT) die Etikettierung zu übernehmen, sobald die erste, nicht etikettierte Ware am Warengutsensor GSC des Slaves erscheint. Nun beginnt der Slave zu etikettieren. In der Zwischenzeit kann die Ursache, die zum Stillstand des Masters führte, behoben werden. Der Slave etikettiert nun die Waren solange, bis er durch ein Fehlverhalten (Fehler/Warnung) nicht mehr in der Lage ist weiter zu etikettieren – oder bis die "Changeover"- Taste (个) am Slave gedrückt wird (1). Jetzt gibt der Slave dem Master den Auftrag zurück. Der Master beginnt unverzüglich mit dem Etikettieren. Dabei kann es vorkommen, dass beide Spender für eine kurze Zeit gleichzeitig etikettieren (falls der MS-SL-Zähler > 0 resp.). Erreicht nun das erste vom Master - etikettierte Warengut den Slave, so erhält dieser vom Master einen Stopbefehl. Jetzt kann die Ursache, die zum Stop des Slaves führte behoben werden.

Der Master hat die ganze Zeit die Kontrolle über beide Spender, d.h. er weiss jederzeit welche Waren auf welchem Spender etikettiert werden. In der Nonstop-Anzeige des Bedienteils (Master) lässt sich anzeigen, wie viele Waren sich zwischen den beiden Warengutsensoren der Spender befinden (MA-SL-Zähler).

Kommt es aus irgendeinem Grunde zu einem Fehler, bei dem beide Spender nicht mehr etikettieren können, müssen alle Waren, die sich zwischen den beiden Warengutsensoren befinden, entfernt werden und der MA-SL-Zähler muss gelöscht werden. Kann die Ware nicht entfernt werden (Formulare, Folien, Schalen,...) so muss der MA-SL-Zähler entsprechend eingestellt/editiert werden.

**Explanation:** MA-SL-Counter = Nonstop counter

 the external input line COUNTER / CH\_OV can also be used to start the change-over sequence (in nonstop mode only) !



3.10.2 Assembly

Components



Setup for two Collamat NG units in non-stop operation

Machine type: right-sided Dispenser left: Master Dispenser right: Slave

- 1 = goods sensor (Master GSC)
- 2 = goods sensor (Slave GSC)
- 3 = incremental encoder (Master + Slave TACHO)
- 4 = Non-stop cable(HMC06CA29)



#### 3.10.3 Setup

- When the system is wired for non-stop operation, setup is performed as follows:
  - Stop the transport belt or product flow
  - Remove the goods between the two GSC units or edit nonstop counter GOODS MA-SL) accordingly
  - Set both Collamat NG units with <run/stop>-key to STOP
  - Set up both dispensers:
  - Select the MASTER non-stop mode on the master
  - Select the SLAVE non-stop mode on the slave
  - Set the Collamat NG Master with the <run/stop>-key to "ready"
  - Set the Collamat NG Slave with the <run/stop>-key to "standby"
  - Start the transport belt or product flow.

The goods will now be labeled in non-stop operation. If any condition causes stoppage of one of the dispensers, proceed as follows:

- Correct the error status on the stopped dispenser
- Confirm the error message with ENTER
- press <run/stop> key = set dispenser to Standby mode
- press <up>-key (on active unit = Slave) = change over to master (Changeover)

If an error occurs in non-stop mode that stops both dispensers, the error must first be corrected and the error message has to be confirmed (<enter>-key. Then, remove all goods between the GSC units before clearing the non-stop counter on the Collamat NG Master. An erroneous slave demanding an immediate stop will inform the master by sending a short puls on the NSTP-OUT line (= NSTP-IN on the master nonstop connector) –only in the situation for nonstop counter (MA-SL-counter) > 0.

Setup or restart after a nonstop error (stop): normally the products between master and slave have to be removed and the nonstop counter has to be reset. There are situations where the products can NOT be removed (form-, foil- or mold-labeling). In these cases the nonstop counter has to be edited accordingly. To monitor and set up non-stop operation, the freely-configurable operator panel can be set to show/edit the number of goods between the two good scanner (GSC) units.

Position settings and goods suppression are applied to both goods sensors. The distance from the dispenser edge of each dispenser to the corresponding goodscanner (GSC) should be identical.

#### Advise:

The SLAVE has to be used – wherever possible – as so called "Emergency Unit". As soon as the MASTER is "Ready", it is very advisable to hand over the control to the MASTER (Change-over) if the MASTER is in Standby mode.

#### Why:

A faulty SLAVE (which has to be stopped immediately) is not able to label the products between MASTER and SLAVE anymore (after the error has occurred). If there are products between MASTER and SLAVE the nonstop unit (both dispenser) have to be stopped immediately (nonstop-error)! If there are no products between MASTER and SLAVE the MASTER can take over without problems.



#### 3.10.4 Nonstop Control-Table

		Voltage*	Voltage*	Products	Products	
		Pin 13 to GND	Pin 11 to GND	btw. MS-SL	btw. MS-SL	
Master (MS)	Slave (SL)	MS: NSTP-OUT	MS: NSTP-IN	Counter MA-SL	With label	Comment
stopped**	stopped**	0	0	0	0	
stopped**	ready	0	24	0	0	
ready	stopped**	24	0	0	0	
ready	standby	24	24	0	0	
standby	ready	0	24	0	0	
stopped**	stopped**	0	0	> 0	0	
stopped**	ready	0	24	> 0	0	
ready	stopped**	24	0	> 0	> 0	
ready	standby	24	24	> 0	> 0	
standby	ready	0	24	> 0	0	
ready	standby	24	24	0	0	
ready	standby	24	24	1	1	
ready	standby	24	24	2	2	
$\uparrow$						Change over MS->SL
changeover	standby	24	24	3	2	NSC +1 -Etikette auf Prod. von MS
changeover	standby	24	24	4	2	NSC -1 -Etikette auf Prod. von MS
changeover	standby	24	24	3	1	NSC -1 -Etikette auf Prod. von MS
standby	ready	0	24	2	0	NSC -1
standby	ready	0	24	1	0	NSC -1
standby	ready	0	24	0	0	NSC -1
standby	ready	0	24	1	0	
standby	ready	0	24	2	0	
standby	ready	0	24	0	0	
standby	ready	0	24	0	1	
standby	ready	0	24	0	2	
$\uparrow$						changeover SL->MS
ready	changeover	0	0	2	2	
ready	changeover	0	0	1	1	
ready	standby	24	24	0	0	
ready	stopped**	24	0	1	1	
ready	stopped**	24	0	2	2	

\* NSTP-IN and NSTP-OUT measured on Nonstop connector of the Masters (to GND = Pin 14/15)

\*\* Pause or Stopped Changeover = change over from -> to (MA -> SL or SL-> MA)

### 3.10.5 Nonstop cabeling







### 4.1 Inputs + Outputs (Electronic)

Explanation	This chapter describes the signals of the Collamat NG in detail. All input and output signals are described electrically and functionally. The plug positions on the "SIGNALS" connection plate and the pin positions of the input/output plug adapter have already been described in the chapter <i>"SIGNALS" side connection plate</i> .
	All inputs and outputs are equipped with filter components to protect against electromagnetic interference. These components also prevent interference resulting from electrostatic discharge from interfering with the function of the Collamat NG. However, rules to avoid these types of interference are to be observed when setting up a labeling system. These rules are described in a later chapter.
4.1.1 Inputs	
Optical coupler inputs	The optical coupler inputs allow external devices to be connected that may be independently earthed or have a separate earthing potential. This prevents equalizing currents over the inputs and

potential. This prevents equalizing currents over the inputs and prevents faults. We distinguish between optical coupler inputs with common ground potential (GND), optical couplers with common +24V potential and optical couplers with separate anode and cathode cables.

Figure xx shows a diagram of the optical coupler inputs with a common GND potential.

#### Optical coupler input with common GND



#### Explanation

With this type of input, both PNP as well as push-pull output signals can be connected. The input is active if a current of approx. 7.5 mA (at 24V) flows through the LED of the optical coupler. The maximum input voltage is 28V.

The following input signals fall under this category:



#### NPN inputs with common GND

Input	Description	
DISP	Pushbutton on adapter – dispense one label	
START	Change operating mode – from STOP to RUN	
STOP	Change operating mode – from RUN to STOP	
READY	Ready input	
LOCK_INV	Lock inverse input	
LOCK	Lock input (LOCK != LOCK_INV)	

#### Optical coupler input with common +24V



#### Explanation

The figure above shows a diagram of the optical coupler inputs with a common +24V potential. This corresponds to most internal input signals.

With this type of input, both NPN as well as push-pull output signals can be connected. The input is active if a current of approx. 7.5 mA (at 24V) flows through the LED of the optical coupler. The maximum input voltage is 28V.

The following input signals fall under this category:

#### NPN inputs with common +24V potential

Input	Description
RTA_ERR	Error signal for step motor end stage
TUNIT	Traction unit open
LLO	Low label supply in unwinder
RWF	Rewinder full



OOL

Out of labels

#### Optical coupler input with separate cables



#### Explanation

The figure above shows a diagram of optical coupler inputs with separate anode and cathode cables.

With this type of input, PNP, NPN as well as push-pull output signals can be connected. The input is active if a current of approx. 7.5 mA (at 24V) flows through the LED of the optical coupler. The maximum input voltage is 28V.

The following input signals fall under this category:

#### NPN inputs with separate anode and cathode cables

Р	N	Description
GSC_P	GSC_N	Goods sensor input
COUNTER_INP	COUNTER_INN	Counter input
NSTP_INP	NSTP_INN	Non-stop input
RWE_ERROR_INP	ERROR_RW_INN	Rewinder error input
PRODUCT_INP	PRODUCT_INN	Non-stop counter input

#### Rapid optical coupler input with separate cables

On: 4 mA @ 24V DC Off: 0 mA: Vmax: 28V DC
---





#### Explanation

The figure above shows a diagram of the rapid optical coupler inputs with separate anode and cathode cables.

With this type of input, PNP, NPN as well as push-pull output signals can be connected. The input is active if a current of approx. 4 mA (at 24V) flows through the LED of the optical coupler. The maximum input voltage is 28V.

The following input signals fall under this category:

#### Rapid optical coupler inputs

Input	Description
TACA_P	Incremental encoder (tacho) - phase signal A
TACB_P	Incremental encoder (tacho) - phase signal B

#### 4.1.2 Label sensor – inputs

Explanation

The only **analog** inputs in the Collamat NG are the two inputs of the label sensor.

The standard label sensor consists of an OP550A phototransistor receiver that is built into the housing of the sliding label sensor head. The active signal passes through a shielded cable to the adapter electronics in the adapter housing.

Here, the signal is converted and sent to the main control unit (in the Collamat NG housing) over the adapter ribbon cable. A rapid operation amplifier switch sends the analog active signal to the slave controller.

Figure below shows a basic diagram for the analog inputs:





 Basic diagram – Analog sensor(s) - Sensor 1 and optional Sensor 2 (analog sensor 2 – only for HMS-units)

 Explanation
 Analog label sensor input - shown here is the example of a "transmissive sensor" - "Sensor 1" on the adapter board

HMC0605 and on the main control board HMC0601.

