



G+D  
Currency Technology

# Service Manual

BPS® C1



Original operating  
instructions

Art.-No. 503428051  
Issue 01/2020



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**Disclaimer**

The specifications stated in this documentation do not represent guaranteed characteristics.

This documentation is based on the machine type BPS® C1, Release 3.3; Main Firmware DSP V002.075 and User Interface UI V005.012

Subject to technical changes.



This product meets the safety requirements of the relevant EU directives and complies with the EN standards as listed in the EU Declaration of Conformity.



This product has been awarded the GS mark for "tested safety" by an independent test and certification body, after type-testing according to the German Product Safety Act (ProdSG, section 20 and section 21).

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**Technical support**

→ *Chapter E "Technical Support", p. 305*

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## Changes

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### Issue Overview

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Version	Change
1	Pre-production series (Prototyp)
2	Series production
3	Edition for product release 2.3
4	Edition for product release 2.5
5	Edition for product release 3.0
6	Edition for product release 3.3

- → *Section 1.3 “Content and Structure of This Manual”, p. 2*  
Chapter updated
- → *Chapter 4 “Overview Sensors and Photo Detectors”, p. 19*  
Figure with 19 channel thickness sensor added.
- → *Section 10.19 “Removing Speaker”, p. 91*  
New procedure
- → *Section 11.8 “Removing Power Supply Assembly”, p. 103*  
Hint for fan replacement inserted.
- → *Chapter 13 “Retrofitting”, p. 127*  
Section updated
- → *Section 13.3 “Using LED Self-Retaining Clip to Prevent Wrong Solenoid Error”, p. 132*  
New section
- → *Chapter 15 “Cleaning”, p. 143*
- → *Section 17.1.1 “Checking Sensor Status - Test Sensor”, p. 157*  
Procedure updated
- → *Section 17.2.1 “Preparing the SD Card”, p. 160*  
Procedure updated
- → *Section 17.3 “Calibrating Sensors ”, p. 164*  
MG calibration added
- → *Section 17.7 “Setting Device Parameters”, p. 199*  
Procedure updated
- → *Section 17.7.1 “Setting the Capacity of the Reject Stacker”, p. 201*

Procedure updated

- → *Section 17.7.2 “Setting the Capacity of the Delivery Stacker”, p. 202*

Procedure updated

- → *Section 17.7.12 “Setting Call Service”, p. 216*

New function

- → *Section 17.7.14 “Export or Import Machine Settings”, p. 221*

New section

- → *Section 17.7.15.3 “Setup Machinery Action”, p. 232*

Procedure updated

- → *Section 17.7.15.4 “Setup Report”, p. 236*

Procedure updated

- → *Chapter 18 “GD\_PCSuite Software”, p. 241*

New software directories

- → *Section 18.2 “BPS C1 Connecting and Installing Driver Software”, p. 242*

Information on installing driver software manually for Windows 10

- → *Section 18.3.1.1 “Starting Viewer”, p. 256*

Program start corrected

- → *Section 18.3.2.1 “Starting the Reader”, p. 267*

Note added on data base size

Program start corrected

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# 1 About This Manual

This chapter contains the following information:

- Overview of all manuals in the BPS C1 operating instructions
- Target group of this manual
- Content and structure of this manual
- A description of the conventions used in this manual

## 1.1 Overview of All Manuals for the BPS C1 System Operating Instructions

### Quick Start Guide

This manual forms part of the System Operating Instructions. The following manuals form part of the System Operating Instructions:

These quick instructions are intended for all users of the product. They describe the first steps without using text so that the user can operate the product. The quick instructions are supplied with the product.

### Safety Information

The safety information is intended for all users of the product. It describes all the necessary safety measures for hazard-free use of the product. The safety information is supplied with the product.

### User Manual

The user manual is intended for all users of the product and can contain the following information:

- Requirements for the installation site as well as for the transport and secure operation of the product
- Technical data for the product
- Installing and connecting the product
- Operating the product and straightforward cleaning and maintenance work that is not performed by Service
- Installing and using the software applications

The user manual and the software application are provided in the download area. The link to the download area can be found in the quick start guide.

### Service Manual

The Service Manual describes maintenance work carried out on the product by field engineers.

The maintenance work includes:

- The replacement of parts for repairs (corrective measures) including the necessary adjustment work
- Installing and using the software application for Service

Troubleshooting Manual

You will only receive a service manual after you or your staff have received training from G+D to become a field engineer.

The Troubleshooting Manual offers an interactive troubleshooting including links to detailed procedures and video tutorials.

The Troubleshooting Manual is only available as part of the electronic documentation library EB Suite. The contents of the Troubleshooting Manual depend on your access rights.

Spare Parts Catalog

Please use the electronic spare parts catalog for Banknote Processing Systems on CD/DVD to order spare parts.

## 1.2 Target Group of this Manual

The manual is intended for the service technician.

## 1.3 Content and Structure of This Manual

This manual contains the following:

- The → "Safety" chapter which contains important safety information.
- The → "Assembly Overview" chapter contains the designation of the components and the type label.
- The → "Overview Sensors and Photo Detectors" chapter provides an overview of the sensors and photo detectors installed.
- The → "Tools" chapter provides an overview of the required tools.
- The → "Requirements Parts Replacement" chapter describes the safety requirements for all service works.
- The → "Removing Cover" chapter sets out the procedures for removing the cover of the machine.
- The chapters → "Parts Replacement in the Cover", → "Parts Replacement in the Top Module", → "Parts Replacement in the Middle Module", → "Parts Replacement in the Lower Module" describe in detail the procedures for parts replacement.
- The → "Replacing Toothed Belts" chapter describes how to replace the toothed belts of the machine.
- The → "Retrofitting" chapter sets out procedures for retrofitting.
- The → "Adjustment" chapter sets out procedures for adjusting components.
- The → "Cleaning" chapter sets out the procedure for cleaning the machine.

- The → "Preventive Maintenance" chapter provides a checklist for the preventive maintenance workflow.
- The → "Maintenance Mode" chapter sets out procedures for testing and settings in Maintenance Mode.
- The → "GD\_PC Suite Software" chapter describes the installation and the procedures of End User Tool and Distributor Tool.
- The → *Appendix* includes the following additional information
  - Technical data
  - Cabling diagram
  - Belt diagram
  - List of cables
  - Contact addresses
  - Glossary
  - Table of figures
  - Index

## 1.4 Conventions Used in this Manual

### 1.4.1 General Document Conventions

The following formatting styles are used as standard to identify certain information:

Conventions	Definition
<u>This text is important.</u>	Underlined text indicates important information.
<b>Mechanical operating control</b>	Names of mechanical operating controls like keys or switches are written in bold.  Example: Press <b>Start</b> on the device.
<b>GUI Text</b>	Objects in the graphical user interface (GUI), e. g. a button, are in bold.  Example: Click <b>OK</b> .
<b>Menu option &gt; Menu option</b>	Menu names are in bold. Angle brackets indicate navigation through menus.

Conventions	Definition
	Example: Select <b>File &gt; Print</b> from the menu.
'User input'	User inputs are in single quotes. Example: Enter <b>port = '8080'</b> .
<Placeholder>	Placeholders for display text or user input are in angle brackets. Example: Enter <Password>.
[Key]	Keys on the keyboard are in square brackets. Example: Press [Alt] + [p] to print the file.
<i>File or path</i>	File names or paths are in italics. Example: Open <i>readme.txt</i> .
Command	Commands are in Courier font. Example: Open an input window and enter <b>ping</b> .
Code	Codes are in courier font.
"Title"	Titles of reports, logs, modes, windows, etc. are in quotation marks. Example: The "xy" window appears.
→ " <i>Manual title</i> "	References to other manuals are in italics. The manual title is also in quotation marks. Example: → " <i>Service Manual</i> "
→ <i>Chapter "Chapter heading"</i>	References to other chapters/sections are in italics. The title of the chapter/section is also in quotation marks. For example, → " <i>Jam Recovery</i> " chapter
<i>Homepage Giesecke +Devrient</i>	References to a website address are in italics.

Conventions	Definition
1. list entry 2. list entry	In numbered lists, make sure you follow the sequence of list entries.
● list entry ● list entry	In unnumbered lists, the sequence of list entries is not important.
a) list entry b) list entry	In alphabetical lists, the list entries give alternatives.
	This symbol identifies important information.
*	* indicates optional components. Inquire if the option is available on your machine.
[1]	Numbers in square brackets indicate individual operational steps. You must carry out these steps in the sequence indicated.
⇒	An arrow as shown after a step indicates the result of that step.

#### 1.4.2 Document Conventions for Procedures (Instructions)

This section explains how procedures (instructions) are set out.  
Follow procedures step by step in the specified order.

Requirements for the Procedure

- Requirement 1
- Requirement 2



#### DANGER

Safety information before the procedure

Applies to the whole procedure

Observe the measures to prevent risks at each step.

## Procedure

- [1] Perform this step.



- [2] Perform this step. Note the image above.

⇒ Result of this step



Figure 1: Image of a Result

## Secondary Steps

- [3] To perform this step:  
 [3-1] Perform this secondary step.  
 [3-2] Perform this secondary step.

## Prompts to Skip or Repeat Steps

- [4] Prompt, e.g. has the error been rectified?  
 No: → [5]  
 Yes: → [6]
- [5] Only carry out this step if you answered the above prompt with No.  
 Continue with: → [7]
- [6] Only carry out this step if you answered the above prompt with Yes.  
 Continue with: → [7]
- [7] Perform this step.

## Alternative Steps

- [8] Select the appropriate alternative:  
 For variant A: → [8a]  
 For variant B: → [8b]
- [8a] Variant A

[8a-1] Perform this step for variant A.

[8a-2] Perform this step for variant A.

[8b] **Variant B**

[8b-1] Perform this step for variant B.

Result

⇒ Result of the procedure

### 1.4.3 Figures Used

The screenshots used are examples and may differ from what is actually shown on the display.

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## 2 Safety

Before you work with our product, you must have previously read and understood the system operating instructions and especially the safety instructions they contain. You may only then operate and maintain our product if you are trained and authorized to do so. Remain conscious of safety as you work.

This chapter contains the following information:

- Overview of the general symbols for safety information
- Overview of the symbols identifying specific hazards
- Safety instructions for BPS C1

### 2.1 Safety Information Symbols



#### DANGER

The symbol together with the signal word DANGER indicates an immediate risk to life or health.

Ignoring this warning will result in death or serious injury.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.



#### WARNING

The symbol together with the signal word WARNING indicates a possible risk to life or health.

Ignoring this warning may result in death or serious injury.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.



#### CAUTION

The symbol together with the signal word CAUTION indicates a possible hazard to health.

Ignoring this warning may result in minor injury.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.

**NOTICE**

This symbol, with the signal word **NOTICE**, is used to identify warning information.

Ignoring this information may result in damage to parts of the product or jeopardize data consistency.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.

## 2.2 Symbols Used to Identify Specific Hazards

**DANGER**

Risk of crushing

This symbol indicates a danger from crushing by moving parts.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.

**DANGER**

Risk of electric shock

This symbol indicates a danger of electric shock.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.

**DANGER**

Risk from LED radiation

This symbol indicates a danger from LED radiation.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.

**DANGER**

Risk of burns

This symbol indicates a danger from burns from hot parts.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.

**DANGER**

Risk of tripping

This symbol indicates a risk of tripping.

The safety information tells you about the type and source of the risk, the consequences if it is not observed, and the measures to take to prevent the risk.

2

## 2.3 Safety Information

### 2.3.1 Proper Use

Our product has been constructed using the latest technology and is safe for operation. For your safety, you must use it appropriately and properly.

You must comply with the necessary safety measures for hazard-free use of the product. Failure to follow these instructions can put lives at risk or can damage the product.

Always take notice of the safety warnings, even if you are an experienced user with good system knowledge.

#### Proper Use

A banknote processing system may only be used to check banknotes for denomination, authenticity, and condition, to count and to sort them.

The processing of tickets is permitted.

The processing of checks is permitted.

#### Improper Use

Improper use, for example, the singling of hard objects such as coins, paper clips and staples, is not permitted and will result in the invalidation of the warranty.

### 2.3.2 Prohibition of Unauthorized Modifications or Changes

For safety reasons, no changes may be made to the product without informing and receiving written approval from the manufacturer.

Any unauthorized structural changes or additions invalidate the EU Declaration of Conformity for the product.

Any unauthorized structural changes or additions invalidate the GS mark approval for the product.

Only genuine spare parts may be used for repair.

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### 2.3.3 Circumstances Under Which the Product May Not Be Operated

The product may not be operated if the ambient and operating conditions listed in the → "BPS C1 Site and Facility Requirements" section of the system operating instructions are not fulfilled.

If the product is not in an operational state for technical or other reasons, you must prevent the product from being started up.

### 2.3.4 Safety Information to Protect Persons

Be sure to comply with national accident prevention regulations.

When working on the product, respect the following:

- Avoid wearing loose-fitting or open clothing.
- Remove ties, rings, watches, and jewelry before beginning work.
- Protect long hair with a scarf or hair net.

Refrain from any working method that may impair the operational safety of the product. Proceed in accordance with the safety information specified in the system operating instructions.

Ensure that unauthorized persons are kept away from the product.

Check the product for any externally identifiable damage and defects. Immediately report any safety-related changes (including in the operating behavior) to the internal department responsible.

Only operate the product when it is in perfect working condition.

Do not remove any safety devices. Do not disable any safety devices. This can put lives at risk or cause damage to the product.

Once service work is complete, you must check the safety devices. Log this check.

### 2.3.5 Safety Information on LED Radiation

This section contains safety information on optional components or external equipment containing LED radiation sources.

These components or devices are classified under IEC 62471 as LED devices.



**WARNING**

LED radiation

can cause damage to the eyes.

The ban on unauthorized alterations or changes applies universally to the mechanical, optical, and electronic parts of these components.

Improper usage can be hazardous due to dangerous LED radiation.

Opening the BPS C1 product does not increase the LED risk group or the risk to the operator.

2

#### 2.3.5.1 Ticket Reader Lighting

Risk Group 1

The lighting on the optional ticket reader is classified as a risk group 1 LED product (low risk) in accordance with IEC 62471.



**CAUTION**

Intensive light source

Risk Group 1 (low risk) in accordance with IEC 62471.

Do not look into the beam from the light unit directly or with optical instruments.

#### 2.3.6 Information on Special Dangers for the Operator

During operation of the product, observe the following information:

##### Electrical Voltage/Current

Work on live parts and assemblies carries the risk of electric shocks. Only carry out this work if you are authorized to do so.

##### Non-Specified Materials

Dangers may arise from the use of non-specified materials such as cleaning material, sprays, lubricants, etc. If you use these materials, follow the manufacturer's safety instructions.

##### High Temperatures

Do not touch any parts that have warnings in the system operating instructions alerting you to high temperatures. These can cause severe burns.

## Risk of Crushing

- When closing flaps, doors, transport sections, etc., be careful that your hands or fingers are not crushed between the closing edges. Use the operating equipment provided.
- When starting the singler, make sure that your hand is not in the singler area.

## Dust

Never use compressed air to clean the product. Breathing in dust can lead to health problems. Dust in the air can also damage the bearings and electronic parts. No claims can be made under the warranty for parts that are damaged in this way. Always vacuum up any dust with a suitable vacuum device, fitted with a micro-filter.

### 2.3.7 Additional Safety Information for the Field Engineer

The maintenance and repair tasks are described in the service documentation of the system operating instructions.

#### Securing the Product Environment

If you are required to operate the product in an opened condition, ensure that no persons are in the immediate vicinity of the product. Prevent access to moving or current-carrying parts under all circumstances. If necessary, put up warning signs and/or barriers.

#### Safety Measures While Working on the Product

Remove the power plug for all repair and maintenance works that can be performed without current being supplied, and protect the product against being switched back on.

Extreme care should be taken when carrying out any adjustments or measurements that require the product to be switched on.

#### Safety Devices

If disabling or removing safety devices is necessary for maintenance and repair work, then you must fit the safety devices immediately on completion of the maintenance and repair work. Only after this is done are you permitted to release the product for operation.

#### Notes on Working with the System Switched On

Certain tasks must be performed with the product switched on. Be aware of the increased risks involved. You must be authorized to undertake this work.

**Working on Current-Carrying Units**

If you are required to perform work on current-carrying units, you may only undertake this work under stringent compliance with the national safety guidelines. The prescribed tools must be used.

**Danger from Hot Parts**

During operation, parts may become very hot.

Take extreme care when removing or working on these units. You find warnings on the risk of burns in the system operating instructions.

2

**Information on Working on a Product in Operation**

There are some tasks that you have to perform while the product is in operation. Be aware of the increased risks involved. You must be authorized to undertake this work. The instructions for working on the machine when it is switched on are applicable. In addition, the following instructions apply.

**Service Mode**

If you operate the product in service mode, some of the safety devices are deactivated. Deactivating the safety devices enables you to carry out tests and measurements.

When the service work is complete, you are only permitted to switch the product from service mode back to normal mode and hand it back to the operator with the paneling closed.

**Motion Sequence Testing**

If you are testing motion sequences (for example, as part of preventive maintenance), you must ensure that no-one is in the immediate vicinity of the product.

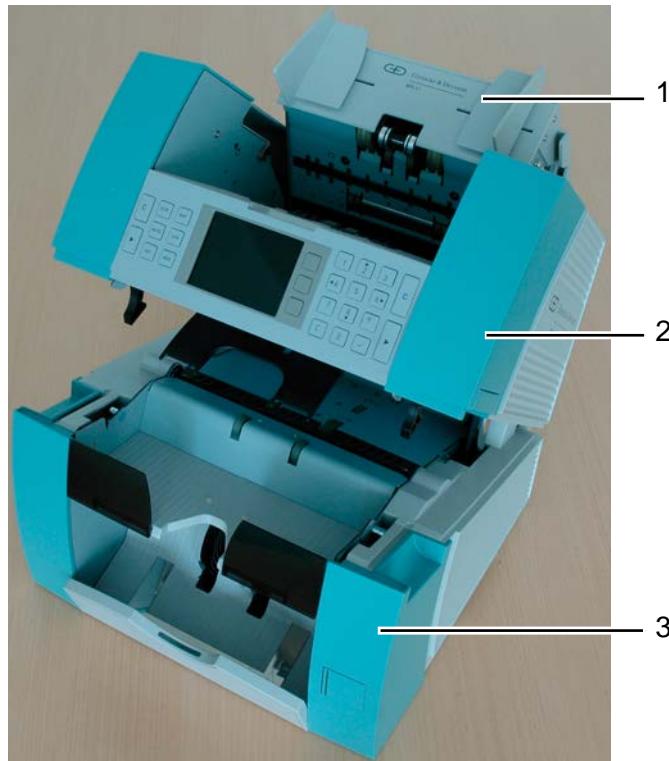
Carelessness can lead to injuries in tests requiring manual intervention. Restrict such interventions to what is absolutely necessary.

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### 3 Assembly Overview

The machine has the following assemblies:



**Figure 2: Assembly Overview**

- 1 Top module
- 2 Middle module
- 3 Lower module

### 3.1 Type Label

The BPS C1 has the following type label:

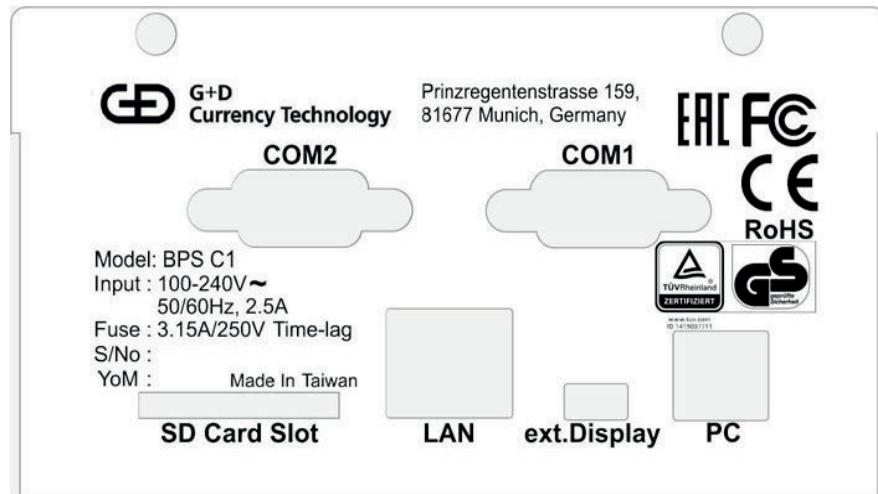


Figure 3: Type Label

You will find the type label on the rear of the BPS C1.

## 4 Overview Sensors and Photo Detectors

When the upper module is opened, you find the following sensors and photo detectors in the machine:

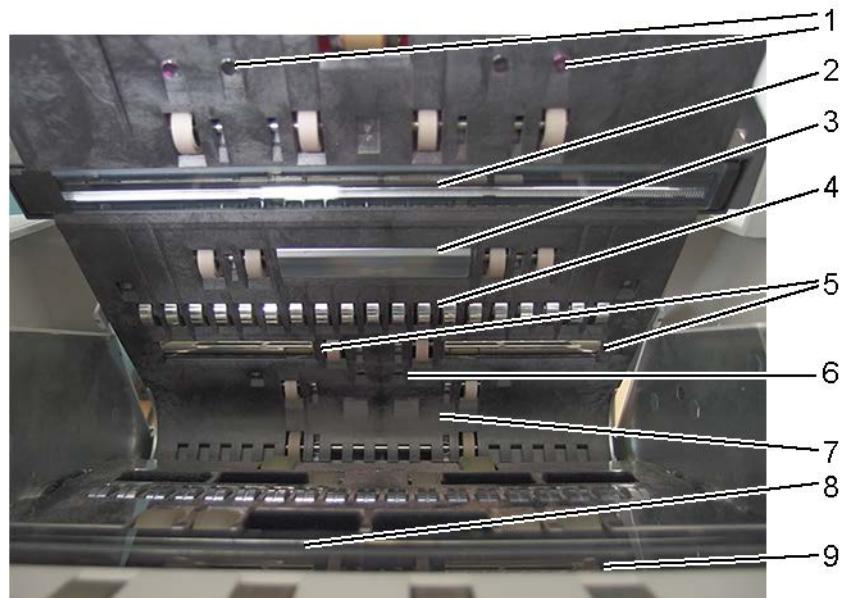


Figure 4: Overview Sensors and Photo Detectors with 19 Channel THS



Figure 5: Overview Sensors and Photo Detectors with 12 Channel THS

- 1 Photo detector PD1L/PD1R (circuit board TT0/TT1)
- 2 Print image sensor CIS (upper)  
Detecting banknote image for serial number and ticket reading
- 3 Magnetic sensor MRS  
Detecting magnetic patterns

- 4 Mechanical thickness sensor THS  
12 mechanical channels from machine serial number T01xxxxx up to T11xxxxx.  
19 mechanical channels starting with serial number M0300001 and HW Rel. 3.0.
- 5 Magnetic sensor MT  
Detecting magnetic features and security threads
- 6 Ultraviolet sensor and photo detector (PD2) (circuit board TUV)  
Detecting ultraviolet features
- 7 Ultraviolet sensor (circuit board TRU - 2 UV channel)  
Detecting ultraviolet features  
Available with serial number T1102061 to T1102079, T1102727, and higher as well as for M0300001 and higher.
- 8 Print image sensor CIS (lower)  
Detecting banknote image for serial number and ticket reading
- 9 Light guide

## 5 Tools

---

For the parts replacement, you need the following tools:

Spring scale	10 N
Feeler gauge	20-sheet with 0.05 mm or 2-sheet 0.1 mm
Combination wrench	Size 7
Allen key with handle	Size 3
Tweezers	bent-nose
Tweezers	straight
Set of Allen keys	Size 1.5-5 and 1/16"
Screwdriver cross-head	PH1 and PH2
Screwdriver	Size 1.5
Wire cutter	small
Long nose pliers	straight
Circlip plier	thin top angeled
Offset screw driver	PH1

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## 6 Prerequisites for Parts Replacement

You find step-by-step descriptions for removal of all components concerned.