The following input signals fall under this category of analog inputs:

#### Analog inputs (label sensor 1)

Input	Description
LSC_T	<ul><li>IR- label sensor "transilluminating" - Sensor 1</li><li>CAG "fiber optic" version</li><li>The adapter boards of the CAG and HMS devices are configured for this version.</li></ul>
LSC_R	<ul><li>IR- label sensor "reflecting" - Sensor 2</li><li>HMS "black mark reader" version</li><li>The adapter boards of the HMS devices are configured for this version.</li></ul>

#### Digital input (label sensor 2 - 24V DC - PNP)

The figure below shows a basic diagram for the digital label sensor input:





Explanation

Digital label sensor input - shown here is the example of "Sensor 2" on the adapter board HMC0605 and on the main control board HMC0601.

The following input signals fall under this category of digital inputs:

Input	Description
	e.g. digital forked light barriers (24V DC - PNP) - Sensor 2 CAG "external sensor" version
LSC_R	The adapter boards of the CAG devices are configured for this
	version (see also above).



#### 4.1.3 Outputs

For the outputs, there are different types of switching mechanisms:

#### **PNP** – outputs

The following figure shows a basic diagram for a PNP output:



#### The following output signals fall under this category:

Output	Description
RTA_STEP	Step pattern to the step motor end stage
RTA_DIR	Directional signal to the step motor end stage
FLAP	Control signal for the magnet flap adapter

#### **Optical coupler – outputs**

**Open collector outputs** 

This version of the optical coupler outputs uses separate collector and emitter cables.

The Figure below shows a basic diagram for these optical coupler outputs:





#### The following output signals fall under this category:

Р	Ν	Description
RW_ENABLE_C	RW_ENABLE_E	Rewinder enable input
RW_WIDTH_C	RW_WIDTH_E	Rewinder width input
ERR_OPT_C	ERR_OPT_E	Error Output
WAR_OPT_C	WAR_OPT_E	Warning Output
RUN_OPT_C	RUN_OPT_E	Run Output
PROD_OUT_C	PROD_OUT_E	Product-Counter Output
IFEED_C	IFEED_E	FEED Output (isolated input)
ADA_HOME_C	ADA_HOME_E	Adapter in Home Position Output

#### Open collector outputs Emitter at ground

For the next optical coupler output version, the emitter is permanently connected to GND and has a separate connection for the +24V supply.

The following figure shows a basic diagram for this optical coupler output:



The following output signals fall under this category:

Р	N	Description
NSTP_POW	NSTP_OUT	Control signal, output for non-stop control
GSC_OUT_P	GSC_OUT	Goods sensor input forwarded to this output



Open collector output not galvanically separated! This is an internal output signal on the Collamat NG and may only be used for controlling the label sensor transmitter stage.

The following figure shows a basic diagram for this output:



#### The following output signal falls under this category:

Output	Description
LSC_PWM	Control of the label sensor transmitter stage (TCY)

Power Outputs Not galvanic separated! Power outputs are special outputs designed - amongst others - for status indicators (LED's).

#### Max. output load: 100mA !



#### The following output signals fall under this category:

Ausgang	Beschreibung
RUN	RUN output (online) Used to connect a "green" indicator " LED.
WAR	WAR output (Warning) Used to connect an "orange" indicator " LED.
ERR	ERR output (Error) Used to connect a "red" indicator "LED.

## 4.2 Inputs + Outputs (description)

## 4.2.1 Input details

Inputs

Input	Description	
RTA_ERR	Error signal for step motor end stage (optical coupler input – 3K3 series resistor)	
TUNIT	The signal <b>TUNIT</b> serves to monitor the traction unit. A forked light barrier is located there to monitor the closing mechanism of the traction cylinder. (optical coupler input – 10K series resistor)	
LLO	The signal LLO (Label LOw) serves to monitor the roll diameter at the unwinder. The standard monitoring sensors from Collamat AG are fitted with NPN outputs (active L). (optical coupler input – 10K series resistor)	
RWF	The RWF signal (ReWinder Full) serves to monitor the roll diameter of the rewinder. The standard monitoring sensors from Collamat AG are fitted with NPN outputs (active L). (optical coupler input – 10K series resistor)	
OOL	The OOL input (Out Of Label) serves to monitor the label strip. The paper brake of the Collamat executes this monitoring function (paper tear?). If no paper is located under the brake shoe of the paper brake, the OOL input is activated. The standard monitoring sensors from Collamat AG are fitted with NPN outputs (active L). (optical coupler input – 10K series resistor)	
GSC	The GSC_P / GSC_N output is the goods sensor input for the Collamat NG. Configuring the goods sensor input: see "SIGNALS" connection plate under xx (optical coupler input – 2K2 series resistor)	
PRODUCT_INX	The PRODUCT_INP / PRODUCT_INN input serves the Collamat NG "MASTER" for goods counting in non-stop operation. (optical coupler input – 10K series resistor)	
NSTP_INX	The input NSTP_INP / NSTP_INN connects two Collamat NG units for non-stop operation. The cable connections for non-stop operation is described in the chapter "Non-stop". The input is connected to the non-stop plug. This is an "internal" signal transmission for the Collamat NG. (optical coupler input – 10K series resistor)	
RWE_ERROR	The RWE_ERROR_INP / RWE_ERROR_INN input transmits errors from the rewinder. (optical coupler input - 10K series resistor)	



#### Inputs (continued)

Input	Description	
COUNTER_INX or CH-OV	The COUNTER_INP / COUNTER_INN input serves to count goods or events (was PRTERR_X). This external input ( <b>CH-OV</b> ) will be used in Nonstop-Mode to start the Change-over sequence (equal to the Change-over-key( $\uparrow$ ) on the operator panel) (optical coupler input – 3K3 series resistor)	
ERRIN or LOCK-INV	ERRIN – input (external error input) or (optional) Locks the dispenser with the emergency stop switch (palm button) for version with LOCK and LOCK_INV combination input = two-channel emergency stop connection (SIL) (Optical coupler input - 3K3 series resistor)	
LOCK	Locks the dispenser with the emergency stop switch (palm button) LOCK != LOCK_INV, meaning that the emergency stop switch in the NOC or NCC versions (secure input) causes an immediate controlled stop of the motors (traction motor and optional rewinder motor) when activated and/or in case of short-circuit or interruption of one or more connection cables. The calculated SIL of <1 does not require an emergency stop function. Collamat AG includes a two-channel emergency stop system anyway (configurable in user menu). (optical coupler input - 3K3 series resistor) The START input can be used to start the Collamat NG. This function corresponds to the RUN/STOP button on the operator panel. If the signal is activated when the system is stopped, the Collamat will be started (RUN). The RUN output is switched based on the system's current status. Goods counting is continued. Error messages are not cleared (optical coupler input – 3K3 series resistor)	
START		
STOP	The STOP input is used to stop the Collamat. This function corresponds to the RUN/STOP button on the operator panel. If the signal is activated when the system is running, the Collamat will be stopped (! STOP). The RUN output is switched based on the system's current status. Goods counting is continued. Error messages are not cleared. (optical coupler input – 3K3 series resistor)	
DISP	The pushbutton on the adapter is connected to this input. The FEED button on the operator panel is connected to this input. Pushing the button activates a dispense process = dispenses one label. (optical coupler input – 10K series resistor)	
READY	The READY signal is used to signal the Collamat that connected peripheral devices such as a flat printing system or a hot stamp are ready or not ready. If the signal is active, meaning that the PNP output of a peripheral device is switched to +24V, labeling may not proceed. An error message is output. (optical coupler input – 3K3 series resistor)	



#### Inputs (continued)

Input	Description
LSC_T	Sensor 1: (fiber optic type) The LSC_T input is connected with the transmissive label sensor receiver. To allow for highly precise sensor function, this input is given a very small damping time. With this input, only the CAG fiber optic receiver can be used as a label sensor receiver.
LSC_R	CAG - Sensor 2: CAG – variety: (digital PNP 24VDC sensor) The LSC_R input can be connected with an optional standard PNP label sensor (e.g. a forked light barrier). To allow for highly precise sensor function, this input is given a very small damping time. All CAG devices have Sensor 2 configured as a digital input (CAG = Collamat AG). Note: The input configuration for the label sensor inputs is found on the corresponding adapter board. (HMC0605 or HMC0606) = Configuration for CAG.
LSC_R	<ul> <li>HMS - Sensor 2:</li> <li>HMS - variety: (black mark reader)</li> <li>The LSC_R input is connected with the HMS reflective label receiver. To allow for highly precise sensor function, this input is given a very small damping time. With this input switch configuration, only the HMS black mark reader receiver can be used as a label sensor. This applies to all HMS devices (HM Systems S/A).</li> <li>Note: The input configuration for the label sensor inputs is found on the corresponding adapter board. (HMC0605 or HMC0606) = Configuration for HMS.</li> </ul>
TACA_P	Incremental encoder – phase signal A.
TACB_P	Incremental encoder – phase signal B. (optical coupler input – 5K6 series resistor)





## 4.2.2 Output details

#### Outputs

Output	Description
RTA_STEP	This signal transmission controls the step motor end stage (speed control). This is an "internal" signal transmission for the Collamat NG. (PNP, 2K2 Shunt)
RTA_DIR	This signal transmission controls the step motor end stage (rotational direction). This is an "internal" signal transmission for the Collamat NG. (PNP, 2K2 Shunt)
FLAP	The FLAP signal controls the electromagnet flap adapter. The ADAPTERMAGNET setting allows this signal to be turned on or off for labeling. If turned on, FLAP is activated together with the IFEED signal. FLAP can be extended by a configurable amount of time beyond the IFEED signal. If a new labeling process occurs during the extension time of FLAP, FLAP will remain active. To control the electromagnet flap adapter, a special adapter board HMC0606x (MFA-Adapter-PCB) is necessary. (PNP, 2K2 Shunt)
RW_ENABLE_X	The output RW_ENABLE_C / RW_ENABLE_E controls the (optional) electrical rewinder module (releases the motor controller stage of the rewinder module). This is an "internal" signal transmission for the Collamat NG. (Open collector output - no shunt)
RW_WIDTH_X	The RW_WIDTH_C / RW_WIDTH_E output controls the (optional) electrical rewinder (paper width setting narrow / wide). This is an "internal" signal transmission for the Collamat NG. (Open collector output - no shunt)
IFEED_X FEED	The IFEED_C / IFEED_E signal is always active while the step motor is turning. This signal can communicate, for example, to an external printer unit that paper is moving or not. The flat printer system analyzes the curves of this signal for printing to determine that the paper is not moving. The time sequence of the IFEED signal is shown in chapter 3.5. The <b>IFEED</b> output is separated from the rest of the electronics with an optical coupler. The signal can be used to start an external printer in a potential-free manner. Using the optical coupler, the signal can be switched for NPN or PNP inputs. The polarity of IFEED can be programmed using the operator panel. NORMAL = active while label is moving. INVERS = opposite to NORMAL, This adjustment is often used for tamp printer . (Open collector output - no shunt).