The following prerequisites must be satisfied for all works.



### DANGER

Risk of electric shock

Electric shock may cause death or serious injury.

1. Before starting any work, switch off the machine/device.
2. Unplug the power plug from the power socket.
3. Secure the machine/device against being switched back on.



### CAUTION

There is a risk of crushing when closing the machine.

You may trap your fingers.

When closing, be careful not to crush your fingers.



### CAUTION

Risk of burns

During operation of machine in service mode, freely accessible parts may heat up.

1. Make sure that no one is in the immediate vicinity of the machine.
2. Do not touch any parts that heat up during operation.
3. Before the machine is released for use by the operator again, deactivate service mode and put all protective elements back in place.



### NOTICE

Static electricity

can cause permanent damage to electronic components.

Attach an anti-static band around your wrist. Attach the clip to a grounded metal object.

Use an anti-static band, or "discharge" yourself by touching a grounded metal object before touching the electronic components.

**NOTICE**

Incorrect handling  
can cause permanent damage to circuit boards.

When replacing parts, if possible only hold the circuit board by the  
connectors.

Avoid touching the circuit board itself.

**Important!**

Assembly is in the logical reverse order. Installation is only described in special cases or when the procedure is different.

## 7 Removing Cover

Each module has a cover. The cover on the middle module consists of a left and right side part. The cover on the lower module consists of a left and right side part and a rear panel.

### 7.1 Removing the Top Cover

- [1] Open the top module.



- [2] Remove the four screws (pan head M3x6) on each side.
- [3] Remove the top cover.

### 7.2 Removing the Middle Cover

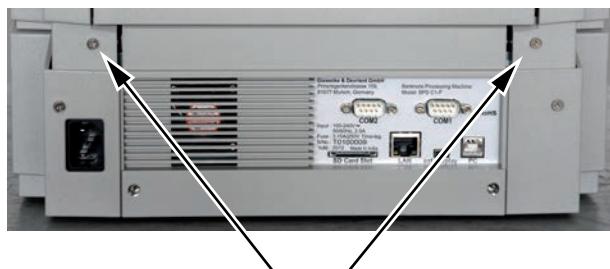
- [1] Open the top module.

**Important!**

Remove the screws in the given order to prevent cover from being bent or broken.



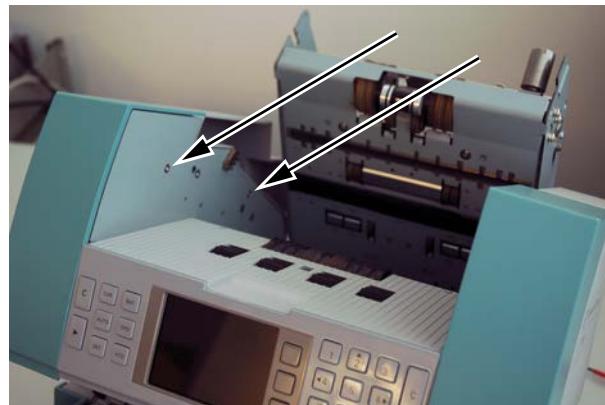
- [2] Remove one screw (countersunk M3x5) on each side.



- [3] Remove two screws (pan head M3x6) on the rear panel.

**NOTICE**

The unsecured cover  
may fall down.  
Hold the cover to prevent breaking.

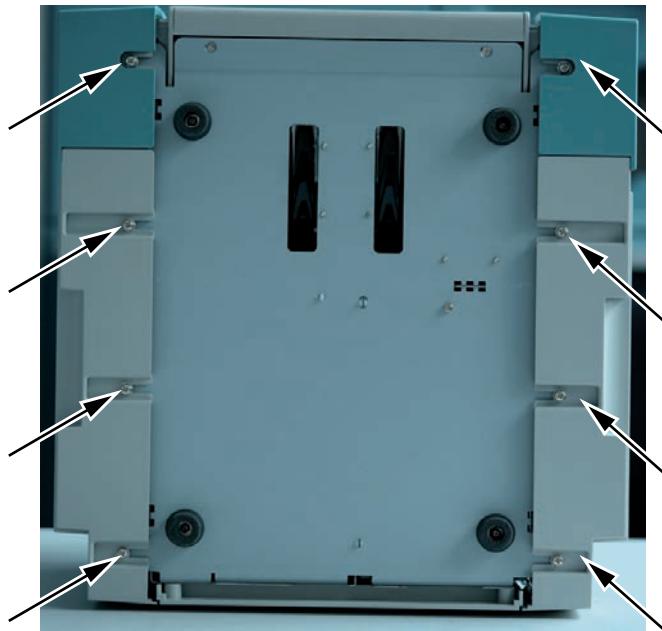


- [4] Remove the two screws (countersunk M3x5) on each side on the inside.
- [5] Remove the middle cover on each side.

7

### 7.3 Removing the Lower Cover

- [1] Close all modules.
- [2] Remove all cables and the SD card.
- [3] Put the device on the back to have access to the bottom.



- 7
- [4] Remove four screws (round head M4x8 with spring washer) on each side on the bottom panel of the machine.
  - [5] Set the device upright again.



- [6] Remove two screws (pan head M3x6) on the rear panel.
- [7] Open the top module.



- [8] Remove one screw (countersunk M3x5) on each side on the inside.

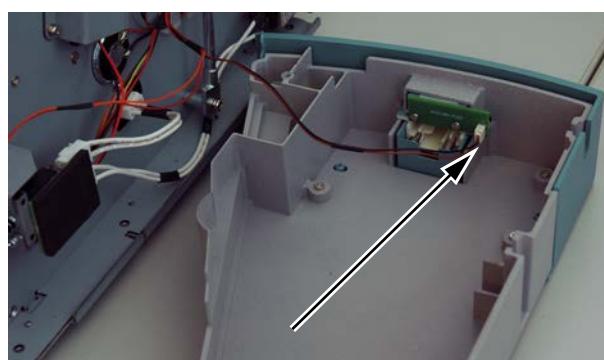
**NOTICE**

Removing the cover on the right may damage the cable.

Take care of the cable while removing the cover.

7

- [9] Remove the side parts of the lower cover.



- [10] Loosen the plug connector on the right side part.



- [11] Remove two screws (countersunk M3x10) on the rear panel of the machine.
- [12] Lift and remove the rear panel of the lower cover.

## 8 Parts Replacement in the Cover

The cover contains the following replacement parts:

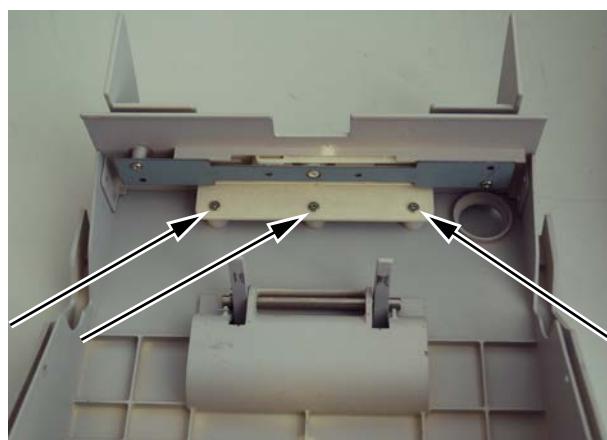


**Figure 6: Replacement Parts in the Cover**

- 1 Banknote guide, complete
- 2 Upper handle (top module)
- 3 Handle left (middle module)
- 4 Handle right (middle module)
- 5 Circuit board PWI (on the inside)

### 8.1 Banknote Guide, Complete

- [1] Remove the cover on the top module.  
→ *Section 7.1 "Removing the Top Cover", p. 25*



- [2] Remove the three screws (round head M3x8 self tapping).
- [3] Remove the banknote guide assembly.

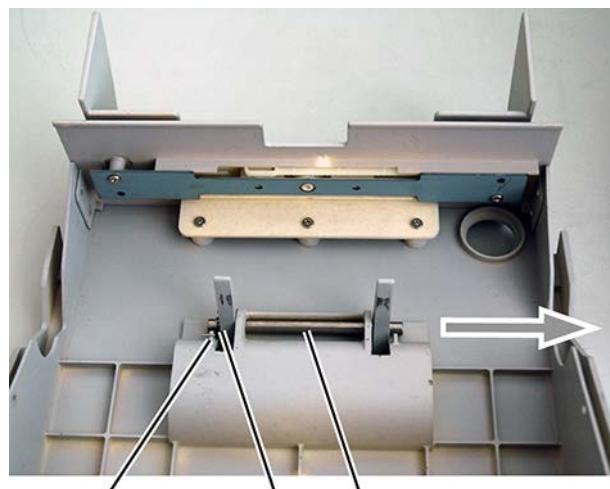
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## Installation

- [4] After installation, test the movability of the banknote guide.

## 8.2 Upper Handle (Top Module)

- [1] Remove the cover on the top module.  
 → *Section 7.1 "Removing the Top Cover", p. 25*



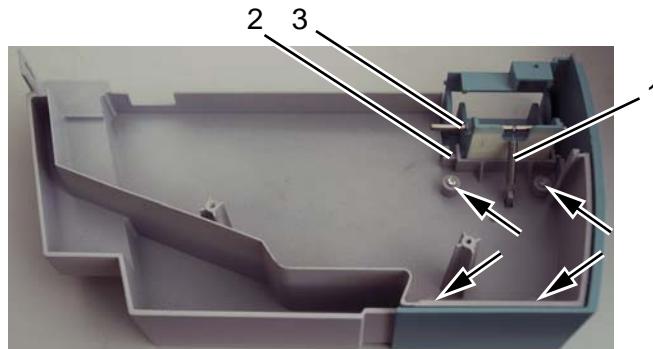
- 8
- [2] Remove the spring (1).  
 [3] Remove the circlip (4 mm) (2).  
 [4] Remove the axle (3) to the right.  
 [5] Remove the handle.

## Installation

- [6] After installation, check the upper handle is free-moving and returning back to basic position.

## 8.3 Handle Right (Middle Module)

- [1] Remove the right cover on the middle module.  
 → *Section 7.2 "Removing the Middle Cover", p. 25*

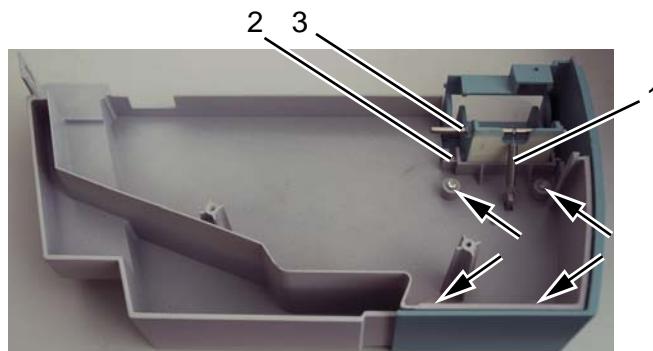


- [2] Unclip the spring at the bottom from the mount (1).
- [3] Remove the four screws (round head M3x8 self-tapping) (see arrows).
- [4] Lift the handle and remove the green part of the cover.
- [5] Remove the axle (2).
- [6] Remove the handle.
- [7] Remove one of the circlips (3 mm).
- [8] Remove the axle (3).

## 8.4 Handle Left (Middle Module)

8

- [1] Remove the left cover on the middle module.  
*→ Section 7.2 “Removing the Middle Cover”, p. 25*

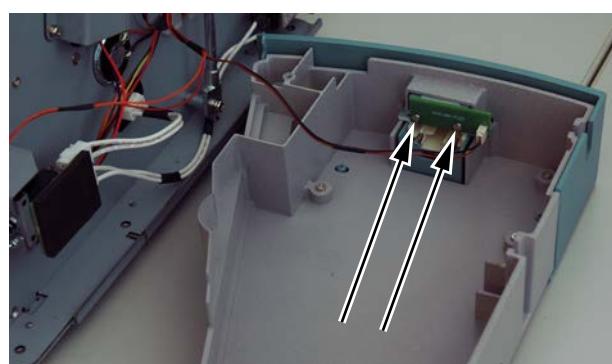


- [2] Unclip the spring at the bottom from the mount (1).
- [3] Remove the four screws (round head M3x8 self-tapping) (see arrows).
- [4] Lift the handle and remove the green part of the cover.
- [5] Remove the axle (2).

- [6] Remove the handle.
- [7] Remove one of the E-type circlips (3 mm).
- [8] Remove the axle (3).

## 8.5 Circuit Board PWI

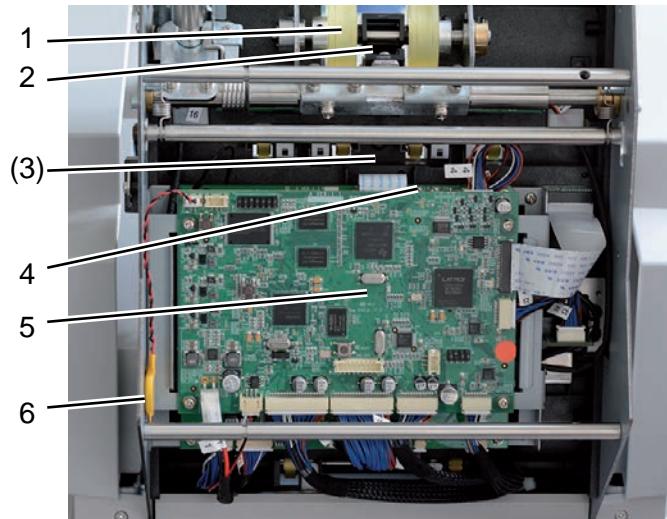
- [1] Remove the right cover on the lower module.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- [2] Disconnect the plug connection of the board.



- [3] Remove the two screws (round head M3x8 self-tapping).
- [4] Remove the circuit board PWI.

## 9 Parts Replacement in the Top Module

The following replacement parts are located in the top module.



**Figure 7: Replacement Parts, Top Module**

- 1 Retarding wheel assembly  
→ *Section 9.4 “Removing Retarding Wheel Assembly”, p. 58*
- 2 Pinch roller  
→ *Section 9.5 “Removing Pinch Roller”, p. 59*
- 3 Sensors and circuit boards behind  
→ *Section 9.3 “Removing Sensors, Photo Detectors, and Associated Circuit Boards”, p. 43*
- 4 Circuit board S and IO behind circuit board A  
→ *Section 9.1 “Removing Circuit Board A, S, and IO”, p. 35*
- 5 Circuit board A  
→ *Section 9.1.1 “Removing Circuit Board A”, p. 36*
- 6 RTC Battery  
→ *Section 9.2 “Removing RTC Battery”, p. 43*
- x Transport/Passive Rollers (not illustrated)  
→ *Section 9.6 “Removing Transport/Passive Rollers”, p. 61*

9

### 9.1 Removing Circuit Board A, S, and IO

The three circuit boards A, S, and IO are connected with one another.

To replace the sensors and circuit boards that are located behind it, see:

→ *Section 9.3 “Removing Sensors, Photo Detectors, and Associated Circuit Boards”, p. 43*

To replace the three circuit boards A, S and IO, proceed as follows.



### **Important!**

During installation:

- Check the connections of the S and IO board before installing the A board.
- Check that the plug connections are connected properly.
- The plug connections are numbered.

#### **9.1.1 Removing Circuit Board A**

Hints on Replacement of Circuit Board A

The following settings are stored on the circuit board A:

- Serial number
- License key
- Software configuration (LAN, adaptations)
- Calibration



### **Important!**

These settings are permanently lost if the circuit board A is replaced.

The following steps have to be done after the replacement:

- → *Section 9.1.2 “Configuring Circuit Board A After Replacement”, p. 38*
- 

Requirement

Cover of top module has been removed.

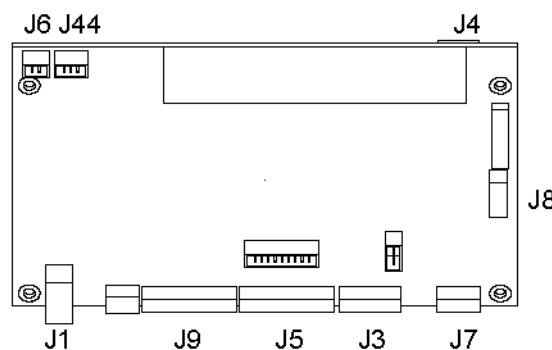
→ *Section 7.1 “Removing the Top Cover”, p. 25*



### **Important!**

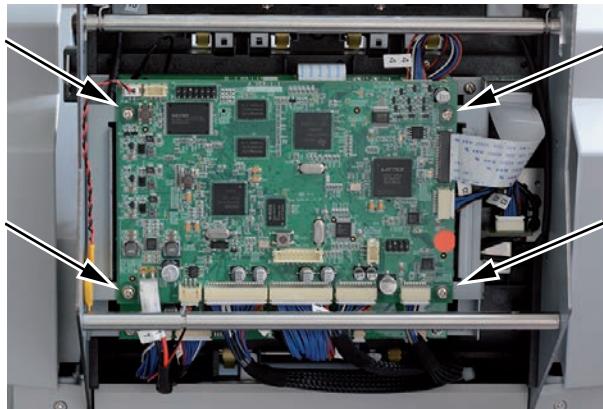
Only remove the battery plug connection if you have to replace the circuit board A.

## Disconnecting Connectors and Cables



- [1] Disconnect the battery connection (3).
- [2] Disconnect all plug connections (1) from circuit board A.
- [3] Disconnect the flat cable (2) by bending slightly.

## Removing Circuit Board A



- [4] Remove the four screws (round head M3x6 with spring washer).
- [5] Remove the circuit board.

### 9.1.2 Configuring Circuit Board A After Replacement

The following settings are stored on the circuit board A:

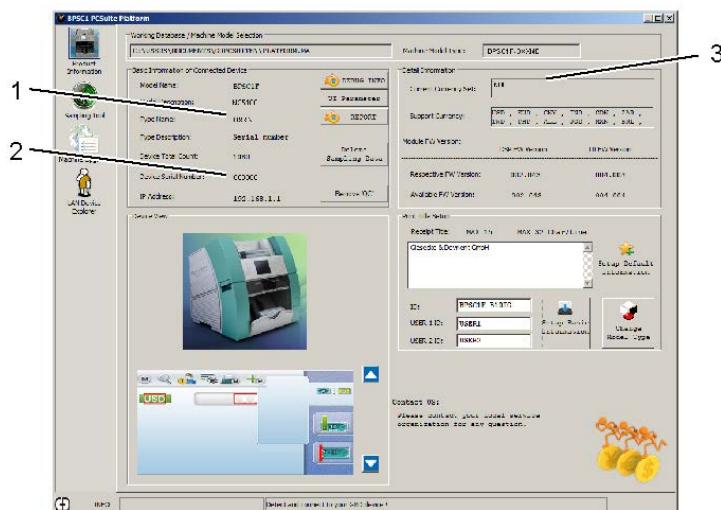
- Serial number
- License key
- Software configuration (LAN, adaptations)
- Calibration

These settings are permanently lost if the circuit board A is defective. Therefore a new circuit board A has to be initialized.

The following steps have to be done after the replacement:

#### Configuring Circuit Board A

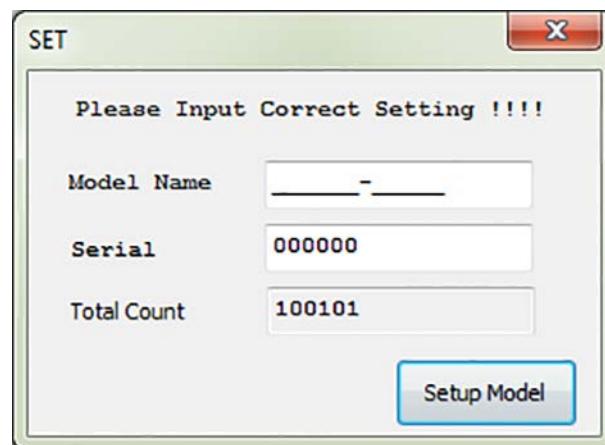
- [1] Connect the machine to the PC/laptop via USB.
- [2] Switch on the machine.
- [3] Start the Distributor Tool (→ *Section 18.4 “Using the PCSuite – Distributor Tool”, p. 269*)
  - ⇒ The main menu appears.



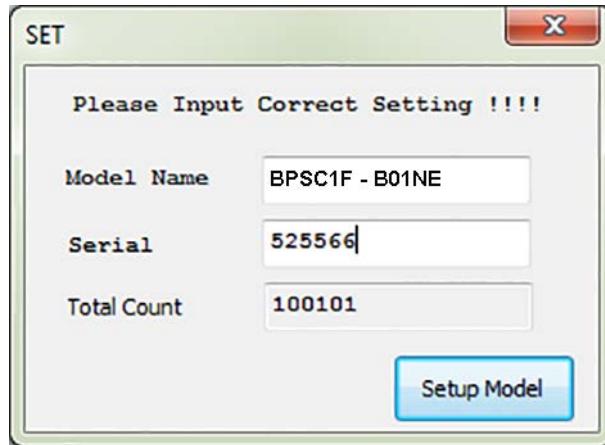
**Figure 8: Distributor Tool - Main Menu After Replacement of Circuit Board A**

- 1 Model description and type name was reset
- 2 Device serial number was reset
- 3 Current currency set was reset

The following pop-up screen is displayed.



- [4] Insert the original model name (known as model type).
- [5] Insert the serial number in the pop-up window.  
Use the last six digits from the type label of the machine.



**[6] Select Setup Model.**

⇒ The main menu appears.

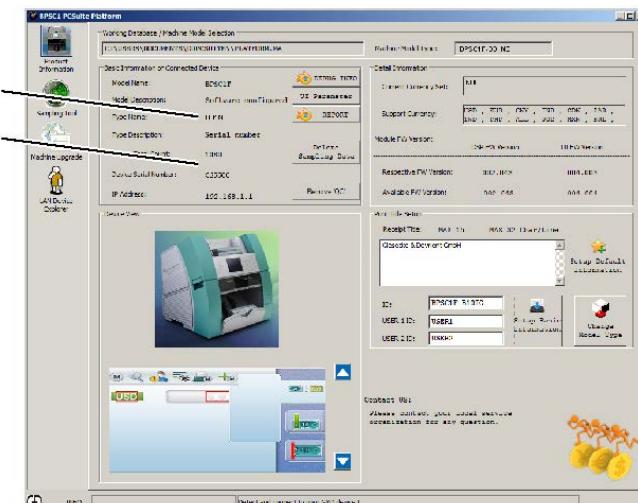


Figure 9: Distributor Tool - Main Menu After Configuration of Circuit Board A

- 1 Model description and type name is updated
- 2 Device serial number is updated

**[7] Install or upgrade currencies or software.**

→ *Section 18.4.6 “Updating the Machine”, p. 282*

**[8] Calibrate the sensors.**

### 9.1.3 Removing Circuit Board S

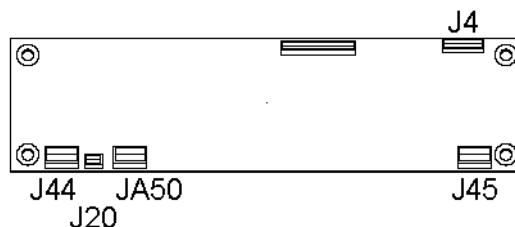
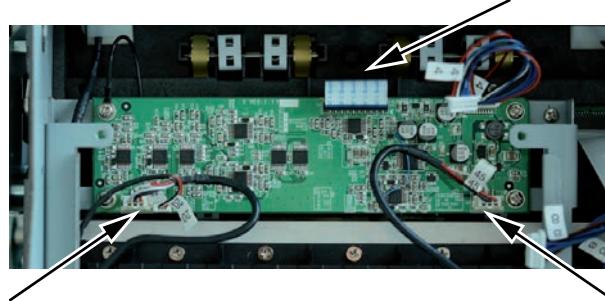
#### Requirement

- Cover of top module has been removed.  
→ *Section 7.1 “Removing the Top Cover”, p. 25*
- Circuit board A has been removed.  
→ *Section 9.1.1 “Removing Circuit Board A”, p. 36*

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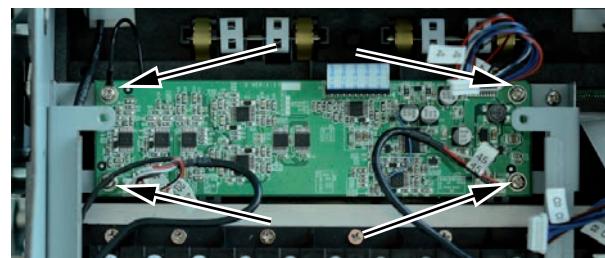
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### Disconnecting Cables



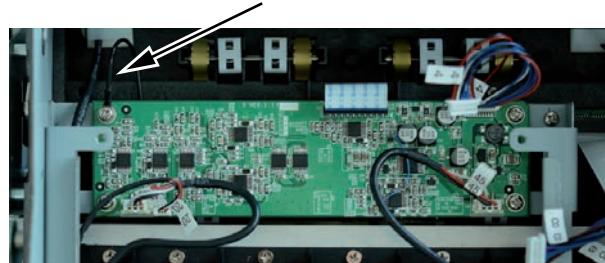
- [1] Disconnect the plug connections from circuit board S. Connection JA50 for circuit board TRU from board with item number 504827011 on (see drawing). The photo above shows the board with item number 504827001.
- [2] Disconnect the flat cable by bending slightly.