#### **Outputs (continued)**

Output	Description
NSTP_OUT NSTP_POW	The NSTP_POW / NSTP_OUT connects two Collamat NG units for non-stop operation. The cable connections for non-stop operation are described in the chapter <b>"Non-stop"</b> . This is an "internal" signal transmission for the Collamat NG. (Open collector output – no shunt – emitter at GND)
GSC_OUT	The signal GSC_OUT_P / GSC_OUT is a copy of the GSC input signal (GSC input = GSC output). (Open collector output – no shunt – emitter at GND)
LSC_PWM	This is an "internal" output signal on the Collamat NG and may only be used for controlling the Collamat NG label sensor transmitter stage.
PRODUCT_OUT	This is an "internal" output signal on the Collamat NG that is used for control during non-stop operation. (Open collector output - no shunt)
ERR	Error POWER output (max. 100mA) Used to connect a "red" indicator LED.
WAR	Warning POWER output (max. 100mA) Used to connect an "orange" indicator LED.
RUN	Run POWER output (max. 100mA) Used to connect a "green" indicator LED.
ERR_OPT_X	The output ERR_OPT_C (Collector) and ERR_OPT_E (Emitter) shows the error status
WAR_OPT_X	The output WAR_OPT_C (Collector) and WAR_OPT_E (Emitter) shows the warning status
RUN_OPT_X	The output RUN_OPT_C (Collector) and RUN_E (Emitter) shows the RUN status (online mode)

CAG = Collamat AG - Switzerland HMS = HM Systems A/S - Denmark



## Maintenance

## 5 Maintenance

5.1 Safety

**Basics** 



#### WARNING!

## Danger of injury due to improper maintenance work!

Incorrect maintenance can cause serious injury or damage.

Therefore:

- Maintenance work may only be performed by qualified and owner-authorized and trained personnel.
- Inform operating personnel prior to starting maintenance and service work.
- Before starting work, ensure that adequate conditions for assembly are present.
- Ensure that the assembly location is orderly and clean! Loose or scattered components and tools can cause accidents.
- If components are replaced:
- Pay attention to correct fitting of replacement parts.
- Reinstall all mounting elements appropriately.
- Observe the correct screw-tightening torques.
- Before turning the system back on, ensure that all covers and protective equipment are installed correctly and function properly.
- After completing maintenance work, check safety equipment for functionality.



#### WARNING!

#### Danger of injury due to compressed air!

The compressed air in the pneumatic system can escape without warning and set pneumatically driven components in motion, causing serious injuries.

Therefore, before starting any work:

- Turn off the pneumatic system and ensure that it cannot be turned on.
- Depressurize all components which are under pressure.

#### Maintenance

#### **Electrical equipment**



#### DANGER!

Danger of death due to electrical current!

Contact with live components can cause danger of death.

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Electrically driven components can start to move without warning and cause extremely serious injuries.

Therefore:

- Before beginning work, turn off electricity supply and ensure that it cannot be turnedback on.
- All work on the electrical systems, on individual electrical components and on connections may only be performed by trained electricians.

#### Personal protective equipment

For all maintenance work, the following must be worn:

- Industrial safety clothing
- Protective gloves
- Safety footwear
- Goggles

## Securing against switching on again



#### DANGER!

## Danger of death due to unauthorized re--activation!

During maintenance, there is a danger that the power supply will be switched on again without authorization. This causes danger of death for those in the danger area.

Therefore:

Before starting work, turn off all energy supplies and ensure that the system cannot be turned back on.

#### **Environmental protection**

- Observe the following environmental protection instructions when performing maintenance:
- At all lubrication points which are provided with lubricant manually, remove escaping, used, or surplus grease and dispose of according to the local regulations.
- Collect drained oil in suitable containers and dispose according to the local regulations.



#### 5.2 Maintenance schedule

The following sections describe the maintenance work necessary for optimum and fault-free operation. The maintenance intervals are to be observed.

If the regular checks show increased wear of individual components or functional assemblies, the operator must shorten the maintenance intervals according to the actual wear. Changes compared with normal operation (higher power consumption, temperatures, vibrations, noise etc, or the triggering of monitoring devices) are signs that system function is impaired. To avoid faults which could cause direct or indirect injuries or damage, the maintenance personnel must be informed immediately.

In case of questions regarding maintenance work and intervals: Contact the manufacturer (Service address  $\rightarrow$  Page 2).

In addition to these operating instructions, the instructions in the Appendices for the installed components also apply. The information which they contain – in particular the safety information – must be observed!

Interval	Maintenance work	To be performed by	
Daily	Clean dirt, dust and adhesive deposits from printer and applicator (see Chap. 8.3)	Operator	
	Check ease of movement of moving parts		
	Visual inspection of condition and damage to the machine		
Monthly	Clean dirt from entire machine	Operator	
	Check condition and correct function of electric cables, switches and safety devices	Qualified electrician	
Every 6 months	Check all fixing screws for tightness and tighten if necessary. Observe screw tightening torques!	Operator	

#### Maintenance

### 5.3 Cleaning

If superficial dirt is noted, proceed as follows:

**1.** Switch off the machine and secure against switching on again.

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- 2. Remove dirt correctly. Note:
  - Do not use aggressive cleaning agents.
  - Absorb oil deposits with oil-absorbing materials (e.g. sawdust).
  - Observe local regulations to dispose of cleaning cloths and processing residues in an environmentally friendly manner.
  - After cleaning work, check that all opened covers and safety devices are closed and function correctly.



#### **BEWARE!**

The device can be damaged by incorrect cleaning!

Aggressive cleaning and cleaning supplies can damage or destroy the guide components, compressed air hoses, electrical cables, sensors and nearby components. Therefore:

- Do not use cleaning agents with aggressive ingredients.
- Never remove adhesive residues with sharpedged or pointed objects, knives or similar tools.



#### INFORMATION!

Remove adhered labels as soon as possible. The longer they adhere to the machine, the stronger the adhesion!



#### Faults, repair and maintenance work

## 6 Faults, repair and maintenance work

This chapter describes the possible causes of faults, and the work needed to remedy these.

If there is an increase of similar faults due to greater than average use, the maintenance intervals must be shortened according to the actual use.

Contact the manufacturer in case of faults which cannot be remedied with the aid of the following information ( $\rightarrow$  S. 2)!

### 6.1 Safety

Basics



## WARNING! Danger of injury through incorrect remedy of faults!

Incorrect remedy of faults can cause serious injury or damage.

- Only have work for the remedy of faults carried out by qualified and instructed personnel.
- Before starting work, ensure that adequate conditions for assembly are present.
- Ensure that the assembly location is orderly and clean! Loose or scattered components and tools can cause accidents.
- If components need to be replaced: Pay attention to correct fitting of replacement parts. Re-install all fixing elements correctly.
- Observe the correct screw-tightening torques.
- Before turning the system back on, ensure that all covers and protective equipment are installed correctly and function properly.

#### Pneumatic system



#### WARNING!

#### Danger of injury due to compressed air!

This only applies to devices with an air vacuum adapter (AVA). The compressed air in the pneumatic system can escape without warning and set pneumatically driven components in motion, causing serious injuries.

Therefore, before starting any work:

- 1. Switch off the pneumatic system and secure against switching on.
- 2. Depressurize all components which are under pressure.

## Faults, repair and maintenance work



Electrical equipment	<ul> <li>DANGER! Danger of death due to electrical current! Contact with live components can cause danger of death.</li> <li>Electrically driven components can start to move without warning and cause extremely serious injuries.</li> <li>Therefore:</li> <li>Before beginning work, turn off electricity supply and ensure that it cannot be turned back on.</li> <li>All work on the electrical equipment, on individual electrical components and on the connections may only be performed by qualified electricians.</li> </ul>
Personnel	<ul> <li>If not otherwise stated, the work to remedy faults can be carried out by the operator.</li> <li>Some work may only be carried out by specially trained personnel, or only by the manufacturer. This will be separately indicated in the particular description of the fault.</li> <li>Work on electrical equipment may only be carried out by qualified electricians.</li> <li>Replacement of parts and components may only be carried out by specialist personnel.</li> </ul>
Personal protective equipment	<ul> <li>For all work during remedy of faults, the following must be worn:</li> <li>Industrial safety clothing</li> <li>Protective gloves</li> <li>Safety footwear</li> <li>Goggles</li> </ul>
Securing against switching on again	DANGER! Danger of death due to unauthorized re activation!During remedy of faults, there is a danger that the power supply will be switched on again without authorization. This causes danger of death for those in the danger area.Therefore:- Before starting work, turn off all energy - supplies and ensure that the system cannot be turned back on.



**Environmental protection** 

#### Faults, repair and maintenance work

Observe the following environmental protection instructions when remedying faults:

- At all lubrication points which are provided with lubricant manually, remove escaping, used, or surplus grease and dispose of according to the local regulations.
- Collect drained oil in suitable containers and dispose of according to the local regulations.

Conduct in case of faults

#### Always:

- 1. Activate the Emergency Stop immediately in case of faults which cause a direct danger of injury or damage.
- **2.** Switch off all energy supplies and secure against switching on.
- 3. Inform those responsible at the site of the emergency.
- **4.** Depending on the type of fault, have the cause determined and remedied by authorized specialist personnel.

#### 6.2 Restarting after remediation of faults

After remedy of the fault or removal of the cause of interruption:

- 1. Reset the emergency stop device.
- 2. Acknowledge the error message or fault on the control unit.
- 3. Ensure that no-one is in the danger area.
- 4. Start the machine according to the instructions in the chapter "Start-up".

## Faults, repair and maintenance work



## 6.3 Table of faults

Fault	Possible cause	Remedy	To be performed by	
Machine cannot be switched on	No mains power	Check power supply	Operator	
	Defective device fuse	Replace fuse	Electrician or manufacturer	
	Fault at electrical system	Establish and remedy fault	Electrician or manufacturer	
Machine operates, but does not work	Owner-side protective equipment blocked or faulty	Determine the cause and remedy the error. After this, ensure that no persons are in	By specialist authorized by operating company	
	Fault in the safety chain of the entire plant	the danger zone and confirm the interruption.		
Device does not label or labels incorrectly	Incorrect dispenser settings	Check settings: pre- dispensing, pressure roller, incremental encoder, label and goods suppression, READY and LOCK inputs, paper brake, label sensor	Operator	
Error message at operator panel	Remedy the displayed error	Take action as directed by error message	Operator	
	Label supply? Carrier paper? Sensors? Incremental encoder? Paper brake? Pressure roller open?	With every label roll change, remove the carrier paper from the rewinder		
		Check the loop pendulum position (turn off!)		
	Air / vacuum?	Check air pressure / vacuum	Specialist	
COLLAMAT AG OFFLINE	Message at operator panel	Check connection control unit to operator panel	Specialist	
		Master controller error Firmware problem		
PIC offline	Status message at operator panel	Slave controller error Firmware problem	Specialist	
Poor label position	Unsuitable label paper	Insert new label roll	Operator	
	Label guide	Check null edge, parallel - paper course?	Operator	
Drive motor turns off (display on operator panel)	Motor overloaded	Determine the cause of the overloading and remedy it, e.g. high friction of the label strip.	Specialist	
Fault	Possible cause	Remedy	To be performed by	
---	---	--	--	--
Drive motor turns off (display on operator panel)	Motor overloaded	Determine the cause of the overloading and remedy it, e.g. high friction of the label strip.	Specialist	
Motor turns in the wrong direction	Incorrect settings in operator panel - Menu: ROTATION DIRECTION	Correct settings	Operator	
Motor blocked at high dispensing - speed	Excessive friction in paper path	Check paper brake ? Specialist Check unwinder pendulum ? operator		
opoca		Check step motor settings ?		
		Reduce friction, e.g. attach Teflon tape to the separation edge.		
Loose traction cylinder when device is turned on	Traction cylinder flange wedge broken or worn	Check mechanics: Check wedge and replace if necessary.	Specialist	
Other faults	Plug-in connections loose or faulty	Check all plug-in connections for correct seating and function.	Electrician Pneumatic system specialist	

# 6.4 Performing maintenance and repair work

The following is a list of maintenance and repair work that can be performed by a specialist or an electrician (for spare parts, see attachment).