### Removing Screws



- [3] Remove the four screws (round head M3x6 with spring washer) of circuit board S.

### Removing Ground Cable



- [4] Remove the ground cable.

## Removing Circuit Board S

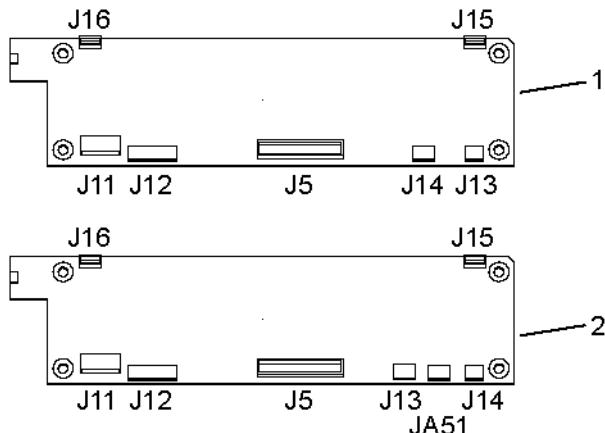
[5] Remove the circuit board S.

### 9.1.4 Removing Circuit Board IO

## Requirement

- Cover of top module has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*
- Circuit board A has been removed.  
→ *Section 9.1.1 "Removing Circuit Board A", p. 36*

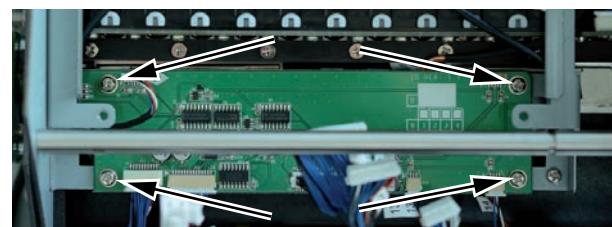
## Removing Plug Connectors



[1] Disconnect all plug connections from circuit board IO

- Circuit board IO item number 503436001 (1)  
For devices with serial number T1100816-T1102060,  
T1102080-T1102726.
- Circuit board IO item number 503436011 (2)  
For devices with serial number T1102061-T1102079,  
T1102727 and higher.

## Removing Screws



[2] Remove the four screws (M3x6 with spring washer) of circuit board IO.

### Removing Circuit Board IO

- [3] Remove the circuit board IO.

## 9.2 Removing RTC Battery

The RTC (real time clock) battery for alternate source of power is on the right side of the top module.

### Requirement

Cover of top module has been removed.

→ *Section 7.1 "Removing the Top Cover", p. 25*

### Removing RTC Battery



- [1] Disconnect the plug connection to circuit board A using tweezers.
- [2] Insert tweezers into the slot and loosen the plug connection.
- [3] Remove the battery from side plate.

### Installation

- [4] Before installation, remove the adhesive protection from battery body.



#### Important!

Adjust the system time after replacing the RTC battery.

→ *User Manual*

9

## 9.3 Removing Sensors, Photo Detectors, and Associated Circuit Boards

The following sensors, photo detectors, and circuit boards can be replaced - see illustration below.

## Overview Sensors and Photo Detectors Front View

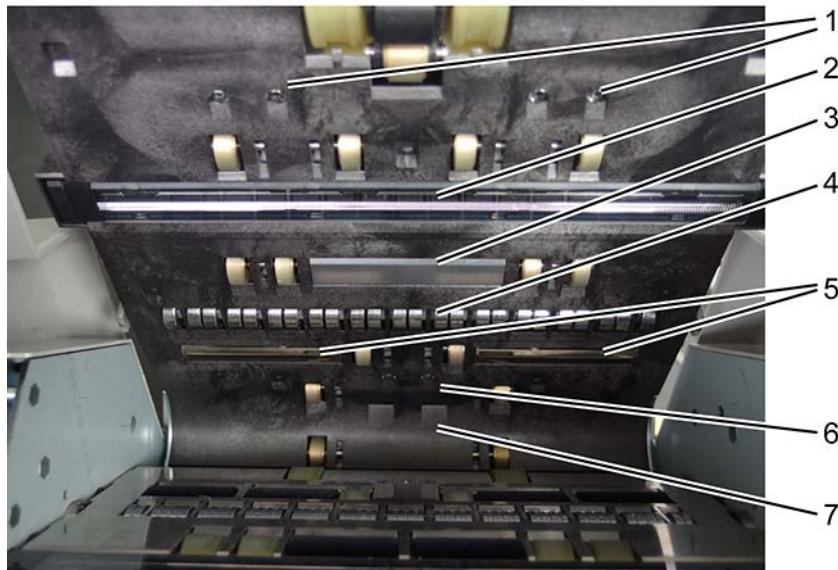
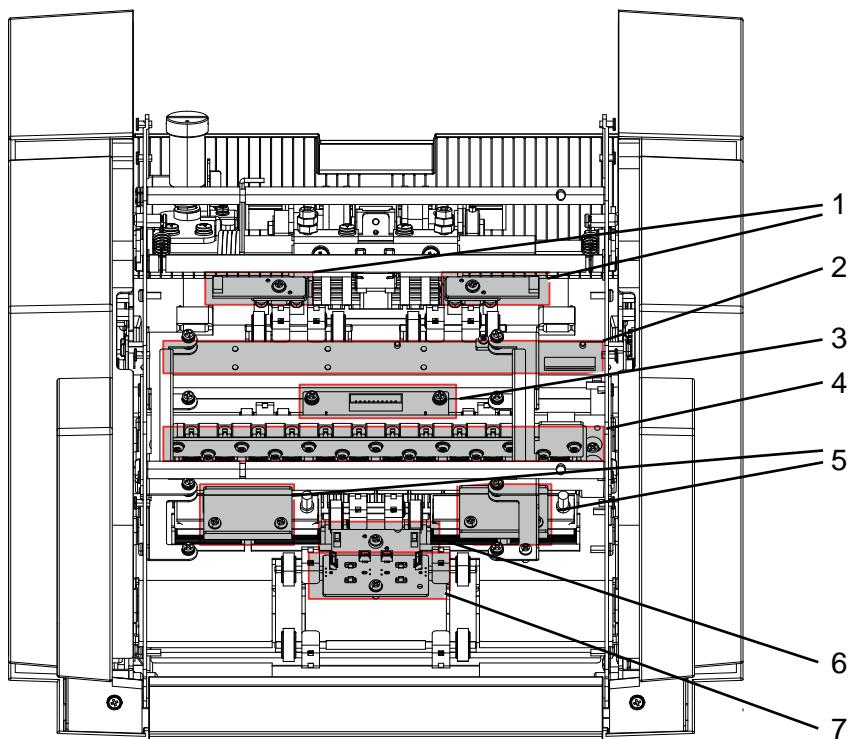


Figure 10: Sensor and Detectors, Top Module Opened

- 1 Photo detector PD1L/PD1R (circuit board TT0/TT1)  
 → *Section 9.3.8 “Removing Circuit Board TT0/TT1 (Photo Detector PD1L/R)”, p. 57*
- 2 Print image sensor (upper CIS assembly)  
 → *Section 9.3.2 “Removing CIS Assembly”, p. 47*
- 3 Magnetic sensor MRS  
 → *Section 9.3.3 “Removing Circuit Board MRS with Magnetic Sensor”, p. 50*
- 4 Thickness sensor THS  
 → *Section 9.3.4 “Removing Thickness Sensor THS and Circuit Board H”, p. 51*  
 12 mechanical channels from machine serial number T01xxxxx up to T11xxxxx.  
 19 mechanical channels starting with serial number M0300001 and HW Rel. 3.0.
- 5 Magnetic sensor MT  
 → *Section 9.3.5 “Removing Magnetic Sensors MT”, p. 54*
- 6 Ultraviolet sensor and photo detector (PD2) with circuit board TUV  
 → *Section 9.3.6 “Removing Circuit Board TUV (Photo Detector PD2)”, p. 56*
- 7 Ultraviolet sensor (circuit board TRU - 2-UV channel) (for serial number T1102061 to T1102079, T1102727 and higher as well as for M0300001 and higher)  
 → *Section 9.3.7 “Removing Circuit Board TRU”, p. 57*

## Overview Sensors and Detectors Back View



**Figure 11: Sensors and Detectors, Top Module Circuit Boards Removed**

- 1 Photo detector PD1L/PD1R (circuit board TT0/TT1)  
 → *Section 9.3.8 “Removing Circuit Board TT0/TT1 (Photo Detector PD1L/R)”, p. 57*
- 2 Print image sensor (CIS assembly upper)  
 → *Section 9.3.2 “Removing CIS Assembly”, p. 47*
- 3 Magnetic sensor MRS  
 → *Section 9.3.3 “Removing Circuit Board MRS with Magnetic Sensor”, p. 50*
- 4 Thickness sensor THS  
 → *Section 9.3.4 “Removing Thickness Sensor THS and Circuit Board H”, p. 51*  
 12 mechanical channels from machine serial number T01xxxxx up to T11xxxxx.  
 19 mechanical channels starting with serial number M0300001 and HW Rel. 3.0
- 5 Magnetic sensor MT  
 → *Section 9.3.5 “Removing Magnetic Sensors MT”, p. 54*

- 6 Ultraviolet sensor and photo detector (PD2) with circuit board TUV  
 → *Section 9.3.6 “Removing Circuit Board TUV (Photo Detector PD2)”, p. 56*
- 7 Ultraviolet sensor (circuit board TRU - 2-UV channel) (for serial number T1102061 to T1102079, T1102727 and higher as well as for M0300001 and higher)  
 → *Section 9.3.7 “Removing Circuit Board TRU”, p. 57*

### 9.3.1 Preparatory Work - Removing Fixing Bracket

Remove fixing bracket with circuit boards S and IO to replace the sensors, detectors, and associated circuit boards.

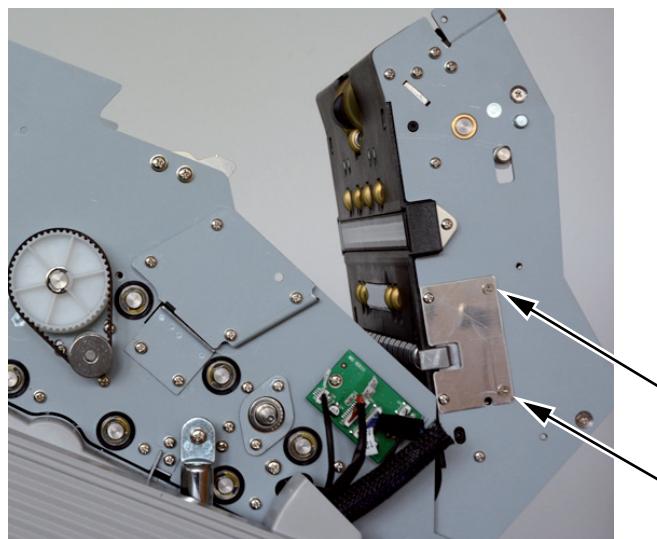
#### Requirements

- Cover of top has been removed.  
 → *Section 7.1 “Removing the Top Cover”, p. 25*
- Circuit board A has been removed.  
 → *Section 9.1.1 “Removing Circuit Board A”, p. 36*
- Plug connections on board S have been disconnected.
- Plug connections on board IO have been disconnected.

#### Removing Fixing Bracket

- [1] Open the top module.

#### Removing Screws

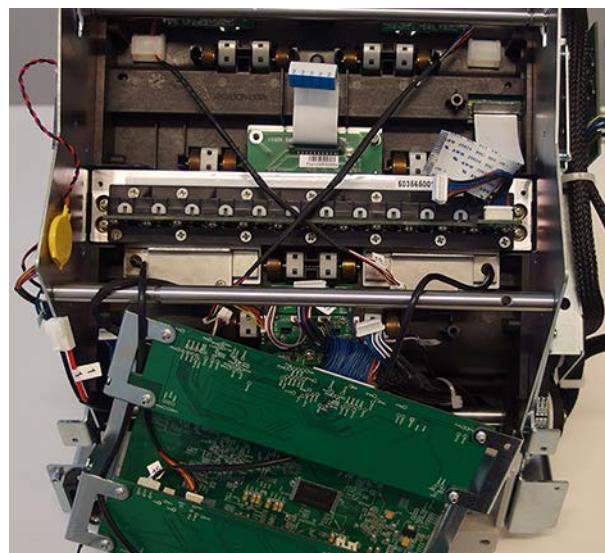


- [2] Remove the two screws (pan head M3x6) on the right side.

## Removing Screws



[3] Remove the two screws (round head M3x6 self-tapping).



[4] Fold the fixing bracket with circuit boards forwards.

⇒ The sensors and associated circuit boards are accessible.

### 9.3.2 Removing CIS Assembly

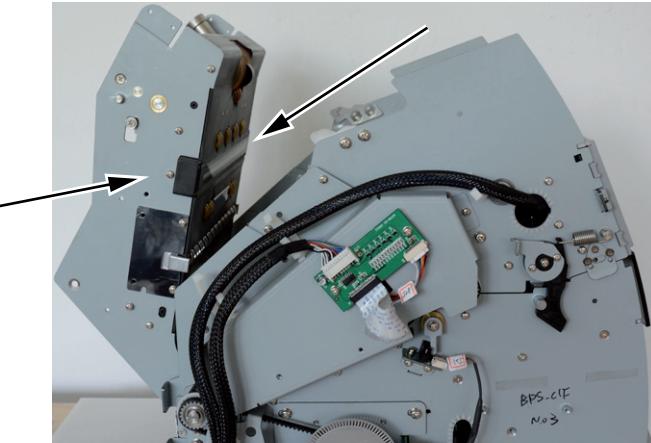
#### Requirements

- Cover of top has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*
- Cover of the middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Circuit board A, S, and IO have been removed.  
→ *Section 9.1 "Removing Circuit Board A, S, and IO", p. 35*
- Fixing bracket with board S and IO is unfolded.  
→ *Section 9.3.1 "Preparatory Work - Removing Fixing Bracket", p. 46*

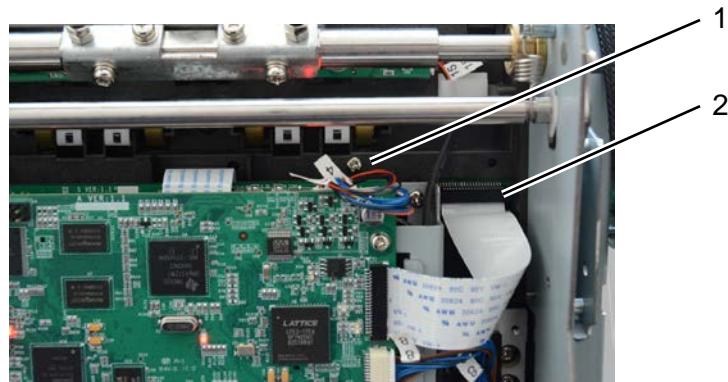
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## Removing Screws



- [1] Remove the screw (3x8 round head self-tapping) on left side.
- [2] Loosen screw (3x8 round head self-tapping) on the right side.



- [3] Remove the screw (1) (2,6x6 round head self-tapping) from CIS assembly back.

## Disconnecting Flat Cable

- [4] Disconnect the flat cable from CIS (2).

## Removing CIS Assembly

**Important!**

Securing plate of CIS assembly is not screwed and may fall down in the machine.



- [5] Remove the CIS assembly.

⇒ CIS assembly is removed.



Figure 12: CIS Assembly

**Important!**

Do not remove the adhesive strip left used for self calibration.

## Installation

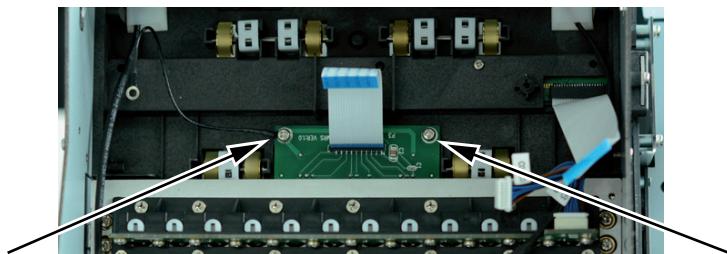
- [6] First tighten back screw.  
[7] Second firmly tighten screws of side parts.  
[8] Connect the flat cable of the CIS assembly.

### 9.3.3 Removing Circuit Board MRS with Magnetic Sensor

#### Requirements

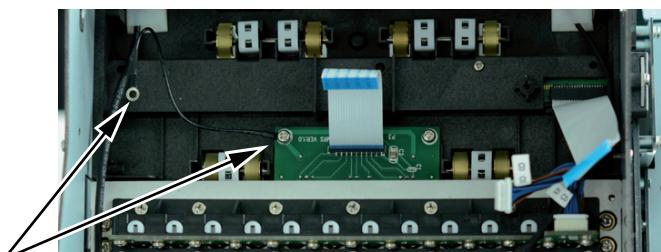
- Cover of top has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*
- Circuit board A, S, and IO have been removed.  
→ *Section 9.1 "Removing Circuit Board A, S, and IO", p. 35*
- Plug connections on board S have been disconnected.
- Plug connections on board IO have been disconnected.
- Fixing bracket with board S and IO is unfolded.  
→ *Section 9.3.1 "Preparatory Work - Removing Fixing Bracket", p. 46*

#### Removing Screws



- [1] Remove the screws (M3x6 with spring washer) of circuit board MRS.

#### Removing Ground Cable



- [2] Remove the ground cable.

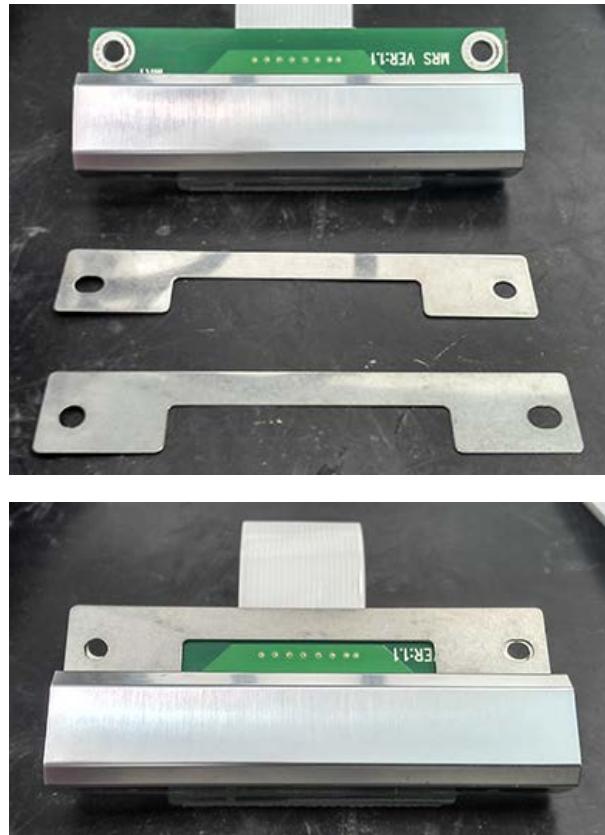
#### Removing Circuit Board MRS

- [3] Remove the circuit board with the sensor.  
⇒ Circuit board MRS with sensor is removed.



Figure 13: Sensor MRS with Board

## Installation



- [4]** The sensor MRS can have a various number of spacers inserted.  
 Ensure that all spacers are replaced before installing the circuit board.

9

### 9.3.4 Removing Thickness Sensor THS and Circuit Board H

Different types of thickness sensor THS are used for the BPS C1.

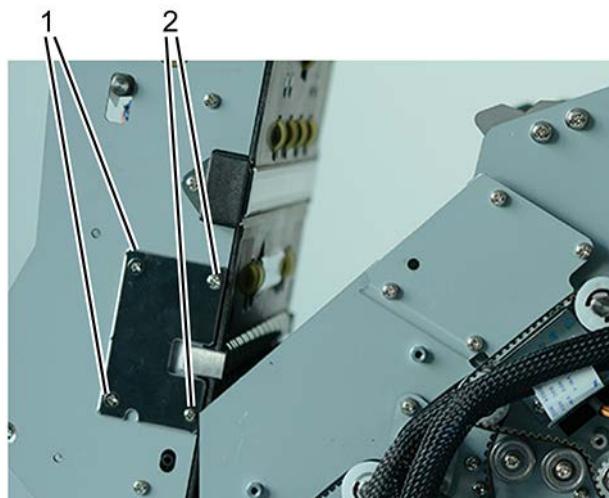
- 12 mechanical channels from machine serial number T01xxxx up to T11xxxx
- 19 mechanical channels starting with serial number M0300001 and HW Rel. 3.0

The procedure is the same for 12- and 19-channel sensors. In the following procedure, the 12-channel thickness sensor is used as example.

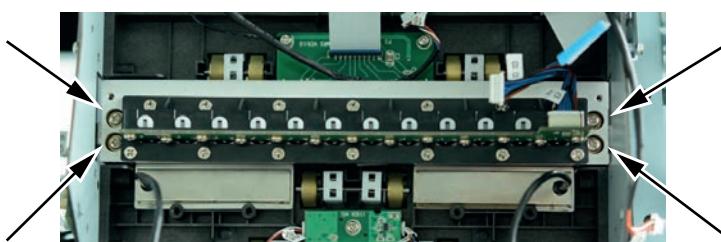
## Requirements

- Cover of top has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*
- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Circuit board A, S, and IO have been removed.  
→ *Section 9.1 "Removing Circuit Board A, S, and IO", p. 35*
- Plug connections on board S have been disconnected.
- Plug connections on board IO have been disconnected.
- Fixing bracket with board S and IO is unfolded.  
→ *Section 9.3.1 "Preparatory Work - Removing Fixing Bracket", p. 46*

## Removing Screws



- [1]** Remove on both sides of the machine.
- Two screws (pan head M3x8) (1)
  - Two screws (round head 3x8 self-tapping) (2)



- [2]** Remove the four screws (M3x18) on the thickness sensor.

## Removing Thickness Sensor

**Important!**

Take care of spring and spacers falling out by removing the thickness sensor.

- [3] Remove the thickness sensor that is connected with circuit board H.

## Separating Circuit Board H



- [4] Remove 13 screws (3x8 round head self-tapping) to separate circuit board H.  
⇒ Circuit board H with black plastic isolator is separated from thickness sensor.

## Installation

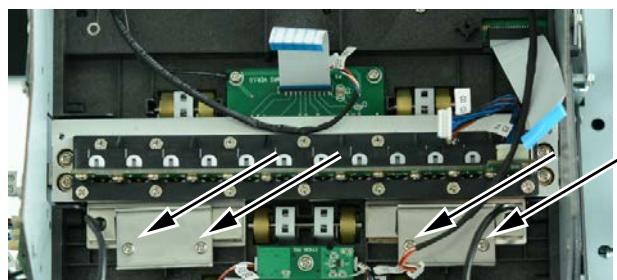
- [5] Replace plastic isolator before installing circuit board.  
[6] Install circuit board with components and marking visible.  
[7] Replace the sensor by tightening the screws on the left and right side.  
[8] Calibrate sensor.

### 9.3.5 Removing Magnetic Sensors MT

#### Requirements

- Cover of top module has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*
- Circuit board A, S, and IO have been removed.  
→ *Section 9.1 "Removing Circuit Board A, S, and IO", p. 35*
- Plug connections on board S have been disconnected.
- Plug connections on board IO have been disconnected.
- Fixing bracket with board S and IO is unfolded.  
→ *Section 9.3.1 "Preparatory Work - Removing Fixing Bracket", p. 46*

#### Removing Screws



- [1] Remove the screws (3x8 round head self-tapping) of the sensor fastening plate with foam spacer left or right.

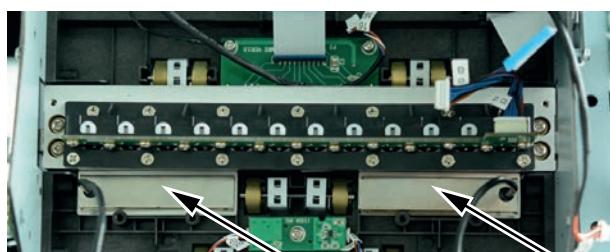
#### Removing Magnetic Sensor MT

9



#### Important!

Pay attention on the different number of spacers for magnetic sensor left or right.

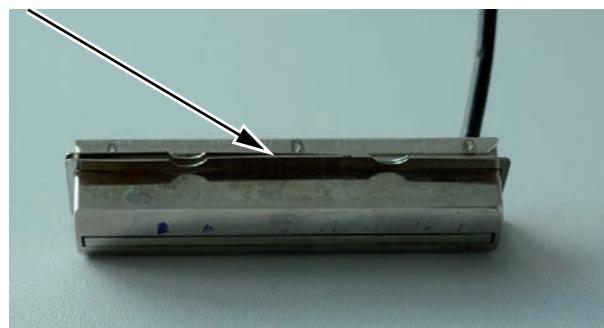
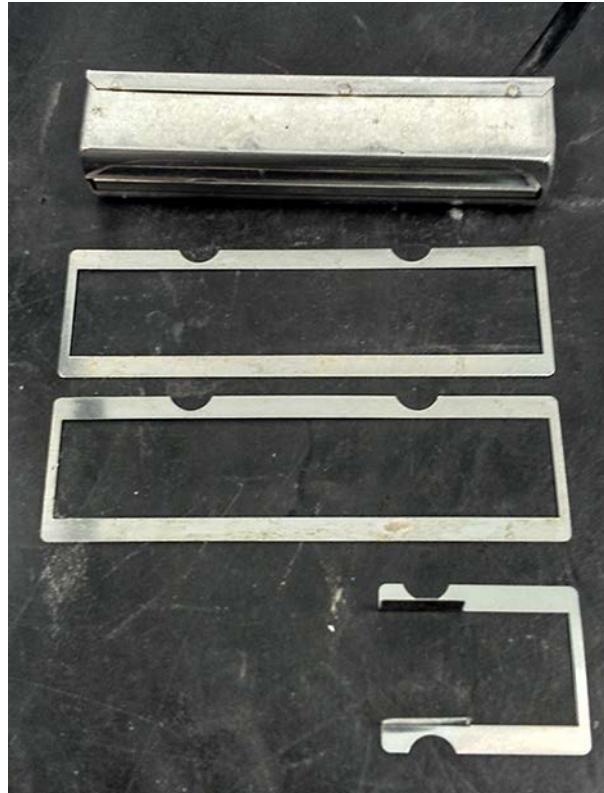


- [2] Remove the magnetic sensor MT left or right.

## Installation

**Important!**

Pay attention on the number of spacers that are used before removal.



9

- [3] Insert the same number of sensor spacers as used before removal.
- [4] Ensure that the wire of sensor is facing outwards.
- [5] Ensure the sensor fits firm on the base.

## Installation

- [6] Adjust sensor height.

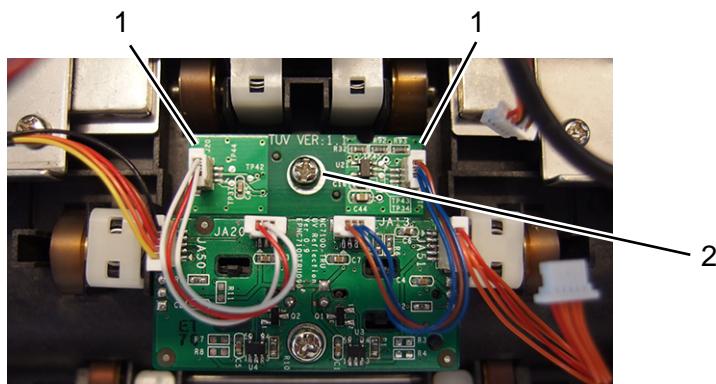
→ *Section 14.5 "Adjusting Magnetic Sensor MT or MRS", p. 140*

### 9.3.6 Removing Circuit Board TUV (Photo Detector PD2)

#### Requirements

- Cover of top and middle module has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*
- Circuit board A, S, and IO have been removed.  
→ *Section 9.1 "Removing Circuit Board A, S, and IO", p. 35*
- Plug connections on board S have been disconnected.
- Plug connections on board IO have been disconnected.
- Fixing bracket with board S and IO is unfolded.  
→ *Section 9.3.1 "Preparatory Work - Removing Fixing Bracket", p. 46.*

#### Removing Circuit Board TUV



- [1] Disconnect the two plug (1) connections.  
 [2] Remove the screw (3x8 self-tapping) (2).  
 ⇒ Circuit board TUV is removed.

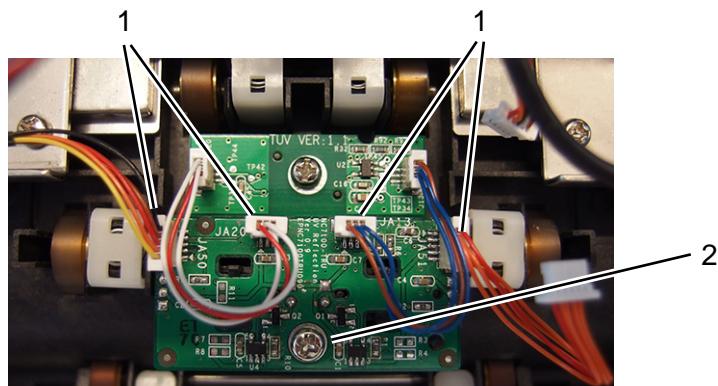
### 9.3.7 Removing Circuit Board TRU

Requirements

- Cover of top module has been removed.  
→ *Section 7.1 “Removing the Top Cover”, p. 25*
- Circuit board A, S, and IO have been removed.  
→ *Section 9.1 “Removing Circuit Board A, S, and IO”, p. 35*
- Plug connections on board S have been disconnected.
- Plug connections on board IO have been disconnected.
- Fixing bracket with board S and IO is unfolded.  
→ *Section 9.3.1 “Preparatory Work - Removing Fixing Bracket”, p. 46*

Circuit board TRU is available with serial number T1102061 to T1102079, T1102727, and higher as well as for M0300001 and higher.

Removing Circuit Board TRU



- [1] Disconnect the four plug (1) connections.
- [2] Remove the screw (3x8 self-tapping) (2).
- ⇒ Circuit board TRU is removed.

9

### 9.3.8 Removing Circuit Board TT0/TT1 (Photo Detector PD1L/R)

Requirement

Cover of top module has been removed.

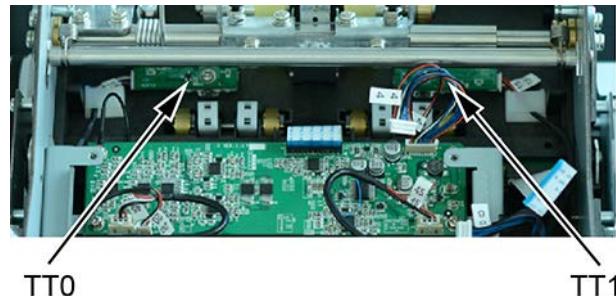
→ *Section 7.1 “Removing the Top Cover”, p. 25*

Removing Circuit Board TT0/TT1

- [1] Close the top module to reach the screws behind the shaft more easily.

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- [2] Remove the screw (3x8 self-tapping) on the left or right circuit board.
- [3] Disconnect the plug connection.  
⇒ Circuit board TT0 or TT1 is removed.

#### Installation

- [4] Ensure that the wire of detector is facing outwards.

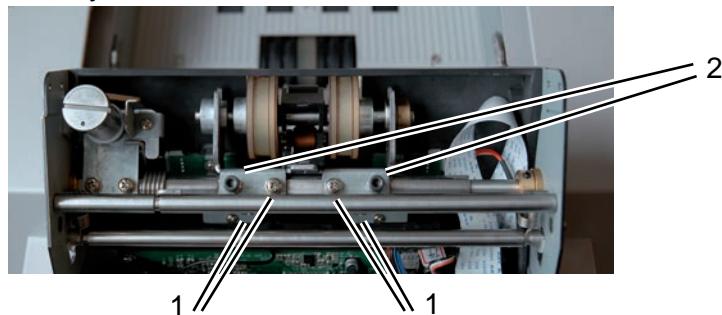
## 9.4 Removing Retarding Wheel Assembly

Requirement Cover of top module has been removed.

→ *Section 7.1 "Removing the Top Cover", p. 25*

#### Removing Retarding Wheel Assembly

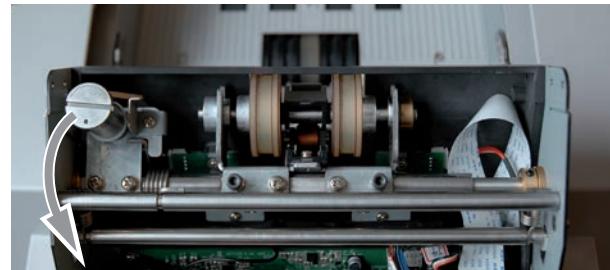
9



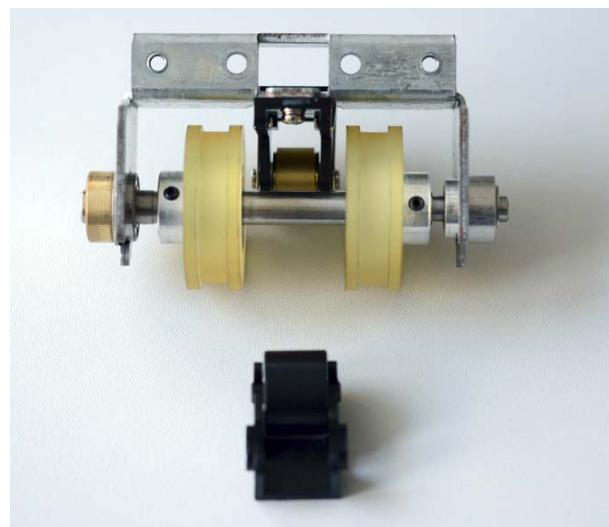
- [1] Remove the four screws (M4x10 with spring washer) (1).

#### Removing Screws

- [2] Remove both Allen screws (2).



- [3] Pull the pressure adjusting screw backwards.



- [4] Remove the retardating wheel assembly.

#### Installation

- [5] First replace the upper screws (1).
- [6] Second replace the two screws on the back (1).
- [7] Replace Allen screws (2).
- [8] Ensure the roller only moving upwards.
- [9] Ensure the roller not moving right or left.
- [10] Adjust the singler.  
 → *Section 14.1 “Adjusting the Singler Gap”, p. 135*

9

## 9.5 Removing Pinch Roller

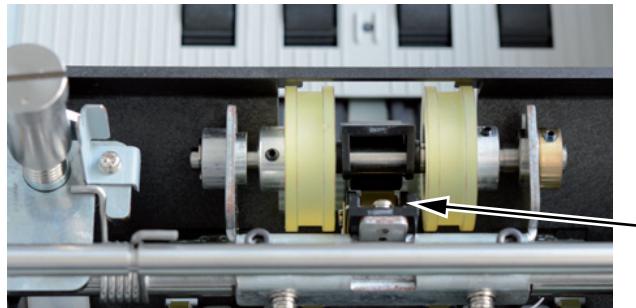
The pinch roller is connected with the retardating wheel assembly.

#### Requirement

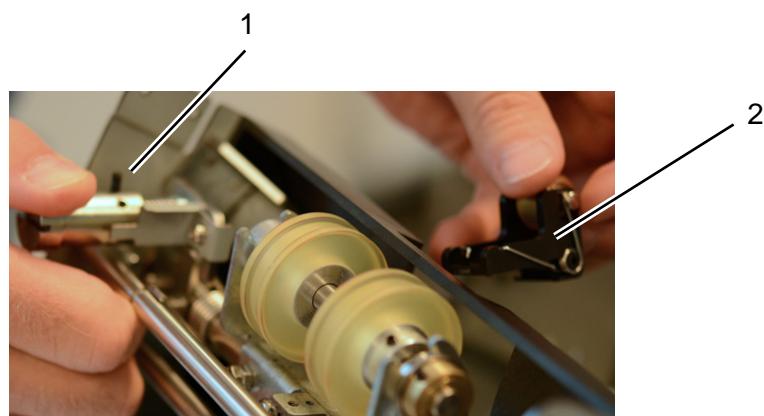
Cover of top module has been removed.

→ *Section 7.1 “Removing the Top Cover”, p. 25*

## Removing Pinch Roller



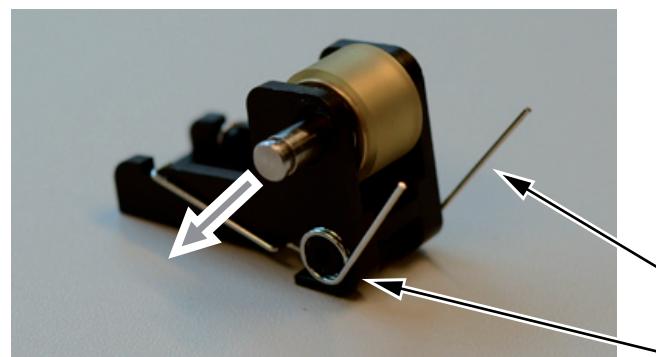
- [1] Remove the screw (round head M3x6 with spring washer).



- [2] Lift slightly the axle by using the pressure adjusting screw (1).

## 9 Removing Bracket

- [3] Remove the bracket with pinch roller (2).



- [4] Unhook both springs right and left.

- [5] Slide the axle to one side.

- [6] Remove the pinch roller.

## 9.6 Removing Transport/Passive Rollers

Several transport/passive rollers with different diameters and various springs can be replaced.

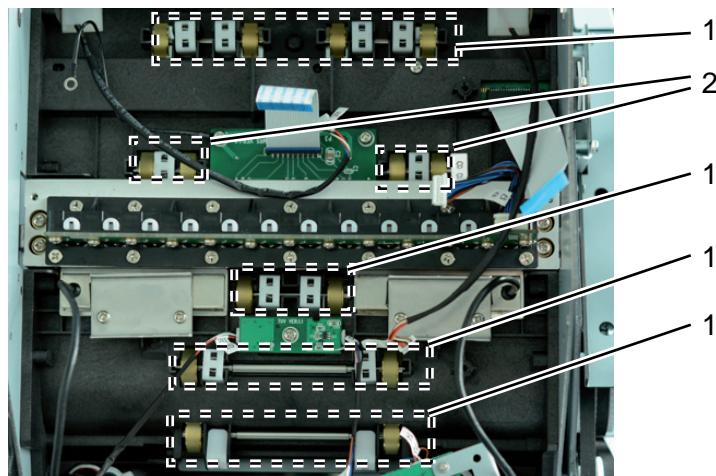


Figure 14: Transport/Passive Rollers - Position

- 1 Spring kit type A (normal tension)
- 2 Spring kit type B (high tension)

Requirement

Cover of top module has been removed.

→ *Section 7.1 "Removing the Top Cover", p. 25*

Removing Rollers

- [1] Unclip the back spring cap with fine screwdriver.
  - [2] Remove the spring cap of appropriate roller from the back side. Take care of spring falling down.
- ⇒ The roller and the spring cap are removed. Example see figure below.



Figure 15: Passive Roller Assembly - 29 mm and Spring Caps

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## 10 Parts Replacement in Middle Module

The following chapter you will find the parts replacement in the middle module.

### 10.1 Preparatory Work - Removing the Belt Guard

The belt guard is located on the left side of the machine.

Remove the belt guard for the following works:

- → *Section 10.5 “Removing CIS Assembly (Print Image Sensor) and Light Guide”, p. 69*
- → *Section 10.3 “Removing Singler Plate and Circuit Board FFT”, p. 66*
- → *Section 10.7 “Removing Feeder Roller Assembly”, p. 73*
- → *Section 10.8 “Removing Conveying Roller (Drive Roller) ”, p. 75*
- → *Section 10.9 “Removing Circuit Board MUV”, p. 80*
- → *Section 10.13 “Removing Singler Motor”, p. 84*

Requirements

Left cover of middle module has been removed.

→ *Section 7.2 “Removing the Middle Cover”, p. 25*



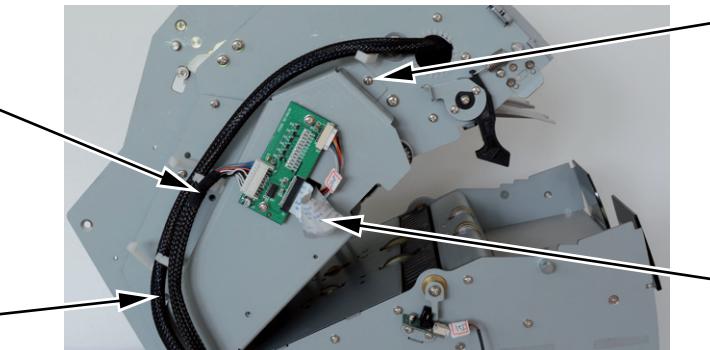
#### Important!

→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*

Removing the Belt Guard

- [1] Disconnect all plug connections.
- [2] Remove the cable ties.

10



- [3] Remove the four screws (round head M3x6 with spring washer).
- [4] Remove the belt guard.

## 10.2 Operating Unit

The operating unit includes the following replacement parts.

- TFT LCD panel
- UI keys right
- UI keys left
- UI bracket
- Circuit board FFT (photo detector PDMSI)
- Circuit board UI

Requirements

Cover of middle module has been removed.

→ *Section 7.2 “Removing the Middle Cover”, p. 25*



### Important!

→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*

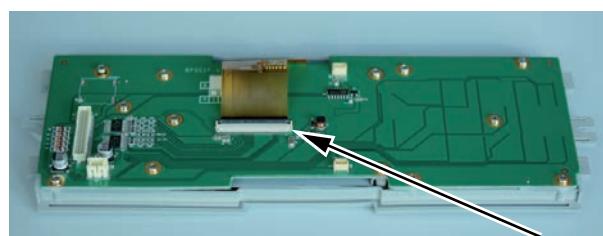
#### Removing Operating Unit

- [1] Open the top module.
- [2] Remove on screw on each side (pan head M3x6).
- [3] Remove guide plate.



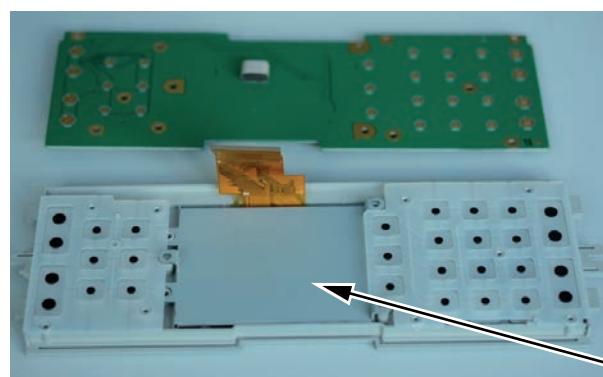
- [4] Remove the screws (pan head M3x6) on both sides of the operating unit.
- [5] Fold the operating unit forward.
- [6] Disconnect the plug connections to the photo detector on the back.
- [7] Remove the operating unit.

#### Removing Circuit Board UI



- [1] Disconnect the flat cable by lifting upward the securing clip of the plug connection.
  - [2] Remove all screws (round head 2,6x6 self-tapping) of the circuit board UI at the rear of the operating unit.
- ⇒ The circuit board and the UI bracket are separated.

#### Removing the TFT LCD panel



- [1] Remove the back plate that is bonded with double-sided adhesive tape.

10

- [2] Remove the TFT LCD panel.

Installation

- [3] Ensure that the cable of the TFT LCD panel is routed downwards.

Removing Keys from UI Bracket

- [1] Remove the silicon membrane.  
[2] Remove the keys from the UI bracket.

Installation

- [3] Separate the cast parts from the casting framework.  
[4] Ensure that all keys are moving smoothly. If necessary, deburr the keys.

### 10.3 Removing Singler Plate and Circuit Board FFT

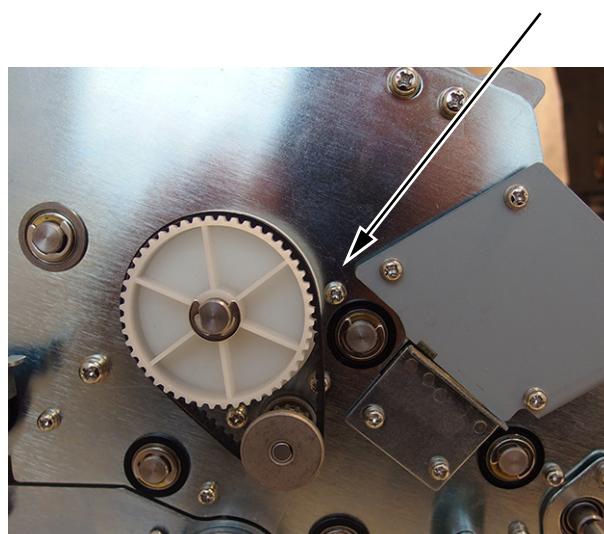
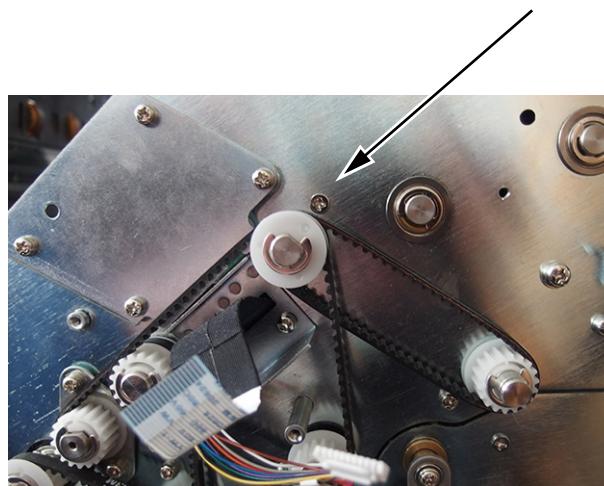
Requirement

- Belt guard has been removed.  
→ *Section 10.1 “Preparatory Work - Removing the Belt Guard”, p. 63*
- Operating unit has been removed.  
→ *“Removing Operating Unit”, p. 64.*



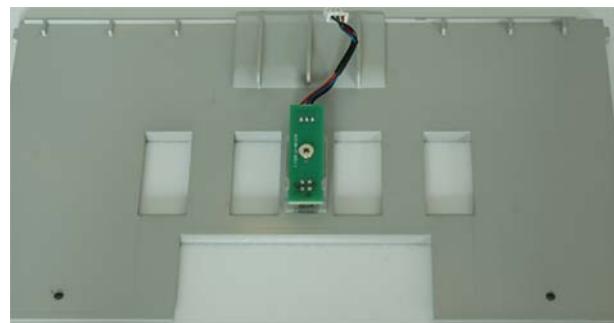
#### Important!