Safety



### DANGER!

Danger of death due to unauthorized re--activation!

When working on the machine, there is a danger that the power supply will be switched on again without authorization. This causes danger of death for those in the danger area.

Therefore:

 Prior to beginning work, turn off energy supply (electrical current, compressed air) to the machine and ensure it cannot be turned on.



## 6.4.1 Replacing the pressure roller

#### **Traction drive**

**Replace pressure roller** 

The pressure roller is a wear part that can suffer wear and damage more or less quickly depending on usage and handling. When labeling, ensure that the carrier paper runs between the pressure roller and the traction cylinder. If the carrier paper is wider than the pressure roller, the roller should be centered on the carrier paper.

#### **Procedure:**

- Unscrew the turning knob (1).
- Unscrew the 3 assembly screws (2) on the fixing bracket (3)
- Loosen the screw (4) on the pressure roller
- Pull the pressure roller (5) out towards the front.
- Slide the new pressure roller onto the pressure axis (6) and install.



- Fixing bracket

3

- 5 Pressure roller
- 6 Pressure axis



# 6.4.2 Changing the traction cylinder

#### **Traction drive**

Replacing the traction cylinder

If the traction cylinder is damaged or worn, it must be replaced. **Procedure:** 

- Unscrew and remove the support screw (1).
- Pull off the traction cylinder (2) from the cylinder bearing (3) and the drive axle.
- Ensure that the wedge (4) is not damaged.
- Install the traction cylinder in the reverse sequence performed for removal.



#### CAUTION!

If possible, install a new wedge during installation. The wedge is a wear part!



- 1 Support screw 3 Cylinder bearing
- 2 Traction cylinder

# Collamat®

#### Setting the belt tension (traction) 6.4.3

#### **Traction drive**

Setting the belt tension

If the label strip is not being transported correctly, the timing belt may need to be adjusted.

#### **Procedure:**

- Remove the housing cover on the back. For this, remove the six screws.
- The belt tension of the labeler is set with a belt tensioner (1) at the timing belt (2).
- Loosen the fixing screw on the belt tensioner slightly using a torsion screwdriver.
- Use a large flathead screwdriver to turn the belt tensioner until the required belt tension is reached.
- Hold the flathead screwdriver in this position. With your other hand, tighten the fixing screw with the torsion screwdriver firmly.
- If the belt tension is too low, the timing belt will not be driven correctly.
- If the belt tension is too high, the step motor will lock up.



#### **INFORMATION!**

The belt tension must be set so that the timing belt does not lock up when the drive motor turns.

Examination: A force (F) pressed on the timing belt with approx. 10N (see green double arrow) should move down the timing belt about 8 mm (1kg ~ 9.8N).



Setting the timing belt tension

Belt tensioner 1 Timing belt

2

- 3 Locking screw
- 4 **Check position**



Replacing the timing belt

# Faults, repair and maintenance work

# 6.4.4 Changing the timing belt (traction)

#### Feed drive

#### Procedure:

- Remove the housing cover on the back.
- Loosen the belt tensioner (1)
- Unplug the cable (2) from the stepper motor (3) at the motor controller (4)



- Remove the three fixing screws (5) at the step motor.
- Remove the step motor and the timing belt
- Remove the thermal paste from the motor and from the assembly block, clean the parts and apply new thermal paste.
- Install the new timing belt in the reverse sequence performed for removal.
- Set the belt tension (see 6.4.3)
- 1 Belt tensioner
- 2 Motor cable
- 4 Motorcontroller SDC06
- 5 Motor fixing screws
- 3 Stepper Motor

# 6.4.5 Changing the OOL spring

Replacing the OOL spring OOL = Out Of Label

#### **Procedure:**

- Remove the plastic screw .
- Replace spring
- Secure the plastic screw with Loctite



# **Collamat**®

# 6.4.6 Changing the drive motor (traction)

Traction drive Replacing the step motor If the drive motor is damaged, it must be replaced.

#### Procedure:

- Remove the housing cover on the back. For this, remove the six screws.
- Loosen the belt tensioner (1)
- Unplug the cable (2) from the step motor (3) at the motor controller (4)
- Remove the three fixing screws (5) at the step motor.
- Remove the step motor (3) and timing belt (6)
- Pull the gear (7) off the motor axis. Remove the wedge.
- Remove the thermal paste from the assembly block (6). Clean the assembly block and apply new thermal paste.
- Screw the gear onto the new motor (use a new wedge (8))
   distance lower disk of gear to motor: 2mm



- Apply thermal paste to the motor.
- Install the new timing belt in the reverse sequence performed for removal.
- If necessary, slide the gear on the motor axis so that the timing belt runs parallel on both gears.
- Set the belt tension (see above)



Changing the drive motor

- 1 Belt tensioner
- 2 Motor cable
- 3 Step motor
- 4 Motor controller
- 5 Fixing screws
- 6 Timing belt
- 7 Gear
- 8 Wedge



# 6.4.7 Ligth tube / Sender board replacement

Adapter / applicator

Replacing the light tube / transmitter board

If the fiber optic cable of the label sensor can no longer be cleaned or is damaged or dull, it must be replaced

If the sender board of the label sensor is no longer functional (check with digital camera or IR measuring device), it must be replaced.

#### **Procedure:**

- Unscrew the lower cover plate from the label transmitter housing.
- Replace the light tube (1) or transmitter board (2).
- When replacing the transmitter board, insure that the cable socket is inserted correctly on the board header pins. The brown (3) wire (15V DC cable) belongs to the + symbol (back); green wire close to the LEDs (front)
- Reassemble in the reverse sequence.



- **1** Ligth tube (flat) #5218...
- 2 Transmitter board #52180206
- 3 Brown wire
- 4 Cable shielding



# 6.4.8 Adjusting the rewinder pendulum (RW active + passive)

Rewinder unit (active and passive)

Adjusting the pendulum spring tension

Set the spring tension so that the retraction force is no stronger than needed for the pendulum to return to its zero position (to the upper stop = paper tear position). To set this spring tension, the back wall of the dispenser must be removed (see warnings for working with the housing open).

Slightly loosen the spring fixing screw (1) and slide it in the guide rail to achieve the desired spring tension. After this, firmly tighten the fixing screw again.

The picture shows a left unit – stronger spring force = move screw (1) to the right. Fasten fixing screw.



Picture of a left unit (L)

1 Fixing screw for setting spring tension



# 6.4.9 Setting the belt tension (RW passive)

Passive rewinder

Adjusting the belt tension

If the carrier paper is not rolled up cleanly by the rewinder, the timing belt may need to be adjusted.

Procedure:

- Remove the housing cover on the back.
- The belt tension of the labeler is set with a belt tensioner (1) at the timing belt (2).
- Loosen the fixing screw (3) on the belt tensioner slightly using a torx screwdriver.
- Use a large flathead screwdriver to turn the belt tensioner until the required belt tension is reached.
- Hold the flathead screwdriver in this position. With your other hand, tighten the fixing screw with the torx screwdriver firmly.
- If the belt tension is too low/high, the timing belt will not be driven correctly - motor /clutch can be blocked!
- Examination: apply a force (F) of about 8N to the timing belt (above the belt tensioner - see white double arrow). The timing belt should move down approx. 10mm (1kg ~ 9.8N).

A correct adjusted belt tension results in a smooth (soft) motion sound of the motion components!



Picture of a right unit (R)

Adjusting the timimng belt

- Belt tensioner 1
- Torx screw
- 2 Timing belt
- 3
- 4 Adjustment slot
- 5 Adjusting force (F)





# 6.4.10 Changing the timing belt (RW passive)

Passive rewinder

Replacing the timing belt

If the timing belt is damaged, it must be replaced.

#### Procedure:

- Remove the housing cover on the back. For this, remove the six screws.
- Loosen the belt tensioner (1)
- Remove the timing belt (2)
- Install the new timing belt in the reverse sequence performed for removal.
- Set the belt tension (see above)



#### Replacing the timing belt

- 1 Belt tenioner
- 2 Timing belt
- **3** Friction clutch
- 4 Adjustment slot



# 6.4.11 Adjusting the friction clutch (RW passive)

Passive rewinder

Adjusting the friction clutch

If the drive for the passive rewinder is not functioning properly, the friction clutch settings must be checked first (see corresponding chapter later in the manual). If the friction clutch can no longer be adjusted, the clutch pads must be changed.

#### Procedure:

- Remove the housing cover on the back.
- Adjust the pressure of the friction cluch with adjusting screw (4).....



Adjusting the clutch

Timing belt

2

- 1 Timing belt tensioner
- 3 Friction clutch
- 4 Adjusting screw



# 6.4.12 Reconditioning the clutch disks (RW passive)

Passive rewinder

Replacing the clutch disks

If the drive for the passive rewinder is not functioning properly, the friction clutch settings must be checked first (see corresponding chapter later in the manual). If the friction clutch can no longer be adjusted, the clutch pads must be changed.

#### Procedure:

- Remove the housing cover on the back.
- Loosen the belt tensioner (1)
- Remove the timing belt (2) from the friction clutch (3)
- Loosen the adjusting screw (4)
- Remove the splint (5)
- Friction clutch discs (6) remove the alu- and cork disks and the pulley from the clutch axis.
- Clean the alu disks
- Replace the cork disks
- Assemply steps in reverse order of disassembly steps.
- Set the belt tension (see above)



Fig. Replacing the clutch disks

- 1 Timing belt tensioner
- 4 Adjusting screw5 Splint
- 2 Timing belt3 Friction clutch
- 6 Friction clutch

84



# 6.4.13 Setting the belt tension (RW active)

**Optional Electric rewinder** 

Setting the belt tension

If the carrier paper is not cleanly rolled up by the optional electrical rewinder, the belt tension must be checked and adjusted if necessary.

#### Procedure:

- See Setting the belt tension (traction)
- In the rewinder traction unit, a one-way bearing is used that prevents the paper from running backwards.