→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*



10

- [1] Remove one screw (round head M3x6 self-tapping) on each side.
- [2] Lift and slide the singler plate forward.
- [3] Pull out the singler plate.



- [4] Remove the screw (pan head M3x5) of the circuit board FFT at the back of the singler plate.  
 ⇒ The singler plate and the circuit board are separated.

## 10.4 Removing Circuit Board CIS

The circuit board CIS is on the left side of the machine.

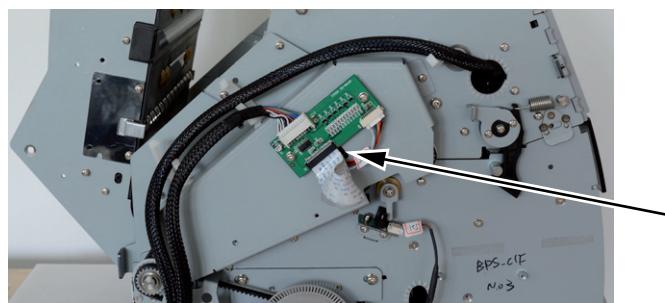


Figure 16: Circuit Board CIS - Position

Requirements

Left cover of middle module has been removed.

→ Section 7.2 “Removing the Middle Cover”, p. 25



### Important!

→ Chapter 6 “Prerequisites for Parts Replacement”, p. 23

Removing Circuit Board CIS

- [1] Disconnect all plug connections.
- [2] Remove the two screws (M3x6 round head with spring washer) on the circuit board.
- [3] Remove the circuit board CIS.

## 10.5 Removing CIS Assembly (Print Image Sensor) and Light Guide

### Requirement

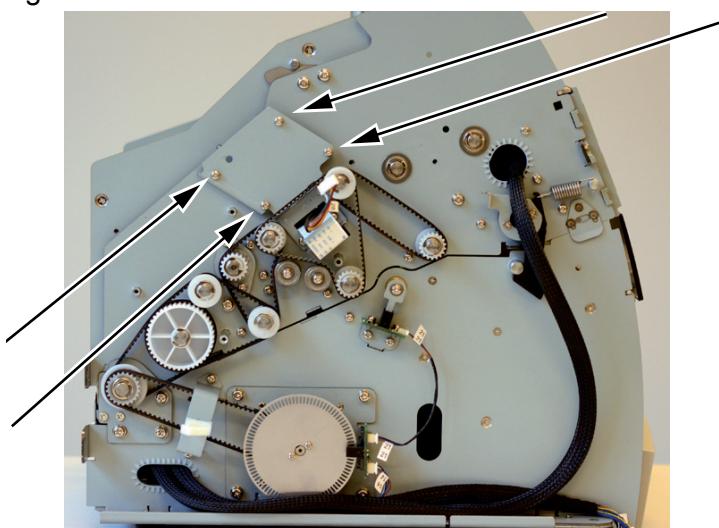
- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Belt guard has been removed.  
→ *Section 10.1 "Preparatory Work - Removing the Belt Guard", p. 63*
- Singler plate has been removed.  
→ *Section 10.3 "Removing Singler Plate and Circuit Board FFT", p. 66*



### Important!

→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

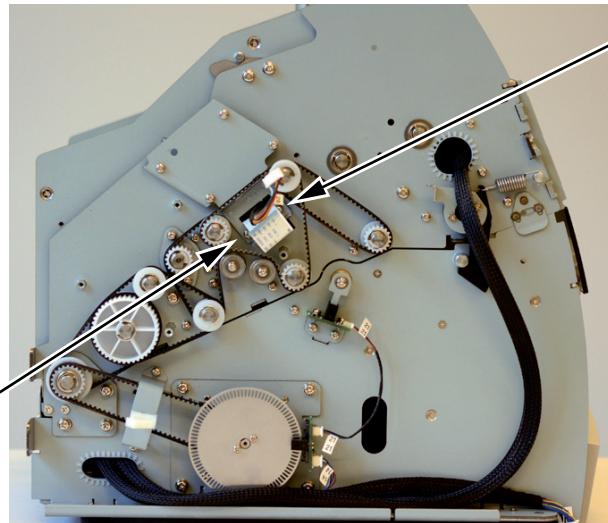
### Removing CIS Assembly and Light Guide



10

- [1] Remove the four screws (round head M3x6 with spring washer) on the fixing brackets on both sides of the machine.

## Removing Screws



- [2] Remove the two screws (M3x6 round head with spring washer) on the sensor cable routing bracket on the left side of the machine.

**Important!**

Pull out the sensor CIS and the light guide simultaneously because of the linked cable.

- [3] Pull out the sensor CIS and the light guide to the left by lifting carefully.  
 ⇒ The sensor CIS and the light guide are removed.



Figure 17: CIS Assembly

**Important!**

Do not remove the black adhesive strip on the sensor that is used for self calibration.

## 10.6 Removing Kicker Roller Module

The kicker roller module is at the top of the middle module behind the singler plate.

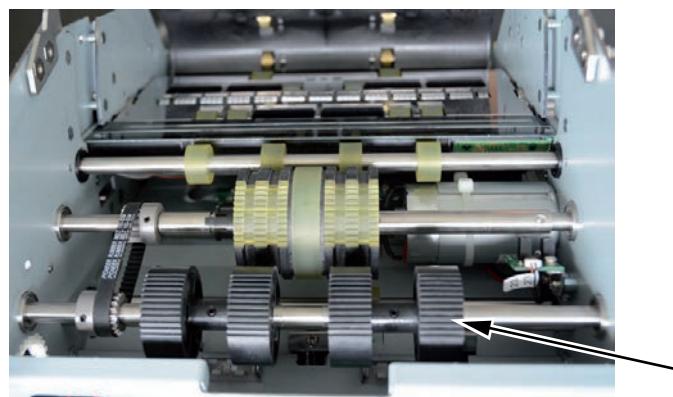


Figure 18: Kicker Roller Module - Position

#### Requirements

- Cover of middle module has been removed.  
→ *Section 7.2 “Removing the Middle Cover”, p. 25*
- Operating unit has been removed.  
→ *Section 10.2 “Operating Unit”, p. 64*
- Singler plate has been removed.  
→ *Section 10.3 “Removing Singler Plate and Circuit Board FFT”, p. 66*

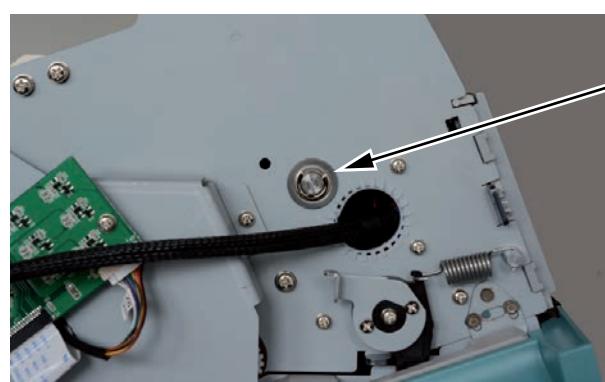


#### Important!

→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*

#### Removing Kicker Roller Module

- [1] Open the top module.



10

- [2] Remove the circlips of the kicker roller module on both sides.

- Right side: Circlip Ø 6 mm with plain washer
- Left side: Circlip Ø 6 mm



[3] Detach the toothed belt from the kicker roller module.

#### Removing Kicker Roller Module



[4] Remove the kicker roller module to the right side.

#### Removing Screw



[5] Loosen the set screw (M3x6) on the ring gear using Allen key 1/16".

[6] Remove the ring gear.

## Installation

- [7] Before replacing the assembly insert toothed belt A.
- [8] Adjust the roller after the installation.  
→ *Section 14.2 "Adjusting Feeder Roller Kicker Roller Ratio", p. 137*

## 10.7 Removing Feeder Roller Assembly

The feeder roller assembly is at the top of the middle module behind the singler plate.

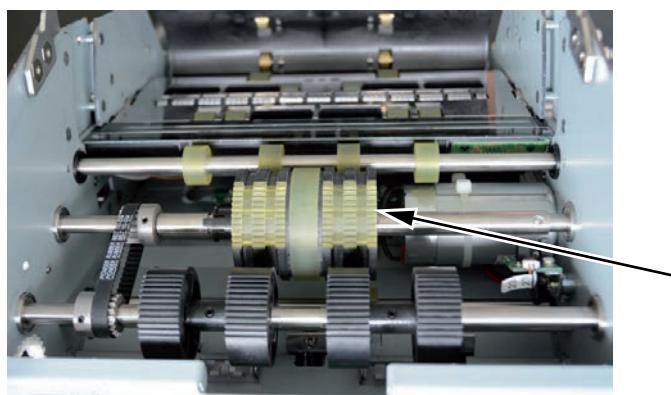


Figure 19: Feeder Roller Assembly - Position

### Requirements

- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25.*
- Belt guard has been removed.  
→ *Section 10.1 "Preparatory Work - Removing the Belt Guard", p. 63*
- Operating unit has been removed.  
→ *Section 10.2 "Operating Unit", p. 64*
- Singler plate has been removed.  
→ *Section 10.2 "Operating Unit", p. 64*

10

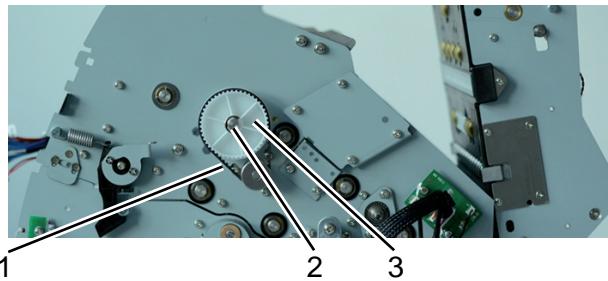


### Important!

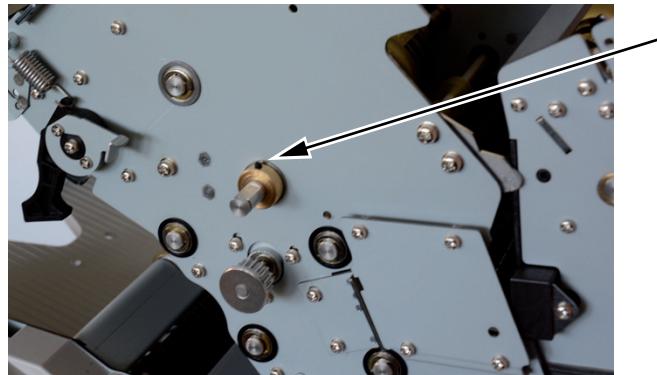
→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

### Removing Feeder Roller Assembly

- [1] Open the top module.



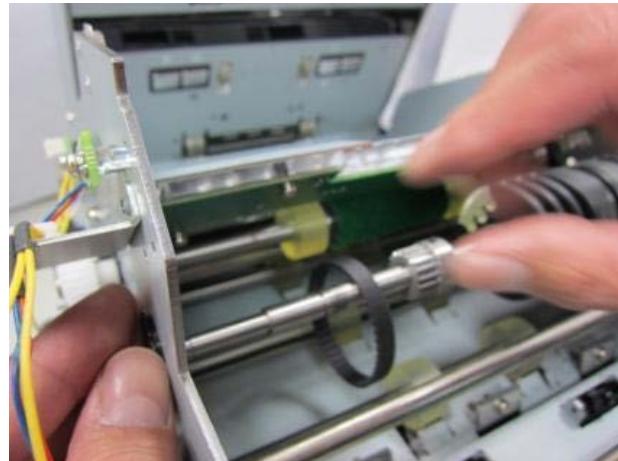
- [2] Remove toothed belt H (1) on the right side.
- [3] Remove the circlip ( $\varnothing$  6 mm) (2) on the right side.
- Removing Toothed Belt Wheel**
- [4] Remove the toothed belt wheel (3) on the right side.



- [5] Remove the set screw (M3x6) from bearing ring on the right side.
- [6] Remove the bearing ring.
- [7] Remove the circlip ( $\varnothing$  6 mm) on the left side.


**Important!**

Take care not to damage the photo detector units with the pin of the axle.



- [8] Move the feeder roller assembly to the right and remove the assembly.  
 ⇒ The feeder roller assembly and the toothed belt A (153/6 mm) are removed.



10

Figure 20: Feeder Roller Assembly and Toothed Belt A (153/6 mm)  
 (Example)

**Installation**

- [9] Before replacing the assembly insert toothed belt A.  
 [10] Adjust the roller after the installation.  
 → *Section 14.2 “Adjusting Feeder Roller Kicker Roller Ratio”, p. 137*

## 10.8 Removing Conveying Roller (Drive Roller)

The following conveying rollers are located in the middle module:

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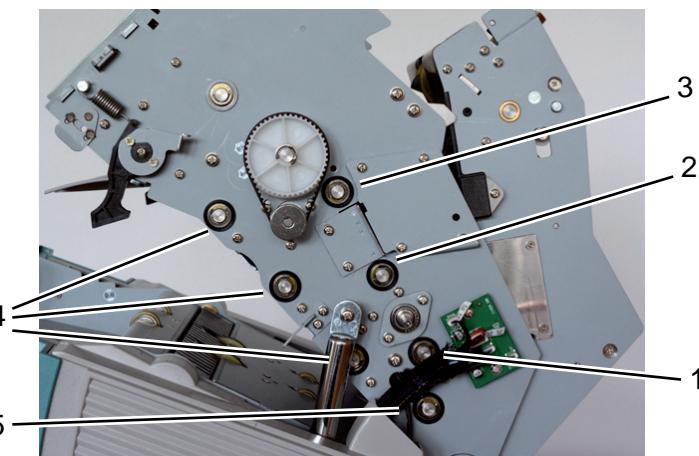


Figure 21: Conveying Rollers - Positions (Right Side)

- 1 Conveying roller MG
- 2 Conveying roller MR
- 3 Conveying roller 18x4
- 4 Conveying roller 18x2 (three times)
- 5 Conveying roller 43x2

### 10.8.1 Removing Conveying Roller MG, MR and 18x4

Requirement

- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Singler plate has been removed.  
→ *Section 10.3 "Removing Singler Plate and Circuit Board FFT", p. 66*
- Belt guard has been removed.  
→ *Section 10.1 "Preparatory Work - Removing the Belt Guard", p. 63*
- For the replacement of conveying roller MG, rear plate has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*

10



#### Important!

→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

- [1] Remove the related toothed belts.
- [2] Remove the circlip ( $\varnothing$  6 mm) of the axle on the right side.
- [3] Remove the plastic pulley wheel.
- [4] Remove the second plastic pulley wheel.

- [5] Remove the circlip on next wheel.
  - [6] Remove the conveying roller.
- ⇒ The conveying rollers are removed.

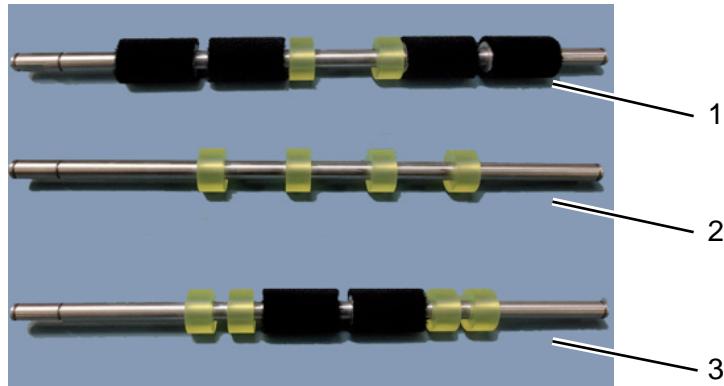


Figure 22: Conveying Roller MG, MR, 18x4

- 1 Conveying roller MG
- 2 Conveying roller 18x4
- 3 Conveying roller MR

### 10.8.2 Removing Conveying Roller 18x2

Requirement

- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Singler plate has been removed.  
→ *Section 10.3 "Removing Singler Plate and Circuit Board FFT", p. 66*
- Belt guard has been removed.  
→ *Section 10.1 "Preparatory Work - Removing the Belt Guard", p. 63*
- For the replacement of conveying roller MG, rear plate has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*

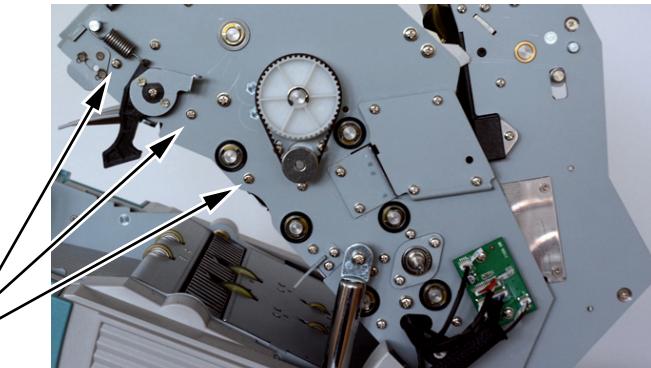
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#### Important!

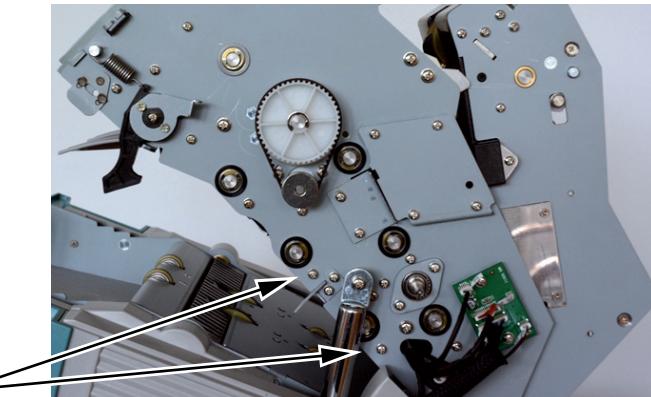
→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

## Removing Upper Top Plate



- [1] Remove three screws (round head M3x6 with spring washer) on both sides.
- [2] Remove the upper top plate of lower bill path.

## Removing Inner Top Plate



- [3] Remove two screws (round head M3x6 with spring washer) on both sides.
- [4] Remove the inner top plate of lower bill path.

## Removing Toothed Belts

- [5] Remove the related toothed belts.
- [6] Remove the circlip ( $\varnothing$  6 mm) of the axle on both sides.

## Removing Toothed Belt Wheels

- [7] Remove the related toothed belt wheels.
  - [8] Remove the conveying roller.
- ⇒ Conveying roller is removed.



Figure 23: Conveying Roller 18x2

### 10.8.3 Removing Conveying Roller 43x2

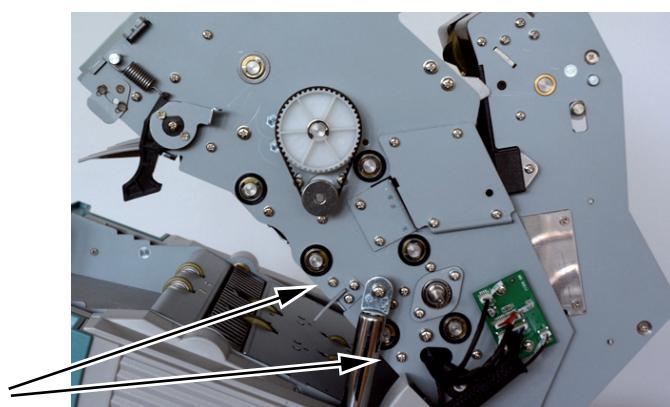
#### Requirement

- Cover of middle module has been removed.  
→ *Section 7.2 “Removing the Middle Cover”, p. 25*
- Singler plate has been removed.  
→ *Section 10.3 “Removing Singler Plate and Circuit Board FFT”, p. 66*
- Belt guard has been removed.  
→ *Section 10.1 “Preparatory Work - Removing the Belt Guard”, p. 63*
- For the replacement of conveying roller MG, rear plate has been removed.  
→ *Section 7.3 “Removing the Lower Cover”, p. 27*



#### Important!

→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*



10

- [1] Remove two screws (round head M3x6 with spring washer) on both sides.
- [2] Remove the inner top plate of lower bill path.
- [3] Remove the related toothed belts.
- [4] Remove the circlip ( $\varnothing$  6 mm) of the axle on both sides.
- [5] Remove the related toothed belt wheels.

- [6] Remove the conveying roller.  
 ⇒ Conveying roller 43x2 is removed.

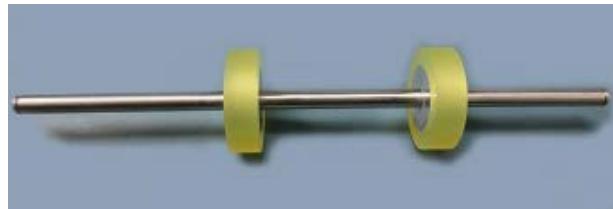


Figure 24: Conveying Roller 43x2

## 10.9 Removing Circuit Board MUV

The circuit board MUV is at the rear plate of the upper bill path.

### Requirement

- Cover of middle module has been removed.  
 → *Section 7.2 “Removing the Middle Cover”, p. 25*
- Left cover of lower module has been removed.  
 → *Section 7.3 “Removing the Lower Cover”, p. 27*
- Belt guard has been removed.  
 → *Section 10.1 “Preparatory Work - Removing the Belt Guard”, p. 63*



### Important!

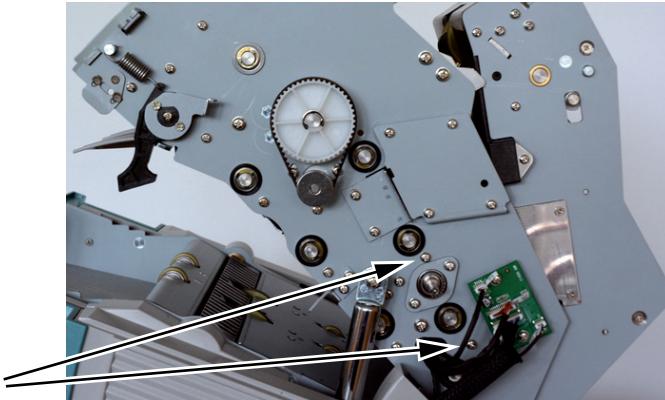
→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*

### Removing Circuit Board MUV

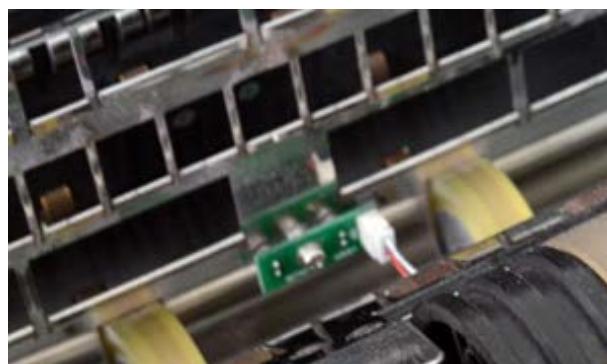
10

- [1] Remove toothed belt E (207/5 mm or 213/5 mm) and F (192/6 mm) on the left side.  
 → *Section 12.2 “Removing Toothed Belt B, C, D, E, F”, p. 124*
- [2] Remove the circlip ( $\varnothing$  6 mm) of the toothed belt wheel.
- [3] Remove the toothed belt wheels.

## Removing Screws



- [4]** Remove screws on both sides.
- Two screws (M3x6 with spring washer) on the left
  - One screw (M3x6 round head with spring washer) on the right
  - One screw (pan head) on the right



- [5]** Disconnect the plug connection.  
**[6]** Remove screw (M3x12 with spring washer).

10

## 10.10 Removing Circuit Board MFE (Photo Detector PDSI0)

The circuit board MFE is located inside the middle module on the right behind the singler plate.

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## Requirement

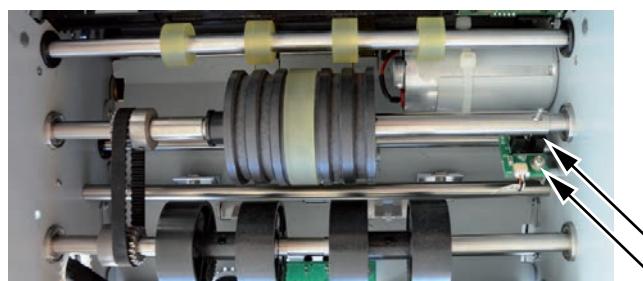
- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Operating unit has been removed.  
→ *Section 10.2 "Operating Unit", p. 64*
- Singler plate has been removed.  
→ *Section 10.3 "Removing Singler Plate and Circuit Board FFT", p. 66*

**Important!**

→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

## Removing Circuit Board MFE

- [1] Disconnect the plug connection.



- [2] Remove the two screws (M3x6 with spring washer) by using a short screwdriver cross-head.

## 10.11 Removing Circuit Board MIO (Photo Detector PDMUp)

The circuit board MIO is at the right side of the middle module.

## Requirements

Right cover of middle module has been removed.

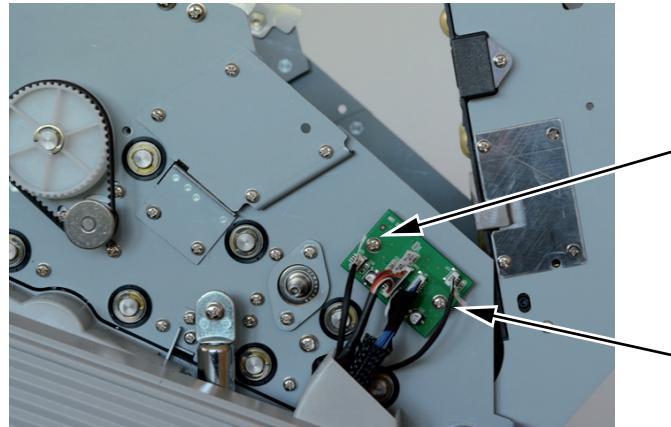
→ *Section 7.2 "Removing the Middle Cover", p. 25*

**Important!**

→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

## Removing Circuit Board MIO

- [1] Disconnect all plug connections.



- [2] Remove the two screws (round head M3x6 with spring washer).

## 10.12 Removing Circuit Board RJD (Photo Detector PDMRJ)

The circuit board RJD is at the top of the middle module.

### Requirement

- Cover of middle module has been removed.  
→ *Section 7.2 “Removing the Middle Cover”, p. 25*
- Operating unit has been removed.  
→ *“Removing Operating Unit”, p. 64*
- Singler plate has been removed.  
→ *Section 10.3 “Removing Singler Plate and Circuit Board FFT”, p. 66*



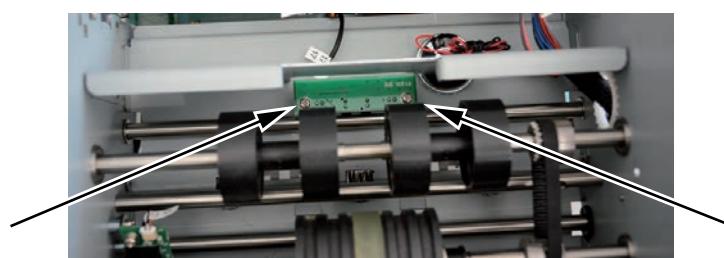
### Important!

→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*

10

### Removing Circuit Board RJD

- [1] Disconnect the plug connections to the circuit board UI.



- [2] Remove the two screws (round head M3x6 with spring washer).

## 10.13 Removing Singler Motor

The singler motor is located inside the middle module on the right behind the singler plate.

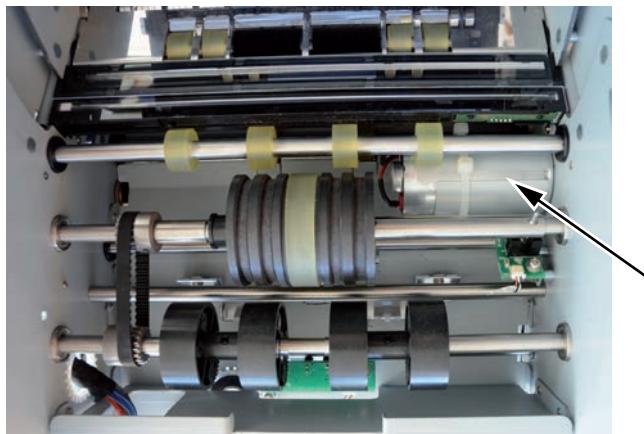


Figure 25: Singler Motor - Position

### Requirements

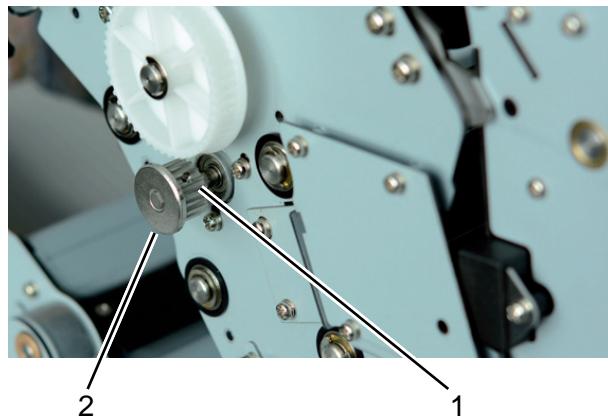
- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Cover of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Belt guard has been removed.  
→ *Section 10.1 "Preparatory Work - Removing the Belt Guard", p. 63*
- Operating unit has been removed.  
→ *Section 10.2 "Operating Unit", p. 64*
- Singler plate has been removed.  
→ *Section 10.3 "Removing Singler Plate and Circuit Board FFT", p. 66*
- Reject stacker assembly has been removed.  
→ *Section 11.2 "Removing Delivery Stacker Assembly", p. 94*
- Toothed belt H (177/5 mm) has been removed.  
→ *Section 12.4 "Removing Toothed Belt H (177/5 mm)", p. 126*
- Toothed belts B (189/6 mm) and C (228/5 mm or 222/5 mm) have been removed.  
→ *Section 12.2 "Removing Toothed Belt B, C, D, E, F", p. 124*
- Feeder roller assembly has been removed.  
→ *Section 10.7 "Removing Feeder Roller Assembly", p. 73*
- Conveying roller 18x4 has been removed.  
→ *Section 10.8 "Removing Conveying Roller (Drive Roller)", p. 75*


**Important!**

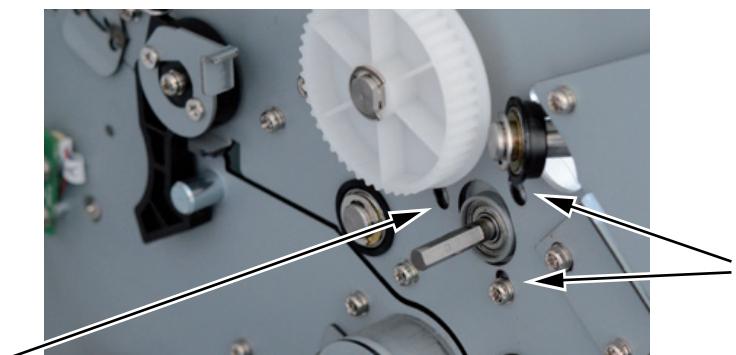
→ Chapter 6 “Prerequisites for Parts Replacement”, p. 23

**Removing Singler Motor**

- [1] Disconnect plug connection to circuit board UI.



- [2] Remove the set screw (M3x3) (1) of the belt wheel on the singler motor.  
 [3] Remove the belt wheel (2).  
 [4] Disconnect plug connection (J41) to circuit board BLD.

**Removing Screws**


- [5] Remove three screws (round head M3x6 with spring washer).

**Removing Motor**

- [6] Remove the singler motor from the top of the lower bill path.

10

## 10.14 Removing Pneumatic Spring

The pneumatic spring is on the right side of the machine.

### Requirement

- Right cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Right cover of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*



### Important!

→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

### Removing Pneumatic Spring



### CAUTION

Risk of injury from tensioned springs

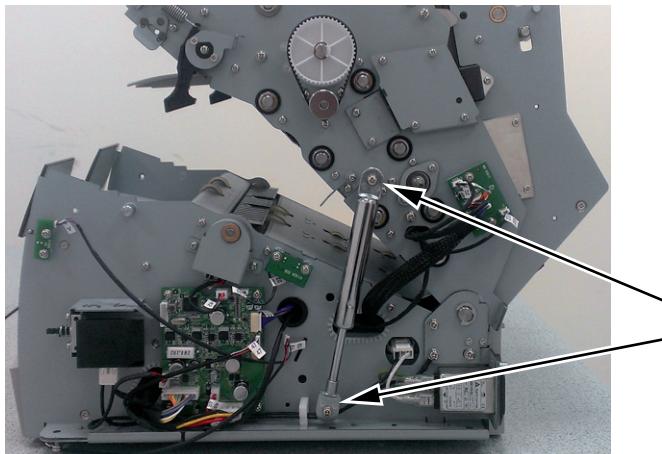
The spring can cause injuries or damage to property if the spring tension is suddenly released.

Make sure that the spring tension cannot be suddenly released.

To do so, follow the work steps of the following procedure exactly.

- [1] Open the middle module to untension the pneumatic spring.

### Removing Upper Screw



- [2] Remove the upper screw (M4x6 with spring washer) of the pneumatic spring.
- [3] When doing so, hold the middle module firmly and unclip the gas spring at the top.
- [4] Close the middle module.

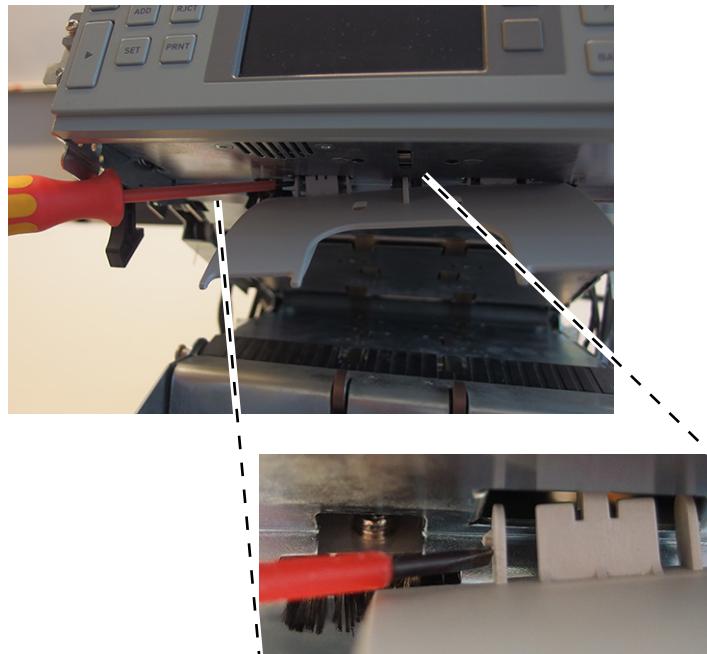
## Removing Lower Screw

- [5] Remove the lower screw (M4x6 with spring washer) of the pneumatic spring.
- [6] Remove the pneumatic spring.  
⇒ The pneumatic spring is removed.



Figure 26: Pneumatic Spring

## 10.15 Removing Reject Stacker Note Holder



- [1] Unclip note holder by using the screw driver as shown above.

## 10.16 Removing Static Brush

### Requirements

- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Operating unit has been removed.  
→ *"Removing Operating Unit", p. 64*
- Singler plate has been removed.  
→ *Section 10.3 "Removing Singler Plate and Circuit Board FFT", p. 66*



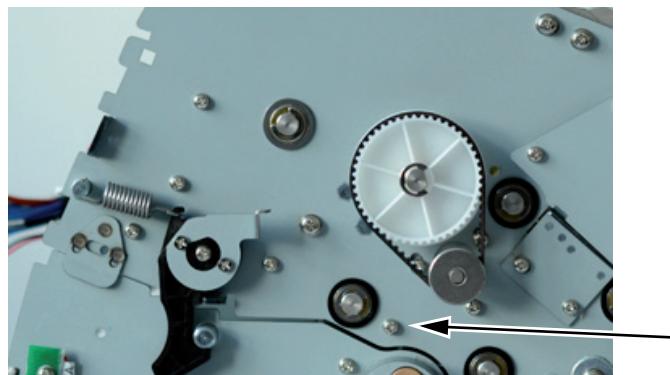
### Important!

→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

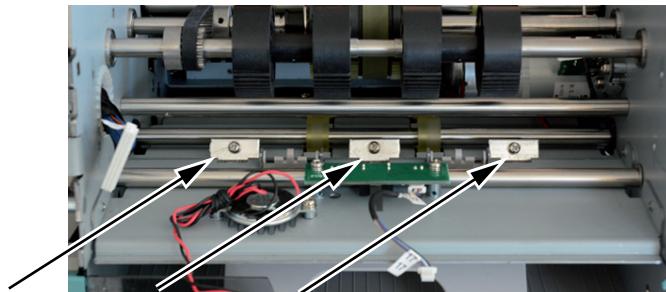
### Removing Static Brush Kit



- [1]** Remove the screws (round head M3x6 with spring washer) on both sides.



- [2]** Loosen the screw (round head M3x6 with spring washer).  
**[3]** Slide down the upper plate of lower bill path.



- [4] Remove one screw (round head M3x6 with spring washer) for each brush.

## 10.17 Removing Thickness Sensor Cleaning Assembly

### Requirements

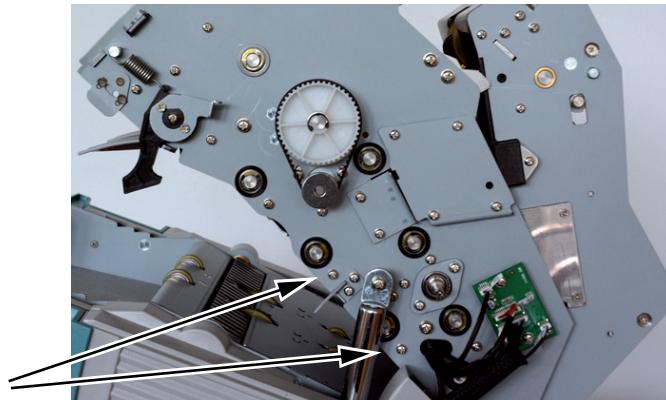
- Cover of middle module has been removed.  
→ *Section 7.2 “Removing the Middle Cover”, p. 25*
- Belt guard has been removed.  
→ *Section 10.1 “Preparatory Work - Removing the Belt Guard”, p. 63*



### Important!

→ *Chapter 6 “Prerequisites for Parts Replacement”, p. 23*

### Removing Screws



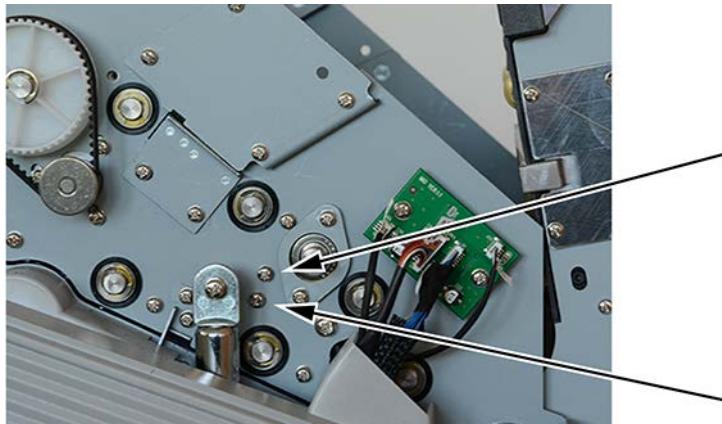
- [1] Remove two screws (round head M3x6 with spring washer) on both sides.

### Removing Top Plate

- [2] Remove the top plate of the lower bill path to get access to the cleaning assembly.

10

## Removing Screws



- [3] Remove two screws (round head M3x6) on both sides.

## Removing Thickness Sensor Cleaning Assembly

- [4] Remove carefully the cleaning assembly.

**10.18 Removing Latch Assembly**

The latches are on both sides of the middle module.

## Requirements

Cover of middle module has been removed.

→ *Section 7.2 "Removing the Middle Cover", p. 25*

**Important!**

→ *Chapter 6 "Prerequisites for Parts Replacement", p. 23*

10

## Removing Latch Assembly



- [1] Remove the screw (1) (round head M3x8 with spring washer).
- [2] Unhook the spring (2).

## Installation

- [3] Ensure the spring hook (3) is facing outwards.

## 10.19 Removing Speaker

The speaker is located behind the operating unit in the middle module.

## Requirement

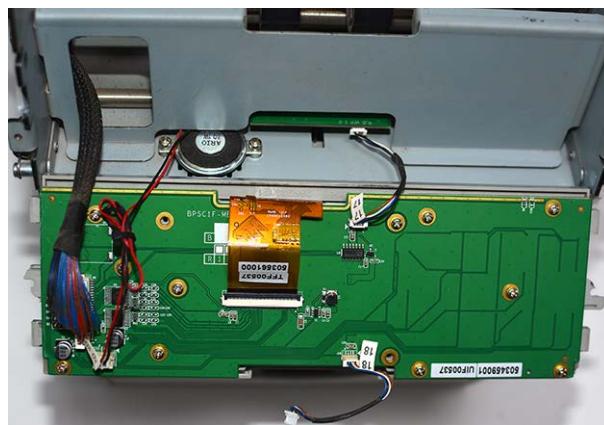
- Cover of middle module has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*

## Removing Speaker

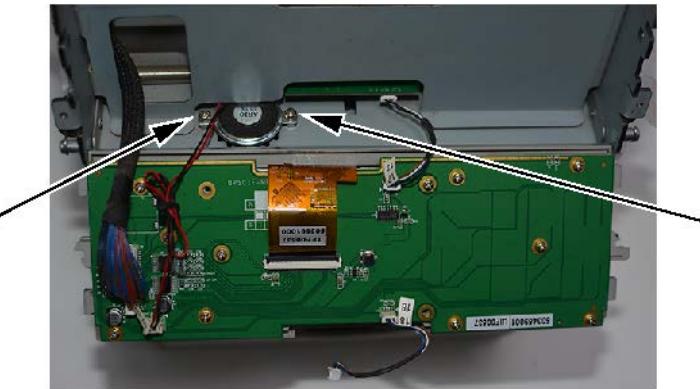
- [1] Open the top Module.
- [2] Remove one screw on each side (pan head M3x6).
- [3] Remove guide plate.



- [4] Remove the screws (pan head M3x6) on both sides of the operating unit.
- [5] Fold the operating unit forward.



- [6] Disconnect the plug connections.



- [7] Remove the screws on both sides of the speaker.  
⇒ The speaker can be removed.



Figure 27: Speaker

## 11 Parts Replacement in the Lower Module

In the following chapter you will find the parts replacement in the lower module.

### 11.1 Removing Reject Stacker Assembly

The reject stacker assembly is located in the lower module, on the front side of the machine.

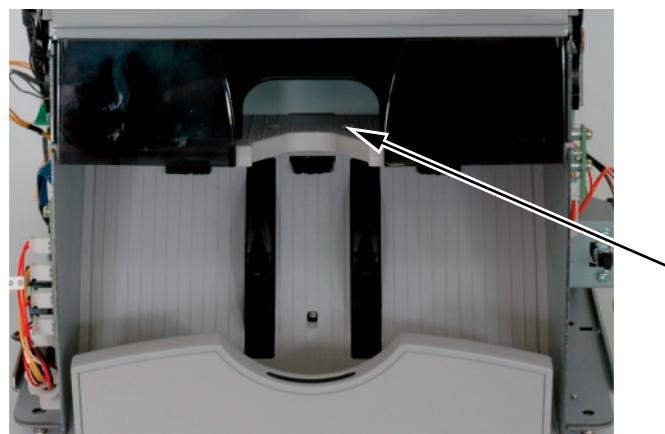


Figure 28: Reject Stacker Assembly - Position

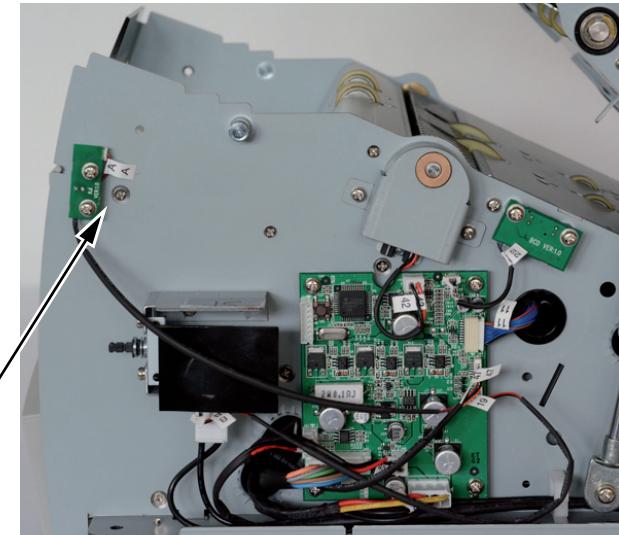
#### Requirements

Cover (left and right) of lower module has been removed.

→ Section 7.3 "Removing the Lower Cover", p. 27

#### Removing Reject Stacker Assembly

- [1] Open the middle module.



- [2] Remove screw (countersunk M3x8 self-tapping) on each side of the machine.
- [3] Lift the reject stacker assembly out.  
⇒ The reject stacker assembly is removed.

## 11.2 Removing Delivery Stacker Assembly

The delivery stacker assembly is located in the lower module, on the front side of the machine.

### Requirements

Cover (left and right) of lower module has been removed.

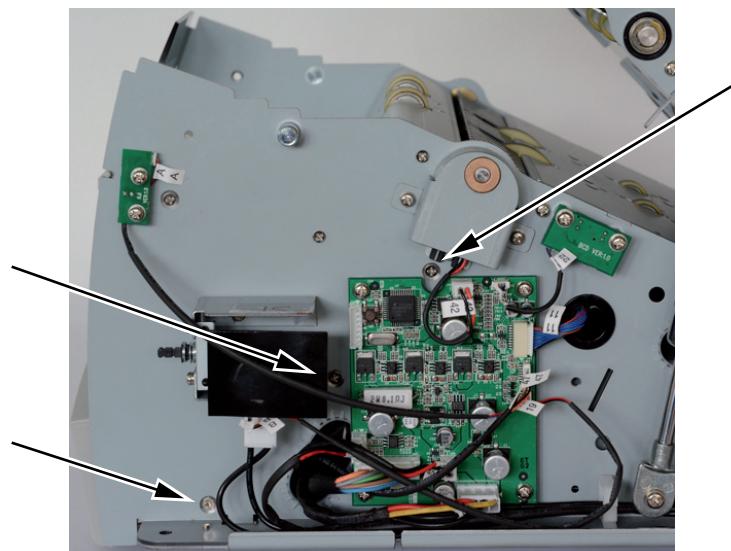
→ *Section 7.3 "Removing the Lower Cover", p. 27*

## Removing Delivery Stacker Assembly



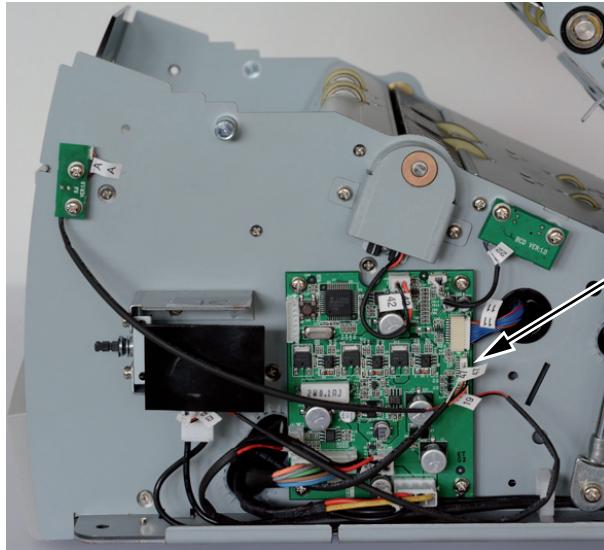
- [1]** Remove the two screws (countersunk M3x8 self-tapping) on the underside of the delivery stacker.