Fig. Setting the belt tension

- Belt tensioner
   Drive belt
- 3 Tensioning screw

6.4.14 Changing the drive belt (RW active)

Optional electric rewinder	If the drive belt is damaged, it must be replaced.	
	Procedure:	
Replacing the timing belt	Procedure is identical to "Changing the rewinder motor", see below	



## 6.4.15 Changing the rewinder board (RW active)

#### **Optional electric rewinder**

Replacing the rewinder board

Replace the defective rewinder board HMC0607-x:

- Remove all plugs from the board
- Remove the 2 fixing screws (front plate)
- Remove the 4 fixing screws (board)
- Remove the 6 fixing screws from the aluminum rear wall the component to the far right has 2 washers

Assembly material:

- 6 M3x8 screws (NS008 026 Z)
- 4 M3x6 screws (NS008 001 Z)
- 2 M3 washers (NS290 001 Z)
- 1 aluminum assembly bracket (74015944)

Microcontroller:

1 dsPIC30F2010 microcontroller

Replacement board:

1 rewinder board HMC0607-x (52180308)



Installation:

Tightly screw the rewinder unit back onto the front plate. Use thermal paste here at the contact surface (see above).



# 6.4.16 Replacing Rewinder-Sensor-Board ersetzen (RW activ)

**Optional electrical rewinder** 

Replacing defective Rewinder-Sensor-Board HMC0608-x:

**Replace Rewinder-Sensor-Board** 

- remove rewinder dancer flag
- remove the two fixing screws (board to front plate)
- remove the sensor cable (from the board)

Replacement board:

1 Rewinder-Sensor-Board HMC0608-x (#52180408) whereas: x = version HMC0608-X (old)





replacement-board



mounting: dancer flag in position paper break unit: "**R**"ight version

Mounting the replacement rewinder sensor board:

- Plug in the sensor cable
- Fix the board to the front plate (2 screws)

"R"ight version unit:

Fix the rewinder dancer flag (1 screw)

the three sensors on the right hand side of the board have to be covered by the rewinder sensor flag! (on a "R"ight version unit) – see picture above.

"L"eft version unit:

Fix the rewinder dancer flag (1 screw)

the three sensors on the left hand side of the board have to be covered by the rewinder sensor flag! (on a "L"eft version unit)



# 6.4.17 Changing the rewinder motor (RW active)

**Optional electric rewinder** 

**Replacing the DC motor** 

If the drive motor of the **optional** electric rewinder is damaged, it must be replaced.

#### **Procedure:**

- Remove the housing cover on the back. For this, remove the six screws.
- Loosen the belt tensioner (1)
- Detach the red and black motor cable from the power plug J4 of the motor controller.
- Remove the three fixing screws (5) at the DC motor flange.
- Remove the DC motor with the timing belt.
- Remove the two screws from the bearing support block.
- Remove the bearing support block
- Pull the gear (7) off the motor axis.
- Push the gear onto the motor axis (new motor)
- Distance from gear (upper guide disk) to motor: 17.5 mm, then insert timing belt.
- Press the bearing support block onto the motor axis (up to the stop), then fix it with two screws.
- Clean the motor support block and the motor flange plate, then re-apply thermal paste
- The remaining steps are performed in reverse order from disassembly.
- Set the belt tension (see above)



- 1 Interface
- 2 Connection cable
- 3 Fixing screw
- 4 Fixing screw
- 5 Protective hood



# 6.4.18 Replacing the mainboard (HMC0601)

Replacing the control unit (mainboard)

Replace the defective control unit (slave controller):

- Disconnect all plug connections
- Unscrew the transformer cable (2 red cables / 2 blue cables)
- Remove the 4 fixing screws (board)
- Remove the main control unit



# 6.4.19 Replacing the master controller (RCM4010)

Replacing the master controller (RCM4010)

Replace the defective main control unit (master controller):

- Unscrew the fixing screw Torx 10
- Remove the main control unit





# 6.4.20 Firmware Update – Master-Controller (RCM4010)

Programming the Master-Controller of the main control unit (Mainboard)

#### Installing programming software:

Install the programming firmware Dynamic C (V 10.66) to your PC/Laptop. Default directory: C:\Programme\DCRABBIT\_10.66\

The "Flash Image" file will be generated by Collamat AG (with the Dynamic C Software: Compile Project to .bin File =

MAIN-V1-02.BIN = Version: V 1.02 (FDT3 Data File)

#### **Programming cable:**

- Rabbit Programming cable (serial) from Reselec AG U.Art.Nr. 30010012 (1.27m)
   Digi International Inc. Part Number 20-01-0542 (use "PROG" – connector)
- US232B-100-BST-cable (Blister 100cm cable) from Reselec AG U.Art.Nr. 24010001 (1.00m) incl.. EasySYNC driver software (optional use of this cable, if no serial port is available on your computer – load EasySYNC-driver first).

#### Programming (RCM4010):

Use the RFU-program from Digi International Inc. (part of the Dynamic C Installation – see above) to program the Mastercontroller. RFU = Rabbit Field Utility Version 4.62

#### Settings:

- Firmware Setup: Firmware Image: LW:\.....\MAIN-V1-02.BIN
- Processor Type: Rabbit 4000+
- Setup: Communication:- Baud Rates: Debug Baud Rates: 115200
  - Max.Download Baud Rate: 230400
    - Stop Bits: 1
    - Enable Processor verification
    - Use USB to Serial Converter (optional)
- File Location:
- if the programming software Dynamic C has not been installed in the default-directory, you have to edit the path entries accordingly!
- Select port: e.g. for serial communication: COM1 e.g. for USB to RS232 communication: COM4(USB)

Plug in programming cable: "PROG"- plug to J1 of RCM4010 (red cable -> top left)

#### Load firmware image to RCM4010:

- Start: sending cold loader
  - sending Pilot BIOS
  - erasing flash
  - programming
  - observe the "Progress Bar"
- Finish! Switch off Collamat NG remove programming cable. Check firmware version on RCM4010 - see 6.4.21



# 6.4.21 Firmware Update - Slave-Controller (dsPIC)

Programming the Slave-Controller of the main control unit (Main board)

(conventional with MPLAB ICD2 or ICD3)

- Programming device:
  - MPLAB ICD2 or ICD3 (USB)

#### Programming software:

 MPLAB DIE v8.76 or newer - Installation in default path (C:\Programme\Microchip\MPLAB DIE\....)

#### Check actual version:

- Power on Collamat
- Service Version: RCM Y.YY PIC X.XX (e.g. RCM 1.02 PIC 1.41) or observe display message after power on.

#### Create HEX-file (done by Collamat AG):

- Configure Configuration Bits:
  - set  $\boxed{\checkmark}$ : Configuration Bits set in code



Project with Boot loader (ds30loader.s)

#### **Build HEX-file:**

- Project Build All:
  - .... wait for message: BUILD SUCCEEDED
  - HEX-file has been stored as: NG PIC.HEX
- Collamat AG will provide this HEX-file for downloading. Name: NG PIC V-VV-BL.HEX – whereas
   V-VV indicates the corresponding version number and BL the boot loader version
   e.g. ." NG PIC-1-41-mBL.HEX"



#### Prepare programming:

- Switch OFF Collamat NG unit.
- Connect MPLAB ICD2 (ICD3) to Computer (USB/COM)
- Start MPLAB IDE
- File Import: path open NG PIC V-VV-BL.HEX
- Connect MPLAB ICD2 (ICD3) cable to main board (5-pin pin header J2 on main board)
- Programmer Select Programmer: MPLAB ICD2 (ICD3)
- Programmer Connect:
  - Connecting to MPLAB ICD 2 ...Connected Setting Vdd source to MPLAB ICD 2 Target Device dsPIC33FJ12MC202 found, revision = Rev 0x3002 ...Reading ICD Product ID Running ICD Self Test ...Passed MPLAB ICD 2 ready for next operation

#### **Programming:**

- Programmer Program:
  - Programming Target...
  - ...Validating configuration fields
  - ...Erasing Part
  - ...Programming Program Memory (0x0 0x14FF)
  - Verifying...
  - ... Program Memory
  - ...Verify Succeeded
  - ... Programming Configuration Bits
  - .. Config Memory
  - Verifying configuration memory...
  - ...Programming succeeded
  - 08-Nov-2010, 10:36:29
  - MPLAB ICD 2 ready for next operation
- Power OFF Collamat NG
- Remove programming device

#### Check version number:

- Power ON Collamat NG
- Service Version: RCM Y.YY PIC X.XX (e.g. RCM 1.02 PIC 1.41)



Programming the slave controller of the main control unit (Main board) (Boot loader version) This programming version requires a working boot loader in the slave controller (dsPIC).

(Part of the first time programming und testing at the board supplier).

#### Creating a new HEX-file (without boot loader) (by Collamat AG):

Configure – Configuration Bits:

set  $\sqrt{}$ : Configuration Bits set in code



Project without Boot loader (ds30loader.s)

- Project Build All:
  - .... wait for message: BUILD SUCCEEDED
- HEX-file has been stored as: NG PIC.HEX
- Collamat AG will provide this HEX-file for downloading. Name: NG PIC V-VV.HEX – whereas
   V-VV indicates the corresponding version number
   e.g. ." NG PIC-1-41-oBL.HEX" (oBL = without BootLoader)

#### Programming cable:

9-pin D-Sub 1:1 cable with 1x 9-pin D-sub (female) - and 1x 9-pin D-Sub (male) – connector/plug.

#### **Option:**

US232B-100-BST-cable (Blister 100cm cable) from Reselec AG U.Art:Nr. 24010001 (1.00m) including EasySYNC driver software (optional use of this cable (together with the above D-Sub cable) if no serial port is available on your computer

- load EasySYNC-driver first).



#### Plug in programming cable:

Computer with serial port (COM-Port):

Plug in D-Sub-cable to COM-port of your PC and to RS232-port of the Collamat NG unit.

Computer without serial port:

Plug in US232B-100-BST-cable to USB-Port of your PC. Connect other end with D-Sub 1:1 cable. Connect other end of Dsub 1:1 cable to RS232-port of the Collamat NG unit.

#### Programming software (ds30 Loader GUI.exe):

🛃 ds 30 Loa	der			
Eile Option	ns <u>C</u> ommands bl 🖸 Download	View	Help ort Output	
Basic Adv	anced Timing	Reset	Activation Terminal	
Hex-file:	C:\Data\Projekt	er\NG\	IG PIC/NG PIC.hex	
Device:	dsPIC33FJ 🐱	12M	202	
Baud rate:	9600 🗸	Port	COM1	
Write	program Eeprom		<u> </u>	
Parsing hex-fi File timest Validating Hex-file st 2638 prog 0 Eeprom 0 config v	le amp: 25-10-2010 hex-fileok uccessfully parsed gram words found words found words found	21:38:0 in 43 ro	vs	
Copyright © 08	-10, Mikael Gusta	fsson		GPL Licensed 1.3.11

The dsLoader software is used to program the dsPIC (slave controller) of the main board (via boot loader). The boot loader itself has been loaded to the dsPIC during main board production/test (version RCM 0.88 PIC 1.29 – or newer)

#### **Programming:**

Power OFF Collamat NG. Start prog-software ds 30 Loader GUI.exe, load HEX-file: NG PIC V-VV.HEX, device: dsPIC33FJ – 12MC202, baud rate: 9600, enable write program,

Port: serial port (for example COM1) or USB-port (COM4(USB)). Power ON Collamat unit and – press the <u>Download</u> button within the next 5 second. Wait for the message "Download finished" (see below).