## Removing Screws



- [2]** Remove the three screws (countersunk M3x8 self-tapping) on both sides of the machine.

## Disconnecting Connector



- [3] Disconnect the plug connection (J47).
- [4] Pull the delivery stacker assembly slightly upwards.

**Important!**

Carefully pull out the delivery stacker assembly until you can disconnect the cable connections to the circuit board.

- [5] Pull out the delivery stacker assembly completely.  
⇒ The delivery stacker assembly is removed.

## 11.3 Removing Static Brush

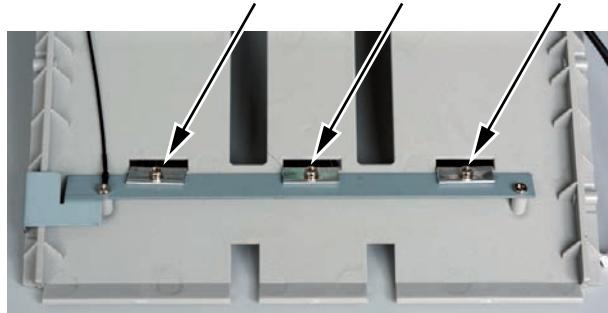
The static brushes are at the back of the delivery stacker assembly.

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### Requirements

- Cover (left and right) of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Delivery stacker assembly has been removed.  
→ *Section 11.2 "Removing Delivery Stacker Assembly", p. 94*

### Removing Static Brushes



- [1] Remove the screws (M3x6 with spring washer).  
 ⇒ The brushes have been removed.



Figure 29: Static Brush - Detail

## 11.4 Removing Circuit Board SRI

The circuit board SRI is at the back of the delivery stacker assembly.

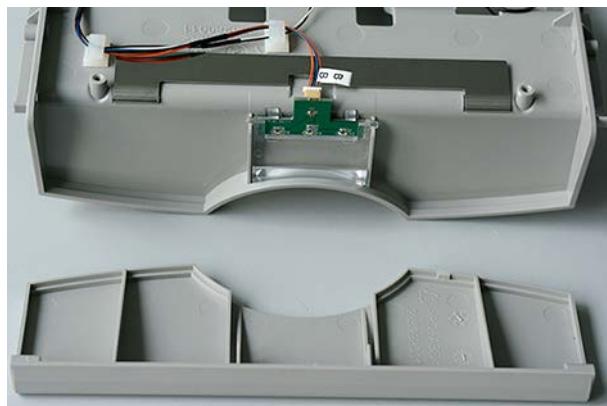
### Requirements

- Cover (left and right) of lower module has been removed.  
 → *Section 7.3 “Removing the Lower Cover”, p. 27*
- Delivery stacker assembly has been removed.  
 → *Section 11.2 “Removing Delivery Stacker Assembly”, p. 94*

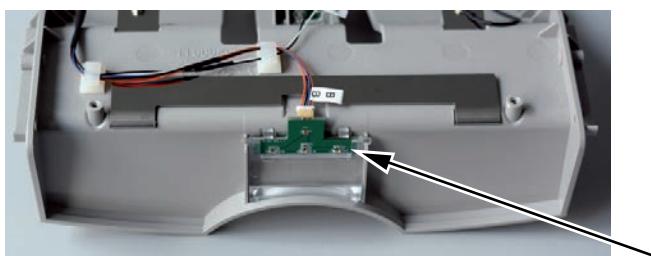
## Removing Circuit Board SRI



- [1]** Remove screws (pan head 3x5 self-tapping) on both sides.



- [2]** Remove the cover.



- [3]** Disconnect the plug connection.  
**[4]** Unplug the circuit board SRI from stacker lens.  
 ⇒ The circuit board is removed.

## Installation

- [5]** Ensure that the cable is routed through the cable clip (see figure above).

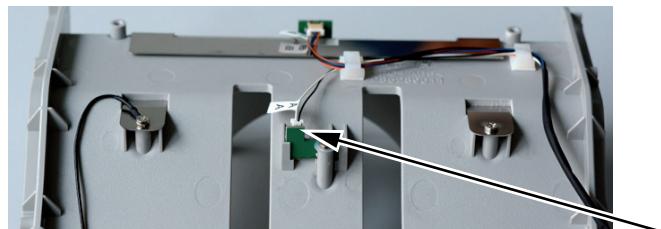
## 11.5 Removing Circuit Board STE (Photo Detector PDMST)

The circuit board STE is at the back of the delivery stacker assembly.

### Requirements

- Cover (left and right) of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Delivery stacker assembly has been removed.  
→ *Section 11.2 "Removing Delivery Stack Assembly", p. 94*

### Removing Circuit Board STE



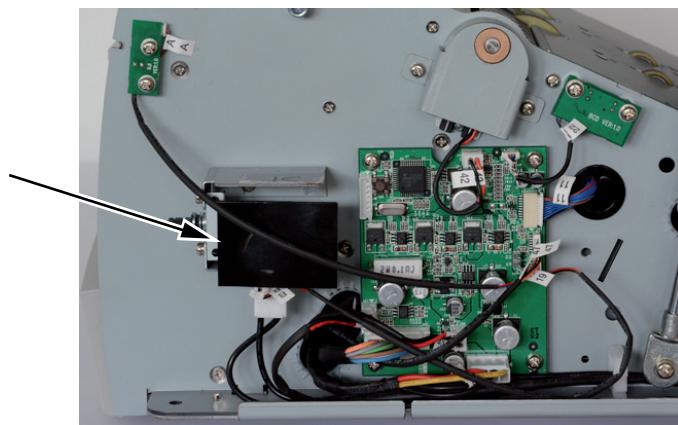
- [1] Disconnect the plug connection.
- [2] Remove the screw (pan head M3x5 self-tapping with nylon washer).  
⇒ The circuit board is removed.

### Installation

- [3] Ensure that the cable is routed through the cable clip (see figure above).

## 11.6 Removing Power Switch Board

The power switch board is on the right side of the machine.



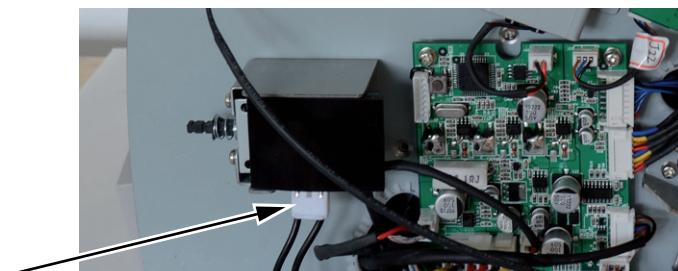
11

Figure 30: Power Switch Board - Position

## Requirements

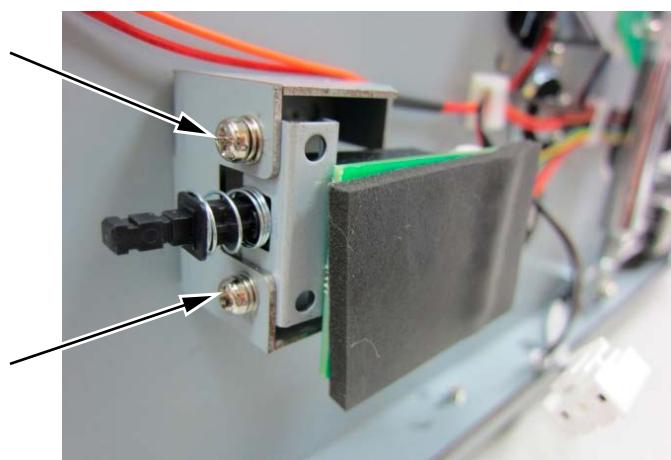
Cover (right) of lower module has been removed.  
→ Section 7.3 "Removing the Lower Cover", p. 27

## Removing Power Switch Board

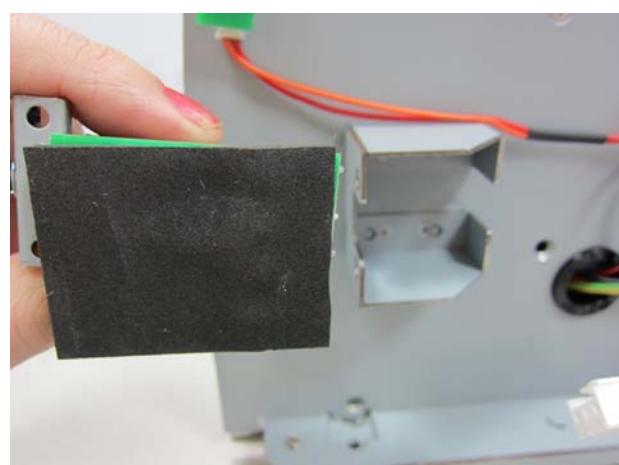


- [1] Disconnect the plug connection.

## Removing Screws



- [2] Remove both screws (M3x6 with spring washer).



- [3] Remove the switch board from the base.  
⇒ The power switch board is removed.

## Installation

- [4] Ensure that the shock foam is fixed at the switch board.

## 11.7 Removing AC Inlet with EMI Filter

The AC inlet with EMI filter is on the right side of the machine.

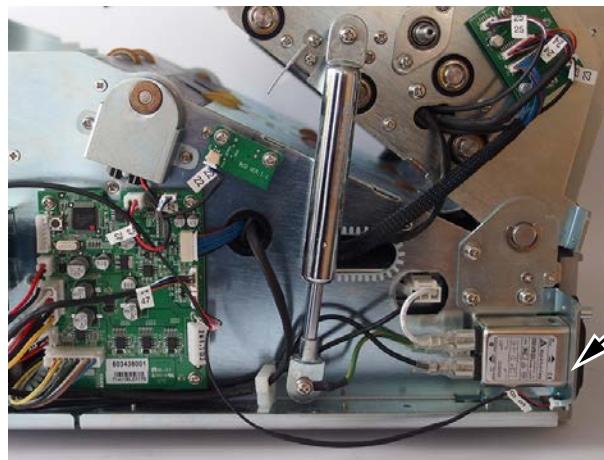


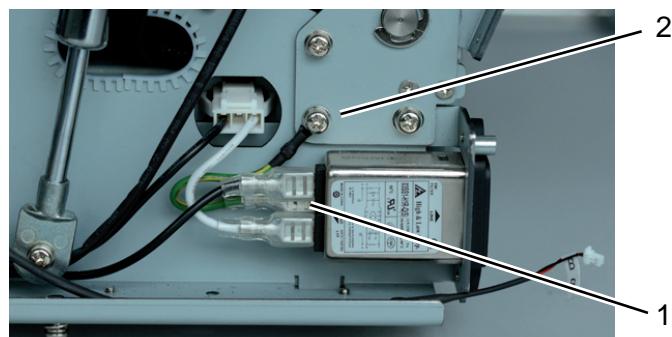
Figure 31: AC Inlet - Position

## Requirements

Cover (right) of lower module has been removed.

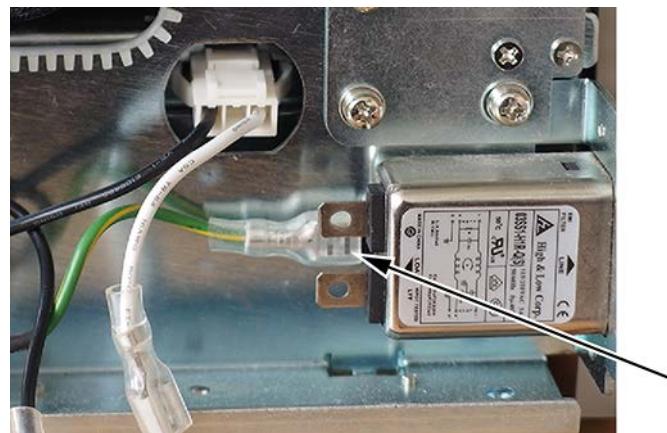
→ Section 7.3 "Removing the Lower Cover", p. 27

## Removing AC Inlet



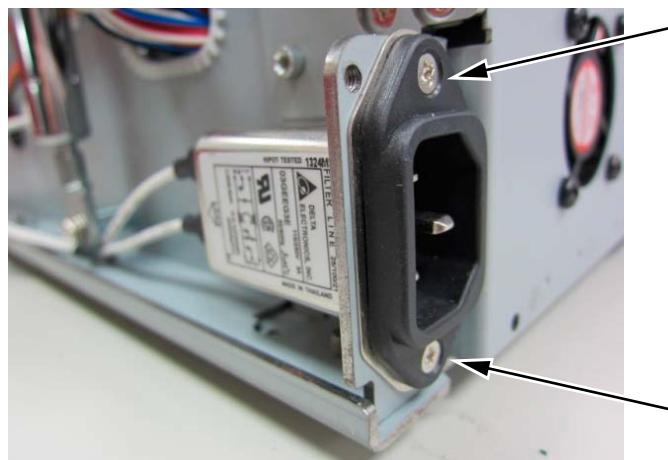
- [1] Disconnect the plug connections.

11



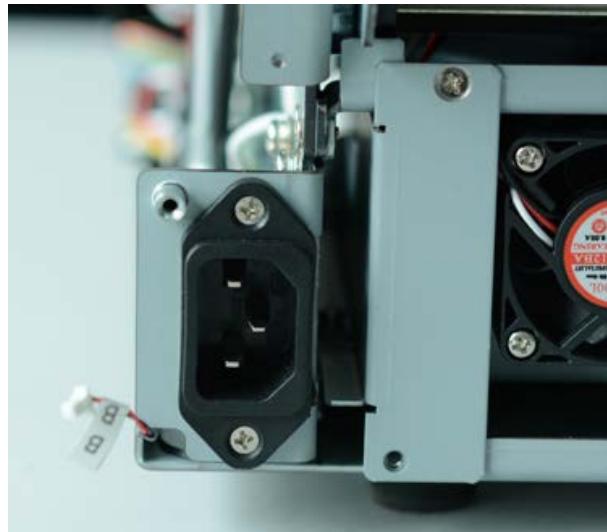
- [2] Disconnect the ground cable.

#### Removing Screws



- [3] Remove both screws (countersunk M3x5).
- [4] Pull out the socket.  
⇒ The AC inlet is removed.

## Installation



- [5] Ensure the orientation of the AC inlet (see figure above).
- [6] Ensure the connection of the cables.

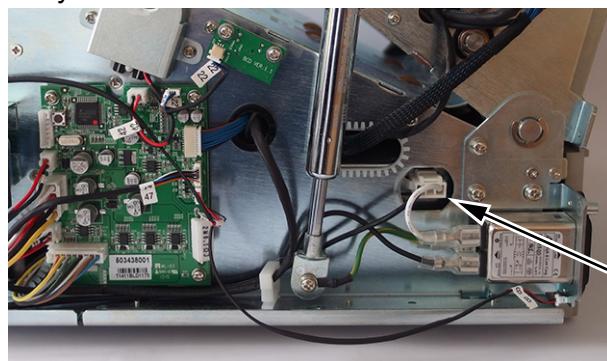
## 11.8 Removing Power Supply Assembly

The power supply assembly is on the back side of the machine.  
 The fan is combined with the power supply and cannot be replaced separately.

### Requirement

Cover (right and back) of lower module has been removed.  
 → *Section 7.3 "Removing the Lower Cover", p. 27*

### Removing Power Supply Assembly



- [1] Disconnect the plug connection on the right side of the machine by pulling slightly down with screwdriver.



- [2] Cut the nylon cable tie (1).
- [3] Disconnect the plug connection (J43) (2) to the circuit board A.

#### Removing Screws



- [4] Remove the three screws (countersunk M3x5).



- [5] Remove one screw on the bottom of the machine.

#### Pulling Out the Assembly

- [6] Pull the power supply assembly slightly outside.

⇒ The power supply assembly is removed.

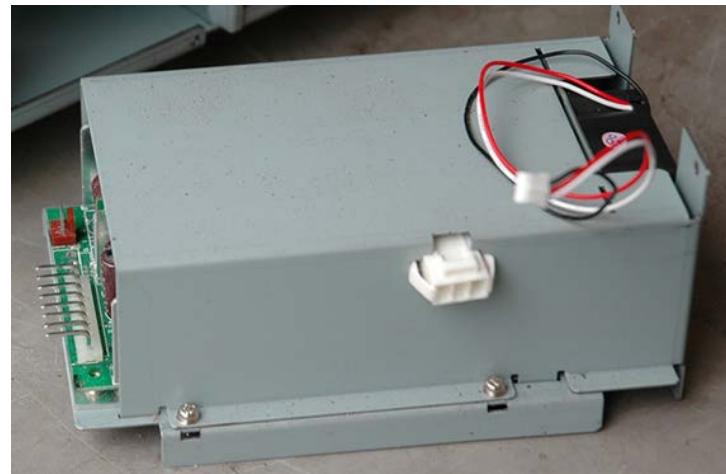


Figure 32: Power Supply Assembly

#### Installation

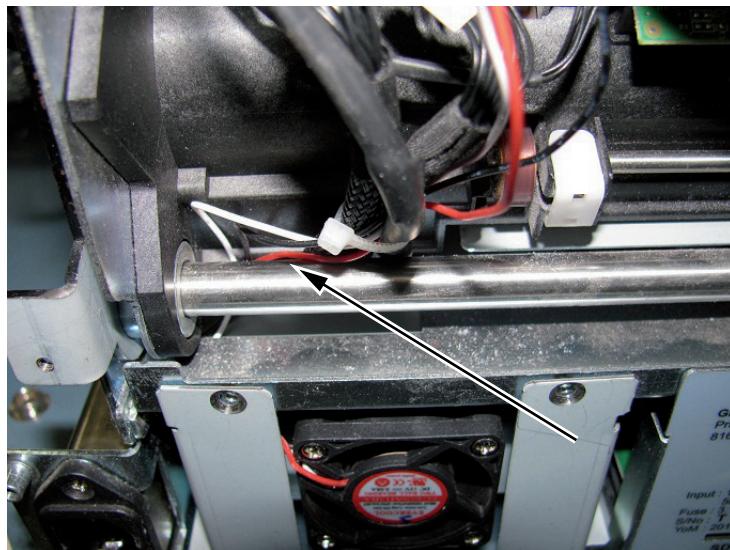
- [7] Replace the power supply assembly slightly by using the guide rail on the left side of the power supply.

**Important!**

The fan cable can be damaged by squeezing between the plate of the power supply assembly and the lower module cover.

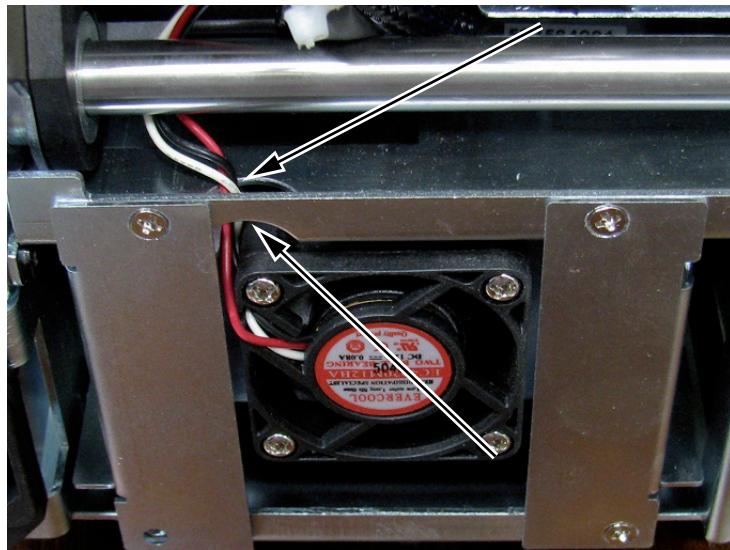
The solution depends on the serial number range of the system.

Serial No. T0100001 - T1105086



- [8] Cable routing must be done properly to avoid damage.  
Remove and insert the power supply assembly carefully.

Serial No. T1105087 and Higher



- [9] A recess has been added to the plate to relieve the fan cable.

## 11.9 Removing Connector Plate with COM Board

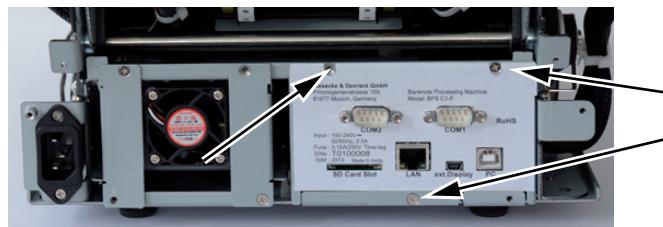
The connector plate with the COM board is on the back side of the machine.

### Requirement

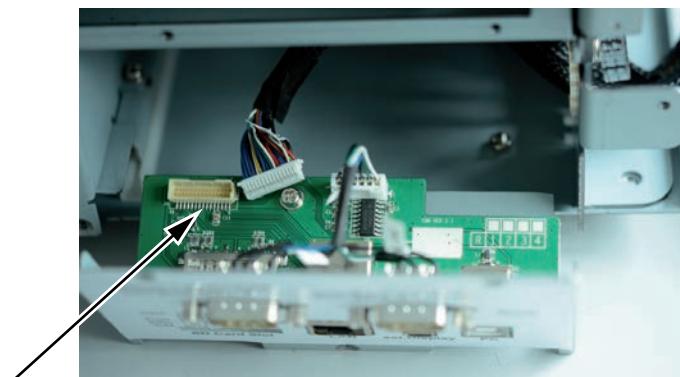
Cover (back) of lower module has been removed.

→ *Section 7.3 "Removing the Lower Cover", p. 27*

### Removing Connector Plate with COM Board



- [1] Remove the three screws (countersunk M3x5).
- [2] Pull the connector plate slightly outside.

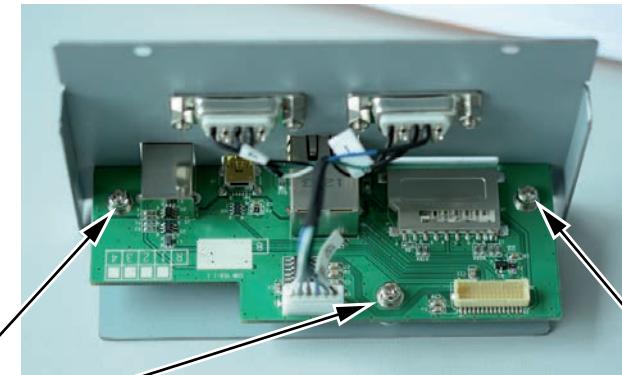


- [3] Disconnect the plug connection.  
⇒ The connector plate with COM board is removed.



- [4] Disconnect the plug connection (J46).

## Removing Screws



- [5] Remove the three screws (round head M3x6 with spring washer) on the COM board.  
⇒ The COM board is removed.

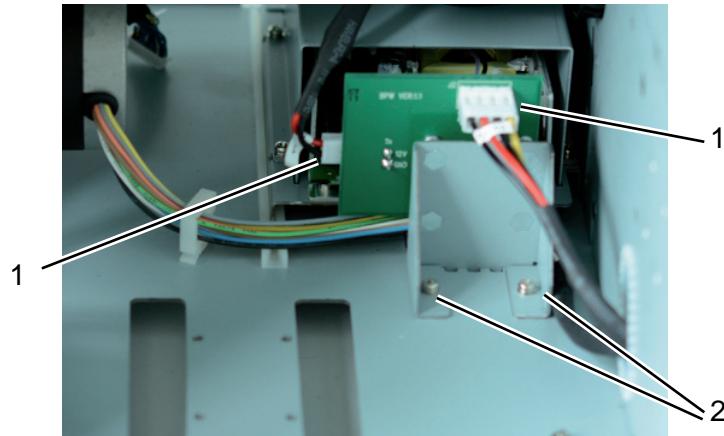
## 11.10 Removing Circuit Board BPW

The circuit board BPW is located behind the connector plate in the inner of the machine.