Initiating download... Searching for bl . Found dsPIC33FJ12MC202 fw ver. 1.1.0 Waiting for bootloader to be ready...ok Writing flash...ok Download finished Tx 10.9kB / Rx 67 bytes / 13.5s

The dsPIC will now restart with the new loaded firmware. **Finish!** Switch OFF the Collamat NG unit – remove programming cable.

See chapter 6.4.21 (bottom) or 3.2.3 firmware versions

**Firmware Versions** 



# 6.4.22 Details to Menu - Service - Read PIC reg 0-63

Read PIC reg 0-63	You will find the Collama	the co t NG \$	omplete menu struc Series – from chap	ture in the corr ter 7.8	esponding Operator Manual of		
	Service - Read PIC reg 0-63: read the most important dsPIC-register (Register 0 63):						
	Register 01: Register 02:	REG_ REG_ B2: N	MaxStepFreq Regi Status1 Registers[ 10TOR ERROR	isters[1] 2] (PIC Status	Bits)		
	writing	B1: WALL FOR COMMAND (set by PIC initialization – cleared by writing to Control1 register – PIC function is blocked until this bit is reset)					
	Register 03:	B0: F REG_ B8: I	APER OUT Status2 Registers[	3] (Motor cont	roller)		
	Register 04:	B7-B REG_	0: State _UsageCountL Reg	isters[4]	be in Statusz Tegister)		
	Register 05: Register 06:	REG_ REG_ #defin	UsageCountH Reg Control1 Registers	jisters[5] [6] =G_Control1 &	1) !=0)		
	#define REG_StartEdge ((REG_Control1 & 2) !=0) #define REG_StartEdge ((REG_Control1 & 2) !=0)						
	#define REG_MotorDir ((REG_Control1 & 4) !=0) B2: Motor direction #define REG_RunContinious ((REG_Control1 & 8) B3: Run signal, 0=active for each label, 1=active for						
	#define REG_Calibrate ((REG_Control1 & 16) !=0) B4: Skip forward with Start speed (measure label or LSC) #define REG_MeasureLabelLen ((REG_Control1 & 32) B5: Skip forward with Start speed until 2 gaps						
	:	#defir	e REG_Feed ((RE) B6: Feed label	G_Control1 & 6	64) !=0)		
	Register 07: Register 08: Register 09:	REG_ REG_	Control2 Registers Mode Registers[8]	[7]			
	Register 10: Register 11: Register 12:	REG_ REG_ REG	_MotorStartSpeed F _MotorReqSpeed R _MotorStonSpeed F	Registers[10] egisters[11] Registers[12]			
	Register 13: Register 14:	REG_	MotorOccel Regist	ers[13] jisters[14]			
	Register 15: Register 16:	REG_	_MotorFeedSpeed F		// Feed speed		
	Register 17: Register 18:	REG_	_StepLen Registers _TACHOLen Regist Example: 1638 = 0	[   / ] ers[18] .025mm	// 1/65536mm		
	Register 19:	REG_	MotorMaxSpeed R Example: 23423 =	egisters[19] 36.00m/min	// max.Tacho // speed		



//

Read PIC reg 0-63	Register 20: REG	_StartDelay Registers[20] Start (position) delay [1/16mm]	// 1/16mm				
continuation	Register 21: REG	_Predispense Registers[21]	// steps				
	Register 22: REG	Predispense2 Registers[22] Delayed predispense for corner	delect				
	labelling, relative t	o Predispense					
	Register 23: REG	LabelLength Registers[23] Max.label length (including gap)	// steps				
	Register 24: REG	_GSCIgnore Registers[24]	// 1/16mm				
	Register 25: REG	PreDispDelay Registers[25]	// 1/16mm				
	Register 26: REG	_MissLabelAccept Registers[26]	(0-2)				
	Register 27: REG	_PreDispSpeed Registers[27]	(02)				
	falling edge. 0-follow product speed						
	Register 28:						
	Register 29:						
	Register 30: REG	LSCControl Registers[30]					
		#define REG_LSCAuxInput ((REG	LSCControl & 1) != 0)				
		B0: Select aux LSC input	_ , ,				
	Register 31: REG_LSCStopCriteria Registers[31]						
	Register 32: REG_LSCThreshold Registers[32]						
	Register 33: REG_LSCCurrentLevel Registers[33]						
	Register 34: REG_LSCMinLevel Registers[34]						
	Register 35: REG_LSCMaxLevelRegisters[35]						
	Register 36: REG_TACHOCountsPerStep Registers[36]						
	// Lacho counts per step. 10 fractional bits						
	Register 37: REG_IAUHUFactor Registers[37]						
	// Conversion factor from encoder pulses						
	// to speed value.	10 fractional bits					
	Register 38: REG	_IACHOSpeed Registers[38]					
	Pagiator 20: DEC	7  example  23423 = 36.00m/min					
	Keyister 39: KEG_I ACHOCOUNT Keyisters[39]						
	// counts up for each phase A/B edge						
	Register 41: REG	Ignorel SC Registers[41]					
	Register 42: REG	Debug1 Registers[42]	// for test only				
	Register 43: REG	Debug2 Registers[43]	// for test only				
	Register 44: REG	Debug3 Registers[44]	// for test only				
	Register 45: REG	MotorAccelSteps Registers[45]	// for test only				
	Register 46: REG	MotorDeAccelSteps Registers[46]	// for test only				
	Register 47: REG	_MotorTotalSteps Registers[47]	rth				
	Register 48: REG	MotorPreDispSteps Registers[48]	// for test only				
	Register 49: REG		· · · · · · · · · · · · · · · · · · ·				
	must be 1 for enco	der in usel					
	Register 50: RFG	MultiLabels Registers[50]					
	//	Multiple Mode: number of labels (1-	4)				



Read PIC reg 0-63	Register 51: REG_MultiReserved Registers[51] // Multiple Mode: reserved	
continuation	Register 52: REG_MultDist0 Registers[52]	// 1/16mm
	Register 53: REG_MultDist1 Registers[53] // Multiple Mode:	euges
	Register 54: REG_MultiDist2 Registers[54] // Multiple Mode:	
	Register 55:	
	Register 56:	
	Register 57:	
	Register 58:	
	Register 59:	
	Register 60: REG_Free1Registers[60] // free	
	Register 61: REG_Free2 Registers[61] // free	
	Register 62: REG_Free3 Registers[62] // free	
	Register 63: REG_Free4 Registers[63] // current start correction + tacho speed // in number of encoder pulses	// test compensation

# 6.4.23 Details to Menu - Service - Inputs

Inputs	Use this function for technical inspections or for main works to check/read the inputs of the dsPIC – register	enance r wise:
	<ul> <li>(ext.) Register CS0: Piggy-Board [AVA / X-V B0: H, B1-B7: L = AVA: 1 B0-B1: H, B2-B7: L = X-WEB: 3</li> </ul>	VEB]
	<ul> <li>(ext.) Register CS2: internal I/O-Block</li> <li>B0: TUNIT</li> <li>Traction unit of B1: LLO</li> <li>Label low inp</li> <li>B2: RWF</li> <li>Rewinder full</li> <li>B3: OOL</li> <li>Out of label ir</li> <li>B4: PRODUCT_INX</li> <li>Product input</li> <li>B5: NSTP_INX</li> <li>Nonstop inpu</li> <li>B6: RWE_ERROR_INX</li> <li>Feed key input</li> </ul>	open input ut input iput (AUX_INX) t or input ut
	<ul> <li>(ext.) Register CS4: Piggy-Board [AVA or X B0: DOWN1 or CW1-INPOS(P2- B1: HOME1 or CW2-INPOS(P2- B2: DOWN2 or CW3-INPOS(P1- B3: HOME2 or CW1-ERROR(P2 B4: DOWN3 or CW2-ERROR(P2 B5: HOME3 or CW3-ERROR(P2 B6: LAPR or FREF1(P2-18) B7: RES_IN</li> </ul>	-WEB] 12) 13) 14) 2-15) -16) 2-17)
	<ul> <li>(ext.) Register CS6: external / Applicator I/C</li> <li>B0: START - START input</li> <li>B1: STOP - STOP input</li> <li>B2: COUNTER_INX - Printer error (</li> <li>B3: READY - READY input</li> <li>B4: ERRIN - ERROR input</li> <li>B5: LOCK - LOCK input</li> <li>B6: H - always H</li> <li>B7: H - always H</li> </ul>	-Block PRTERR_X)
	<ul> <li>(int.) Register PB: internal Register</li> <li>PB0: START2 - to dsPIC (RB2)</li> <li>PB1: PIC_ERR - from dsPIC (RB2)</li> <li>PB2: CS_A0 - to U3 (74VHC)</li> <li>PB3: CS_A1 - to U3 (74VHC)</li> <li>PB4: CS_A2 - to U3 (74VHC)</li> <li>PB5-PB7: open - N.U.</li> </ul>	2) 138) 138) 138) 138)
	<ul> <li>(int.) Register PC: internal Register</li> <li>PC0: TXD - to operator pa</li> <li>PC1: RXD - from operator</li> <li>PC2: TXC - to PIGGYPAC</li> <li>PC3: RXC - from PIGGYPA</li> <li>PC4: TXB - to dsPIC (RB5</li> <li>PC5: RXB - from dsPIC (R</li> <li>PC6-PC7: open</li> </ul>	nel panel K ACK i) B6)
	continuation on next page	

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Inputs (...) continuation

(int.) Register PE: internal Register PE0: GSC - Goodscanner input PE1: RUN - from dsPIC (RB3) PE2: TXF - to RS232 PE3: RXF - from RS232 PE4: open - N.U. PE5: open - SMODE0 - N.U. PE6: open - SMODE1 - N.U. PE7: open - STATUS - N.U.

- for internal use only!

# 6.4.24 Details to Menu - Service - Read Outputs

Use this function for technical inspections or for maintenance works to **check/read** the outputs of the dsPIC – register wise:

■ (ext.) Register CS1: N.U.

(ext.) Register	CS3: Pigg	y-Boar	d [AVA or X-WEB]
B0: BLOW	(P2-3)	or	CW1-START(P2-3)
B1: VALVE1	(P2-4)	or	CW2-START(P2-4)
B2: VACU	(P2-5)	or	CW3-START(P2-5)
B3: BLTB	(P2-6)	or	BLTB(P2-6)
B4: A_FEED	(P2-10/11)	or	RUN(P2-7)
B5: VALVE2	(P2-7)		
B6: VALVE3	(P2-8)		
B7: A_FLAP	(P2-9)		

(ext.) Register CS5:	external / applicator I/O	-Block
B0: ERR	- Error	
B1: WAR	- Warning	
B2: RUN	- Run	
B3: PRODUCT_OUT	F - Product (Nonstop)	(PRINT)
B4: FEED	- forward feed	
B5: ADA_HOME	- Adapter in Home-Pos	sition
B6: N.U.	- not used	
B7: FLAP	- Magnet flap adapter	
(ext.) Register CS7:	- el. rewinder / Nonstop	I/O-Block
B0: RW-ENABLE	- el. rewinder on/off (1/0	))
B1: NSTP_OUT	- Nonstop output on/off	(1/0)
B2: RW_WIDTH	- el. rewinder (small=0, v	wide=1)

■ (int.) Register PB - B0: START2 to dsPIC

- for internal use only!



# 6.4.25 Details to Menu - Service - Set Outputs

Set outputs	Use this to <mark>set/w</mark>	s function for technical inspections or for maintenance works write the outputs of the dsPIC – register wise:		
		(ext.) Register CS1: N.U.		
		(ext.) Register CS3: Piggy-Board [AVA or X-WEB]         B0: BLOW       (P2-3)       or       CW1-START       (P2-3)         B1: VALVE1       (P2-4)       or       CW2-START       (P2-4)         B2: VACU       (P2-5)       or       CW3-START       (P2-5)         B3: BLTB       (P2-6)       or       BLTB       (P2-6)         B4: VALVE2       (P2-7)       or       RUN       (P2-7)         B5: VALVE3       (P2-8)       B6: FLAP       (P2-9)         B7: RES-OUT (P2-10)       V       V       V		
<ul> <li>(ext.) Register CS5: e B0: ERR</li> <li>B1: WAR</li> <li>B2: RUN</li> <li>B3: PRODUCT_OUT</li> <li>B4: FEED</li> <li>B5: ADA_HOME</li> <li>B6: N.U.</li> <li>B7: FLAP</li> </ul>		(ext.) Register CS5: external / Applicator I/O-BlockB0: ERR- ErrorB1: WAR- WarningB2: RUN- RunB3: PRODUCT_OUT- Product out (Nonstop) (PRINT)B4: FEED- forward feedB5: ADA_HOME- Adapter in Home-PositionB6: N.U not usedB7: FLAP- Magnet flap adapter		
		(ext.) Register CS7:- el. rewinder / Nonstop I/O-BlockB0: RW-ENABLE- el. rewinder on/off (1/0)B1: NSTP_OUT- nonstop output on/off (1/0)B2: RW_WIDTH- el. rewinder (small=0, wide=1)		
		(int.) Register PB - B0: START2 to dsPIC		
	- for inte	ernal use only!		
6.4.26 Directions to naming	of inpu	ts/outputs		
Naming	Schema	atic version 3.4:		
	The sch Actual v The foll	nematic of the Collamat NG unit has been updated. version: 3.4 owing inputs/outputs have been renamed:		

Name inconsistencies:

Old:	AUX_INX	New:	PRODUCT_INX
	PRTERR_X		COUNTER_INX
	PRINT_X		COUNTER_OUT

This documentation will use the new naming ONLY!



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# Index of documents in the Appendix



# 8 Index of documents in the Appendix

Index	Description	Art. No.
А	CE - Conformity Declaration	
В	CE - Declaration of Incorporation	
С	RoHS - Conformity Declaration	
D	UL- / CSA - Conformity	
Е	Lifting of loads	
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G	Wiring block diagram	
Н.	Boards and cables	
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J	Jumper Setting (side plate "SIGNALS"	





# Register A CE Declaration of Conformity

The manufacturer:

Collamat AG Bodenmattstrasse 34 CH-4153 Reinach – Switzerland

declares that the product:

Series:	Collamat-NG 50 and NG 100	
Serial numbers:	NG 50: from 0036 to	
	NG 100: from 1003 to	
Year of manufacture:	from 2011 to	

relates to all basic requirements of the below-mentioned directives (including there changes and extensions):

2006/42/EG - directive on machinery 2004/108/EG - electromagnetic compatibility (EMC)

Authorized person to compile the complete technical documentation for this unit according to appendix VII - chapter A of the machinery directive 2006/42/EG is:

#### Collamat AG, Paul Schneider, Bodenmattstrasse 34, CH-4153 Reinach, Switzerland

Applied harmonized standards, in particular are:

- EN ISO 60204-1	Safety of Machinery - Electrical Equipment of Machines –
	Part 1: General Requirements-IEC 60204-1: 1997;
- EN ISO 12100-1	Safety of machinery Basic concepts, general principles for design -
	Part 1: Basic terminology, methodology
- EN ISO 12100-2	Safety of machinery Basic concepts, general principles for design -
	Part 2: Technical principles
- EN ISO 141121-1	Safety of machinery, Risk assessment. Principles.

Remark: The CE-Declaration of Conformity is valid only – if the Collamat NG is safely mounted on a (Collamat AG) approved rack/stand.

then 1 p

Issued in Reinach: 01. September 2011

by:

Collamat AG – Bodenmattstrasse 34, CH-4153 Reinach, Switzerland

Authorised person: CEO - Frank Ankersen



# **Register B** CE – Declaration of incorporation

The manufacturer:

HM Collamat AG Bodenmattstrasse 34 CH-4153 Reinach – Switzerland

declares, that the machinery / machinery component named below as:

Series:	Collamat NG 50 and NG 100	
Serial number:	NG 50: from 0036 to	
	NG 100: from 1003 to	
Year of manufacture:	from 2011 to	

is intended to be assembled with other machinery / machinery components to constitute machinery , witch shall not be put into service until the assembled machinery has been declared in conformity with the provisions of the EC Council Directive on Machinery 2006/42/EG (including there changes and extensions): Appendix I: article: 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4 and 1.5.1.

The above mentioned machinery relates furthermore to the regulations and directives of: 2006/95/EG (low voltage directive) and 2004/108/EG (electromagnetic compatibility directive - EMC).

Applied harmonized standards, in particular are:

EN ISO 12100-1	Safety of machinery Basic concepts, general principles for design Part 1: Basic terminology, methodology
EN ISO 12100-2	Safety of machinery Basic concepts, general principles for design Part 2: Technical principles
EN ISO 60204-1	Safety of Machinery - Electrical Equipment of Machines Part 1: General Requirements-IEC 60204-1: 1997;
EN ISO14121-1	Safety of machinery. Risk assessment. Principles

A technical documentation set of this piece of machinery is available on demand - in electronic form (for governmental use only). The corresponding documentation to this piece of machinery has been issued according to appendix VII part B.

Responsible person for the composition of all technical documents according to Appendix VII – chapter B of the Directive on Machinery 2006/42/EG is:

Collamat AG, Paul Schneider, Bodenmattstrasse 34, CH-4153 Reinach, Switzerland

the the

Issued in Reinach: 01. September 2011

by:



## Collamat AG – Bodenmattstrasse 34, CH-4153 Reinach, Switzerland

Authorized person: CEO - Frank Ankersen

# **Register C**

**RoHS - Conformity Declaration** 







# **RoHS - Conformity Declaration**

The EU Directive 2002/95/EC regarding limitation of use of certain dangerous substances in electric and electronic devices prohibits the use of the substances below.

It was determined that the conformity of components is important for many customers, although there is no general legal ban on the contents of the components.

#### **Definition of RoHS conformity:**

RoHS conformity means that the product does not contain any of the prohibited substances above the limit levels, as described by the directive and (for components) the product may be processed at higher temperatures as required for a lead-free soldering process.

The prohibited substances and the maximum allowed limit levels per homogeneous substance are:

Substance	Limit level
Lead	0.1%
Mercury	0.1%
Chrome VI	0.1%
Polybromated biphenyl (PBB)	0.1%
Polybromated diphenylether (PBDE)	0.1%
Cadmium	0.01%

All suppliers for this product/device (see product details below) have confirmed that their components/component groups are in conformity with RoHS.

Collamat AG has taken all necessary steps to ensure the accuracy of this statement. The declaration is only binding for products that are purchased on or after the creation date.

## **Product details**

Order number:	XXXXXXXXX
Description/Manufacturer/Brand	:Label Dispenser / Collamat AG / Collamat NG
Manufacturer description: direction	Collamat-NG-WWW-R-D, in which: $W = width$ , $R = rewinder$ , $D =$

Date:

Reinach, 10 April 2009

# Collamat AG - Bodenmattstrasse 34, CH-4153 Reinach, Switzerland

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# **Register D**

**UL-CSA - Conformity** 

Manufacturer:

Collamat AG Bodenmattstrasse 34 CH 4153 Reinach Switzerland

#### **General:**

The Collamat NG labeling device, created by Collamat AG, has been developed and built according to the latest EU standards / directives. This has been confirmed in the corresponding CE Declaration / Declaration of Conformity (also available as an Appendix to this document) for this device series. During the development phase of this product line, all components / component groups were checked for UL/CSA conformity. Most components conform to both CE as well as UL/CSA. For the markets demanding UL/CSA conformity, alternative parts are available (this only applies to the components having NOT combined conformity = CE and UL/CSA).

#### **Cables/Wires:**

UL-conforming cables/wires are not easily available in Europe, particularly when a precisely defined outside diameter and corresponding cable elasticity are required (see label sensor).

The cables/wires used on the Collamat NG are in CE-conforming. For the markets that demand UL/CSA conformity, alternative cable sets are available (this only applies to the components that do not have combined conformity = CE and UL/CSA).

We will compile a cable/wire set that is in conformity with both CE and UL/CSA = combined conformity – in the next revision.

#### PCBs:

The board material for all Collamat NG printed circuit boards (PCBs) conform with fire protection category <u>UL 94 / V0</u> (category QMZS2)

The production and mounting process of the PCBs is performed in a UL accredited production process (ZPMV2)

UL94 = "Tests for Flammability of Plastic Materials for Parts in Devices and Applications"

Equal to IEC/DIN EN 60695-11-10 and -20 and equal to CSA C 22.2 are maintained.

Our PCB manufacturers and assembly suppliers have confirmed that the products delivered to Collamat AG meet the directives and regulations above.

#### What/How:

The status of this analysis/testing is continuously updated in the internal document "Electronics - Parts List" for the Collamat NG. For devices for UL/CSA markets, the EU Directive 2002/95/EC and RoHS conformity are also valid.

# Collamat AG - Bodenmattstrasse 34, CH-4153 Reinach, Switzerland

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# **Register E**

# Lifting of loads

Heavy lifting and/or heavy labor are relative terms, as individual capabilities are very different. Work that could be performed easily by a young, strong man may be unacceptable exertion for a weaker man, an older man, or for a woman or child.

The EC Directive 90/269/EWR and the Load Handling Regulation make clear statements regarding limit levels and frequencies for load handling (LASI Publication LV 9). The German Federal Ministry recommends that acceptable loads be based on age, lifting frequency and gender. For occasional lifting and carrying, women older than fifteen years of age may move loads of 15 kg; for frequent lifting and carrying, loads of 10 kg are acceptable (occasional = less than twice hourly, max. three or four steps; frequent = more than twice or three times hourly and more than four steps).

For pregnant or nursing female employees, the Mother Protection Laws are valid. In Par. 4 Sect. 1 and Sect. 2 of the Mother Protection Law, general work prohibitions are clarified, including lifting and carrying of loads. Pregnant or nursing female employees may not lift loads of more than 5 kg frequently or 10 kg occasionally by hand.

See also EC Directive 89/391/EWR.

#### Working with a label dispenser (Collamat NG):

The unwinder of the Collamat NG can accept label rolls that have the following maximum dimensions:

- Roll diameter: 400mm
- Roll width: 250mm

Depending on the type of paper and carrier material, a label roll with these maximum diameters may weigh up to 28 kg.

For this reason, label rolls that exceed a weight of 15 kg must be moved with a lifting system onto the unwinder unit or .....

..... an alternative assembly of the unwinder unit must be selected, such as in which the label rolls can be loaded onto the unwinder unit near the ground with a forklift. For this, a paper guide unit is generally needed, which moves the label paper from the unwinder unit (near the ground) to the label dispenser Collamat NG (generally at working height / conveyor belt height).

If label rolls of more than 15 kg are loaded onto a standard Collamat NG, the unwinder unit must be supported with a stabilization set.

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# **Register F**

# **Error checklist**

Device type:	Ser.No. Dispenser:	Collamat NG S W P B	
	NIE	S = speed: 50, 100	S =
	NO	W = WIGIN: X, Y, Z P = Position: T S P   P W A	VV =
		P = POSITION. T, S, B, L, R, W, A B = Branch: P E C O	F = B -
Environment:	Supply voltage:	Supply frequency (Hz):	Temperature (C):
	Humidity %:	Degree of interference, EMC (burst):	Degree of interference, ESD (static):
Labels:	Width:	Length:	Distance:
	Thickness:	Transparency:	Material:
Carrier paper:	Width:	Thickness:	Transparency:
Goods:	Туре:	Material:	Shape:
_	Length:	Width:	Height:
	Speed m/min	Length in transport direction:	Distance:
Dispenser:	Speed m/min	Cadence pcs/min:	Measurement method:
Settings:	Pre-dispensing mm:	Position mm:	Suppression:
	Stop criteria:	Label length:	Suppression:
Special notes:			
Maahina anvironmanti	Coode transport:	Lipetreem mechine:	Downstroom machine:
Machine environment.	Goods transport.	opstream machine.	Downstream machine.
	Other surrounding machines:		
Peripheral devices:	1	2	3
Shielding:	Supply cables:	Sensor cables:	
ESD phenomenons:	Description:		
Description of interference:	Error frequency	constant: regular:	sec
Date + time of fault:		sporadic.	
Notes:			
Fault noted by:	Name:		
	Name.		
	Date:		


# **Register G**

**Collamat**<sup>®</sup>

### Wiring block diagram





# **Register H**

## Boards (PCB) and cables

#### Board numbers, Collamat NG (HMC06)

Name	Description		Version	Measures [mm]	Part- number		Drawing- number
HMC0601	Main-Board		3.4	306 x 106	52180266	S	152188007
HMC0602	Connector-Board		0.4 V	96 x 55	52180401	s	152180401
HMC0603	AVA-Connection-Board		A2	70 x 64	52180253	Ũ	152180253
HMC0604-1	Connection-Box-Board (U	MK-Module)	1C	72 x 110	52180404		152180404
HMC0604-2	Connection-Box-Board (Be	opla-Alu-Box)	2C	70 x 114	52180403		152180403
HMC0605	AVA-Adapter-Board	. ,	G	79 x 62	52180405	s	152180405
HMC0606	MFA-Adapter-Board		S	79 x 62	52180406		152180406
HMC0607	Rewinder-Board (old)		X1 / X2	110 x 100	52180308		152188565
HMC0607	Rewinder-Board (new)		А	110 x 100	52180308		152188565
HMC0608	Rewinder-Sensor-Board (old)		X / Y	60 x 30	52180408		152180408
HMC0608	Rewinder-Sensor-Board (new)		А	60 x 30	52180408		152180408
HMC0609	Operatorpanel-Board (SMD)		А	98 x 60	52180379	S	152188993
HMC0610	Forksensor-Board	N.U.	P2	27 x 20	52180410		152180410
HMC0611	LSC TCY IR-Sender-Board	1	I	79 x 16	52180206	S	152180206
HMC0614	AVA Driver Piggyback	pending	F	97 x 86	52180414		152180414
HMC0615	X-WEB Driver Piggyback	pending	G	97 x 86	52180415		152180415
RCM4010	Maincontroller Rabbit RCM	14010		60 x 47	74016122	S	

BOARDS						
DOANDO	CE-7 CSA- Conformity.					
	PCB material according to fire protection class UL 94 / V0 (category QMZS2) Produktion / assembly of PCB according to UL accredited production process (ZPMV2)					
	UL94 = "Tests for Flammability of Plastic Materials for Parts in Devices and Applications"					
	Identical to IEC/DIN EN 60695-11-10 and -20 and identical to CSA C 22.2					
CABLES	Cables according to:					
	Directive 2002/95/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL from January 27th. 2003					
	Restriction of the use of certain dangerous material in electrical and electronic equipment.					
	UL- / CSA- Conformity:					
	If ever possible - use UL- and CSA-approved cables and wires only ! Those parts using NOT UL- and CSA-					



#### Cablenumbers Collamat NG (HMC06)

Name	Description		I	Pins	Length	Part-	Stand.	Drawing-
					[mm]	number	S	number
				•	070	50400074	0	150100550
HMC06CA01D				3	370	52180271	S	152188558
HMC06CA02C	LLO sensorcable			3	450	52180421		152180421
HMC06CA03A	RWF sensorcable			3	250	52180422		152180422
HMC06CA04C	OOL sensorcable			1	310	52180423	S	152180423
HMC06CA05B	M8 socket (GSC)			4	115	52180424	S	152180424
HMC06CA06F-s	Operatorpanel cable short	(HMC06	601 to HMC0609)	5	400	52180425-0	00 S	152180425
HMC06CA06F-m	Operatorpanel cable midium	(HMC06	601 to HMC0609)	5	480	52180425-0	01 (S)	152180425
HMC06CA06F-I	Operatorpanel cable long	(HMC06	601 to HMC0609)	5	520	52180425-0	02 (S)	152180425
HMC06CA07E	Connectionplate cable	(HMC06	601 to HMC0602)	40	250	52180426	S	152180426
HMC06CA08D-s	Adapter cable	(HMC06	601 to HMC0605/06)	10	750	52180427	S	152180427
HMC06CA08D-I	Adapter cable	(HMC06	601 to HMC0605/06)	10	1000	52180428	(S)	152180428
HMC06CA09A	Motor cable	(KT - pa	art of motor)	4		74071800		152180429
HMC06CA10A	Ethernet patch cable	(KT)		5	300	52180430		152180430
HMC06CA11B	Electric rewinder control c.	(HMC06	601 to HMC0607)	6	220	52180431		152180431
HMC06CA12E	Motorcontroller controll cable	(HMC06	601 to NDC06)	7	120	52180432	S	152180432
HMC06CA13C	Motorcontroller power cable	(HMC06	601 to NDC06)	2	120	52180433	S	152180433
HMC06CA14H	PE - cable Power			1	130/140/165	52180434	S	152180434
HMC06CA15B-s	PE - cable Adapter-Housing t	o VZW -	(short)	1	500	52180435	S	152180435
HMC06CA15B-I	PE - cable Adapter-Housing t	o VZW ·	- (long)	1	750	52180436	(S)	152180436
HMC06CA16E	Transformer 340VA with conr	nectors	(KT - part of trafo)	-		74080466		152180437
HMC06CA17E	Transformer 460VA with conr	nectors	(KT - part of trafo)	-		74080477		152180438
HMC06CA18C	Electric rewinder sensor c.	(HMC06	607 to HMC0608)	10	220	52180439		152180439
HMC06CA18D	Electric rewinder sensor c.	(HMC06	, 607 to HMC0608)	10-8	200	52180439		152180439
HMC06CA18E	Electric rewinder sensor c.	(HMC06	, 607 to HMC0608)	8	200	52180439		152180439
HMC06CA19B	M12 socket (TACHO)	(	· · · · · · · · · · · · · · · · · · ·	4	85	52180440	S	152180440
HMC06CA20E-s-R	Label sensor sender cable	(HMC06	605/06 to HMC0611)	3(s)	680	52180207	S	152180207
HMC06CA20E-I-R	Label sensor sender cable	(HMC06	605/06 to HMC0611)	3(s)	760	52180454	(S)	152180207
HMC06CA20E-I	Label sensor sender cable	(HMC06	605/06 to HMC0611)	3(s)	550	52180455	(S)	152180207
	Label sensor receiver cable	(1111000		2(s)	750	52180215	s (C)	152188562
	AC power line cable for MEA	adanter		2(0) 3	1250	52180443	Ũ	152180443
	Adapter DISP cable	adaptor		2	150	52180444	ç	152180444
	AV/A Driver Biggyback cable			20	1200	52120444	0	152100444
	X WEB Driver Diggyback cable		S14 to TIME00005)	20	1200	52100445		152100445
	N-WEB Driver Figgyback c.			20	1500	52100440	<u> </u>	152100440
	PE -cable Adapter-nousing to	aispens	Sing eage (M3-M4)	1	005	52180447	3	152180447
				1	285	52180448	5	XXXX012CI
	PE -cable Connectorboard		$ou \ge to iviain-housing)$	1	125	52180449	5	152180449
HMC06CA29A	Nonstop cable	(HMC06	602 to HMC0602)	13	3000	52180450		152180450
HMC06CA30A	Connection box cable	(HMC06	502 to HMC0604-2)	25(s)	2000	52180451		152180451



Name	Description		Pins	Length [mm]	Part- number	Stand. S	Drawing- number
HMC06CA31A	Ext.Operatorpanel cable	(HMC0602 to HMC0609)	5	2000	52180006		152180429
HMC06CA32A	Adapter connection cable	(HMC0605 to HMC0603)	20	500	52180452		152180452
HMC06CA33A	Connection module cable	(HMC0602 to HMC0604-1)	25(s)	2000	52180453		152180453
HMC06CA34A	Extension-cable-Indicator-LED		4	700	5218		15218
HMC06CA35A	Indicator-LED-cable	(KT – Schneider Electric)	4	150	5218		15218



## **Register I**

### **SIL REPORT**

Calculation of the safety level SIL has been performed and documented using the Siemens safety evaluation tool. The standard used is IEC 62'601. The resulting SIL is < 1 or equal to 1. Safety measures are not requred with a SIL <= 1. However, they may be included as an option (LOCK input).

Ergebnisbericht	Datum: 30.10.09
Safety Evaluation Tool	
	Parist College 190
Name: Anzuwendende Norm:	Projekt Collamat NG IEC 62061, Sicherheit von Maschinen - Funktionale Sicherheit sicherheitsbezogener elektrischer, elektronischer und programmierbarer elektronischer Steuerungssysteme
Projektverantwortlicher:	Dial El Ing HTI /EH Paul Schneider
Projektorüfer:	Andreas Strobel
Anlagentyp:	Labeling unit
Dokument zur Gefahrenbeurteilung:	Collamat-NG-Risikobeurteilung-001
Beschreibung:	Labeling unit Collamat NG WWW R D - whereas WWW = max.paper width, R = Rewinder type P=passive rewinder (default) or active rewinder (optional), D=direction L=left or R=right LOCK-input (1 channel) NOT-HALT LOCK-input and LOCK-inv-input (2 channel - optional) NOT-HALT
SET Version:	1.5.0-20091020
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**Register J** 