### Requirements

- Cover (back) of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Delivery stacker assembly has been removed.  
→ *Section 11.2 "Removing Delivery Stacker Assembly", p. 94*
- Stacker wheel has been removed.  
→ *Section 11.16 "Removing Stacker Wheel", p. 113*
- Stacker wheel motor assembly has been removed.  
→ *Section 11.17 "Removing Stacker Wheel Motor Assembly", p. 114*

### Removing Circuit Board BPW



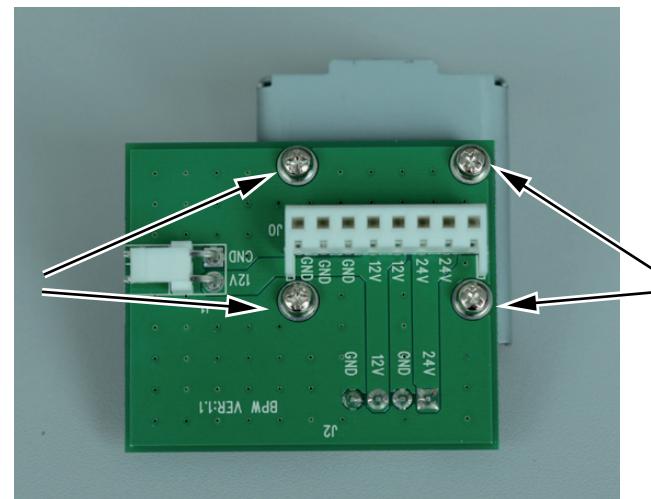
[1] Disconnect the plug connections (1).

### Removing Screws

[2] Remove the two screws (2) (M3x6 with spring washer) on the bracket.

### Removing Bracket

[3] Remove bracket with circuit board.



11

[4] Remove the four screws (round head M3x6 with spring washer).

[5] Separate circuit board BPW from bracket.

## 11.11 Removing Circuit Boards BME

The circuit board BME is on the left side of the machine.

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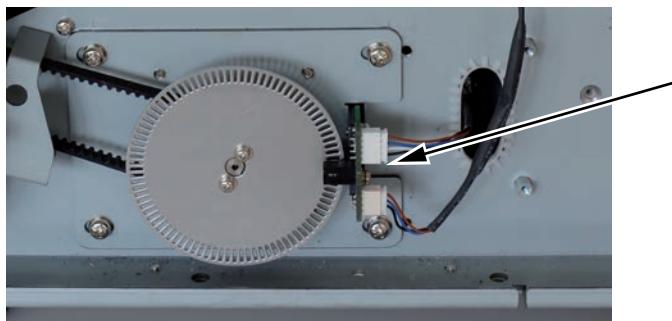
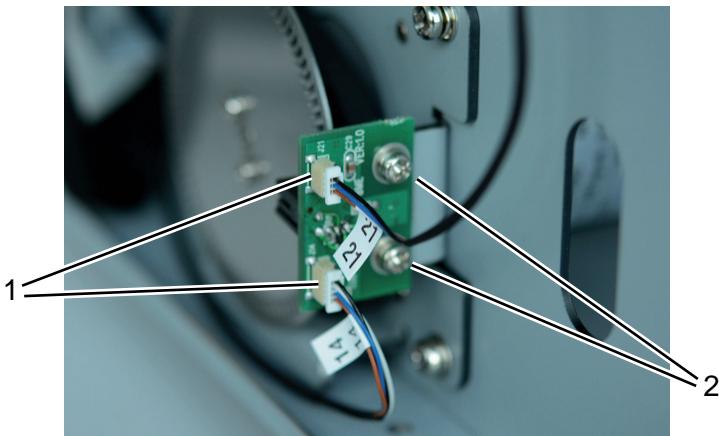


Figure 33: Circuit Board BME - Position

## Requirements

Cover (left) of lower module has been removed.  
 → *Section 7.3 "Removing the Lower Cover", p. 27*

## Removing circuit board BME



[1] Disconnect both plug connections (1).

## Removing Screws

[2] Remove the two screws (round head M3x6 with spring washer) (2) on the circuit board.  
 ⇒ The circuit board BME is removed.

11

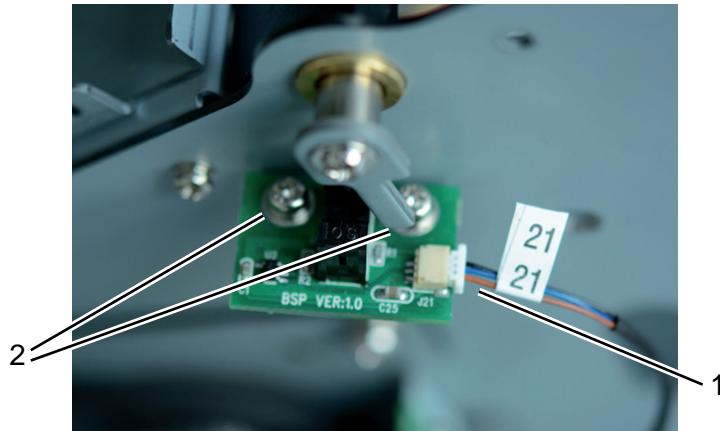
## 11.12 Removing Circuit Board BSP (Photo Detector PDMG)

The circuit board BSP is on the left side of the machine.

## Requirements

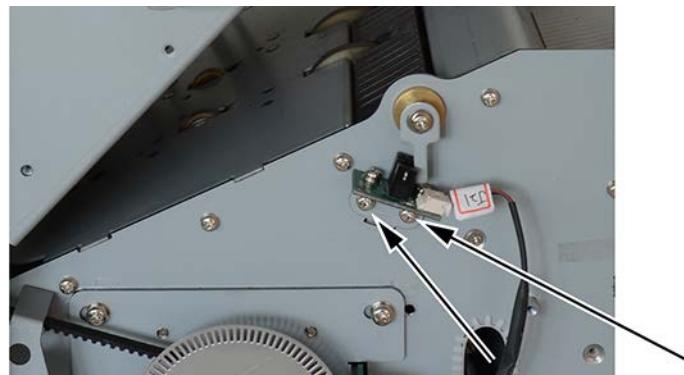
Cover (left) of lower module has been removed.  
 → *Section 7.3 "Removing the Lower Cover", p. 27*

### Removing Circuit Board BSP



- [1] Disconnect the plug connection (1).

### Removing Screws



- [2] Remove both screws (round head M3x6 with spring washer).  
 ⇒ The mount is removed.

### Removing Screws

- [3] Remove both screws (round head M3x6 with spring washer) (2).  
 ⇒ The mount is removed.
- [4] Remove the two screws on the circuit board (round head M3x6 with spring washer) (2).  
 ⇒ The circuit board BSP is removed.

11

## 11.13 Removing Circuit Board BCD (Photo Detector PDMDn)

The circuit board BCD is on the right side of the machine.

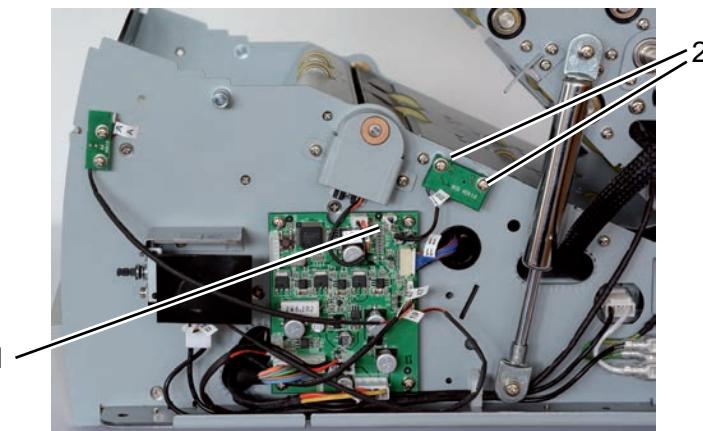
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**Requirements**

Cover (right) of lower module has been removed.

→ *Section 7.3 "Removing the Lower Cover", p. 27*

**Removing Circuit Board BCD**

[1] Disconnect the plug connection (1).

**Removing Screws**

[2] Remove both screws (2) (round head M3x6 with spring washer).

⇒ The circuit board BCD is removed.

## 11.14 Removing Circuit Board RJI (Photo Detector PDMRF)

The circuit board RJI for the reject full signal is on the right side of the machine.

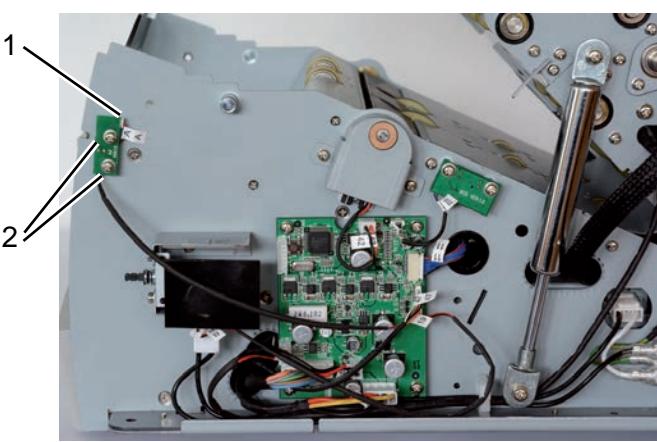


Figure 34: Circuit Board RJI - Position

**Requirements**

Cover (right) of lower module has been removed.

→ *Section 7.3 "Removing the Lower Cover", p. 27*

### Removing Circuit Board RJI

- [1] Disconnect the plug connection (1).
  - [2] Remove both screws (2) (round head M3x6 with spring washer).
- ⇒ The circuit board RJI is removed.

## 11.15 Removing Circuit Board BLD

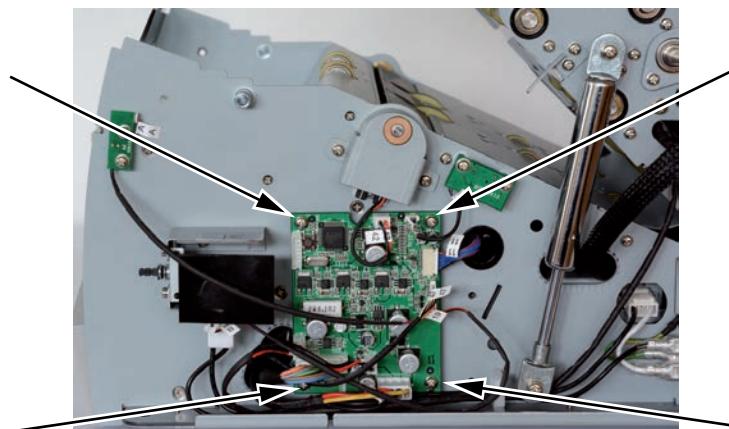
The circuit board BLD is on the right side of the machine.

### Requirements

Cover (right) of lower module has been removed.

→ *Section 7.3 “Removing the Lower Cover”, p. 27*

### Removing Circuit Board BLD



- [1] Disconnect all plug connections.
  - [2] Remove the four screws (round head M3x6 with spring washer).
- ⇒ The circuit board BLD is removed.

11

## 11.16 Removing Stacker Wheel

The stacker wheel is located behind the connector plate in the inner of the machine.

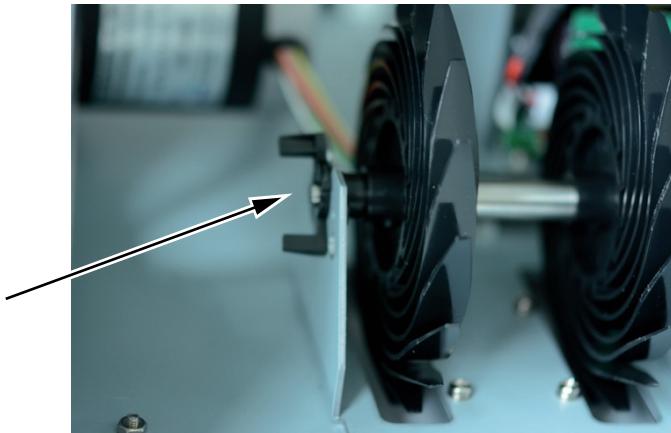
### Requirements

- Cover (back) of lower module has been removed.  
→ *Section 7.3 “Removing the Lower Cover”, p. 27*
- Delivery stacker assembly has been removed.  
→ *Section 11.2 “Removing Delivery Stacker Assembly”, p. 94*

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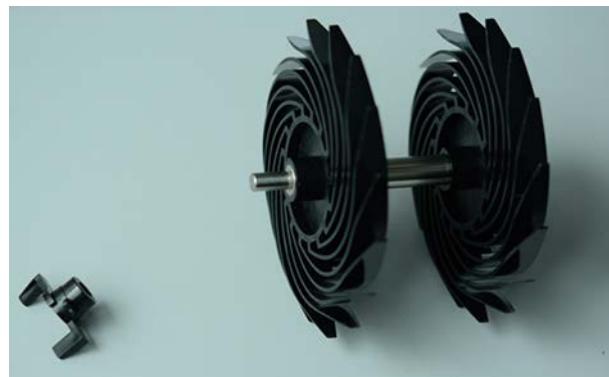
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## Removing Stacker Wheel



- [1] Remove the thumb screw on the left.

## Removing Axle



- [2] Remove the axle with the impeller.
  - [3] Remove stacker wheel from axle.
- Installation
- [4] Ensure the direction of the stacker wheel fingers (see figure above).

11

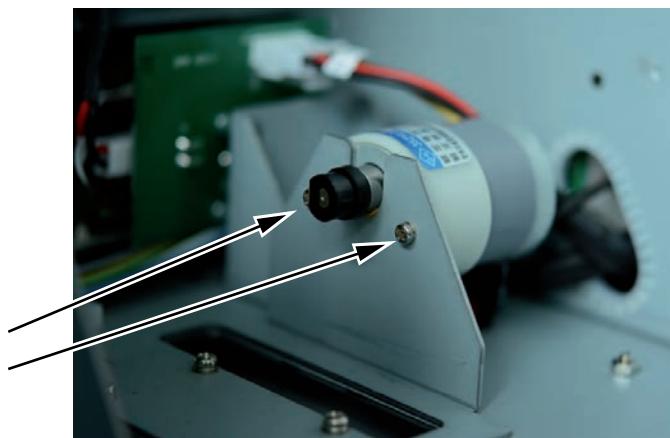
### 11.17 Removing Stacker Wheel Motor Assembly

The stacker wheel motor assembly is located behind the connector plate in the inner of the machine.

## Requirements

- Cover (back) of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Delivery stacker assembly has been removed.  
→ *Section 11.2 "Removing Delivery Stacker Assembly", p. 94*
- Stacker wheel has been removed.  
→ *Section 11.16 "Removing Stacker Wheel", p. 113*

## Removing Screws



- [1] Remove the two screws (round head 2,6x4 with spring washer).
- [2] Disconnect plug connection.
- [3] Remove the stacker wheel motor assembly.

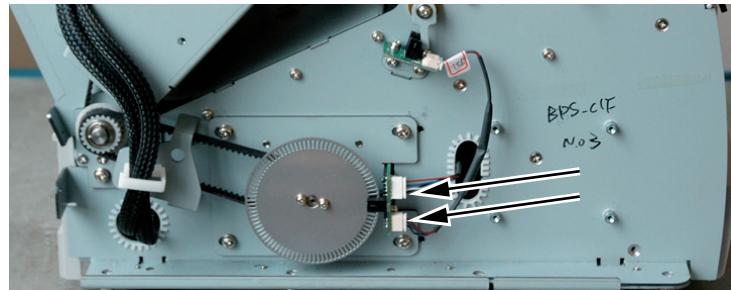
## 11.18 Removing DC Motor

The DC motor is on the left side of the machine.

## Requirements

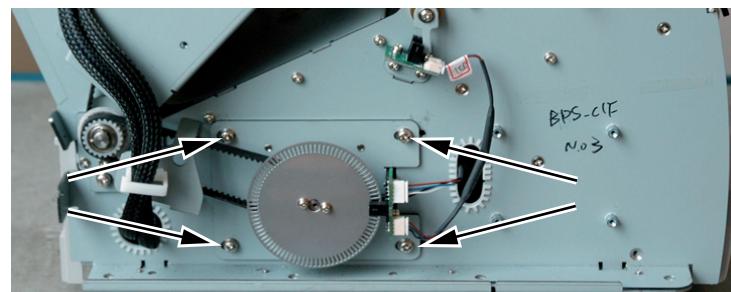
- Cover of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Delivery stacker assembly has been removed.  
→ *Section 11.2 "Removing Delivery Stacker Assembly", p. 94*
- Stacker wheel has been removed.  
→ *Section 11.16 "Removing Stacker Wheel", p. 113*

## Removing DC Motor

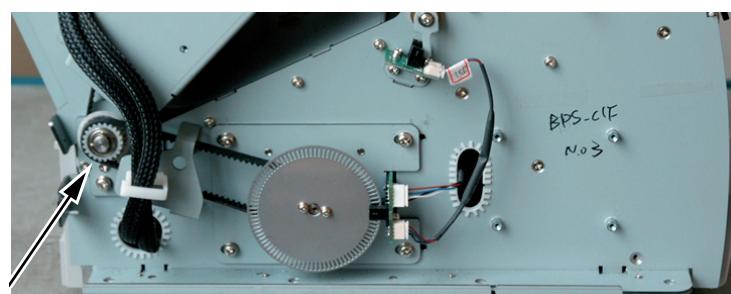


- [1]** Disconnect the plug connection to the circuit board BME on the left side of the machine.

## Loosening Screws

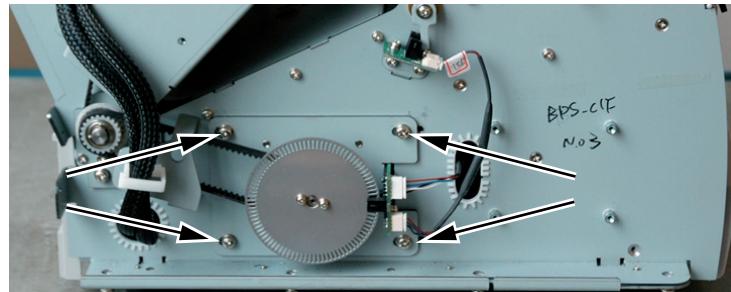


- [2]** Loosen the four screws (round head M4x6 with spring washer) on the motor base plate.



- [3]** Take toothed belt G (300/6 mm) off the left toothed wheel.

## Removing Screws



- [4] Remove the four screws on the motor base plate.



- [5] Disconnect the plug connection (48) to the circuit board BLD on the right side of the machine.



### CAUTION

Risk of burns

There is a risk of burns to fingers and hands from the hot motor.  
Do not touch the motor until it has cooled down sufficiently.

- [6] Pull out the DC motor with the encoder to the left.

## Removing Screws

- [7] Remove the two screws (round head M2,6x4 with spring washer) of the encoder.

⇒ The DC motor is separated.

- [8] Take off toothed belt G (300/6 mm).

## Installation

- [9] Ensure that the motor encoder does not touch the photo detector.

- [10] Ensure the correct position of the toothed belt.

## 11.19 Removing Main Motor Encoder

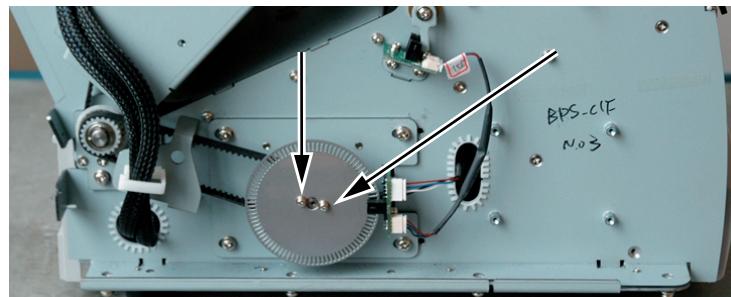
The main motor encoder is on the left side of the machine.

### Requirements

Cover (left) of lower module has been removed.

→ *Section 7.3 "Removing the Lower Cover", p. 27*

### Removing Main Motor Encoder



- [1] Remove the two screws (round head M2,6x4 with spring washer).  
 ⇒ The main motor encoder is removed.

## 11.20 Removing Solenoid and Gate Vane

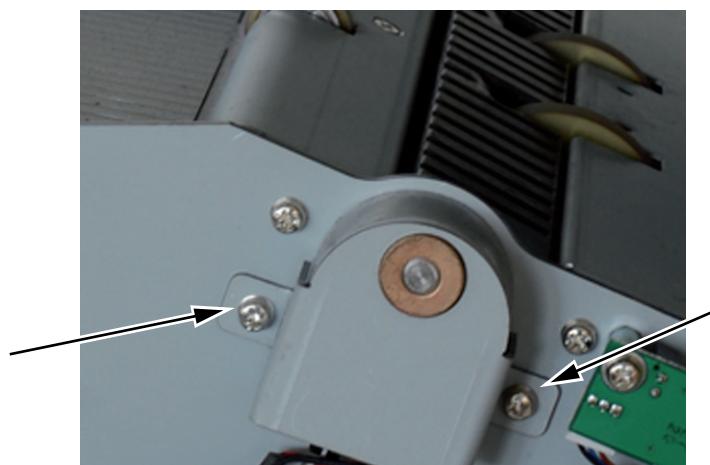
The solenoid is on the right side of the lower module, the gate vane is on the upper side.

### Requirements

Cover (right) of lower module has been removed.

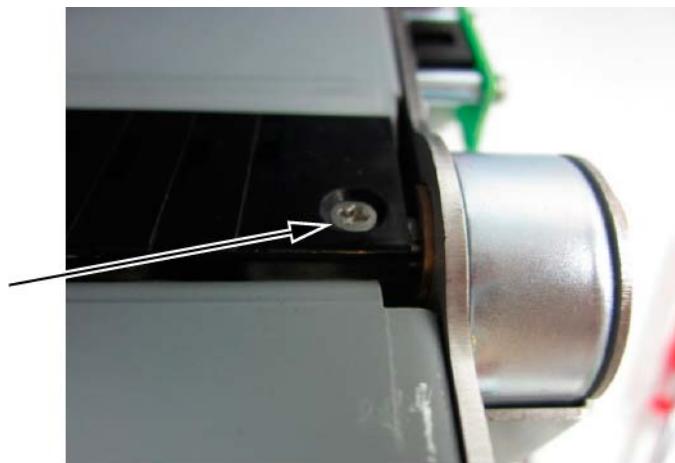
→ *Section 7.3 "Removing the Lower Cover", p. 27*

### Removing Solenoid



- [1] Remove the two screws (round head M3x6 with spring washer) on the right side of the machine.

- [2] Remove the bracket.



- [3] Remove the screw (countersunk 3x5).
- [4] Remove the solenoid.
- [5] Pull the gate vane upwards.
- [6] Pull the gate vane out to the right.
- ⇒ The gate vane is removed.

#### Removing Gate Vane



Figure 35: Gate Vane

### 11.21 Removing Passive Roller on Conveyor Plate

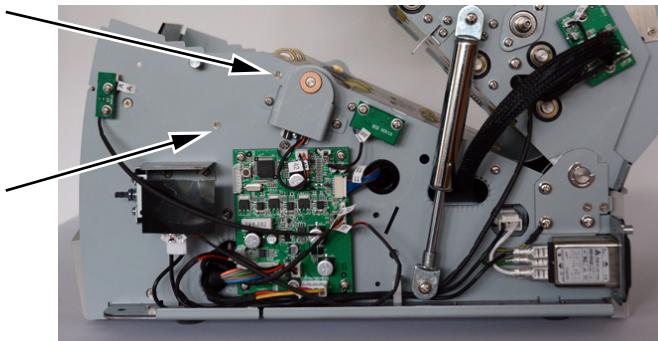
Passive rollers type A are on the back side of the lower conveyor plate.

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## Requirement

- Cover (left and right) of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Reject stacker assembly has been removed.  
→ *Section 11.1 "Removing Reject Stacker Assembly", p. 93*

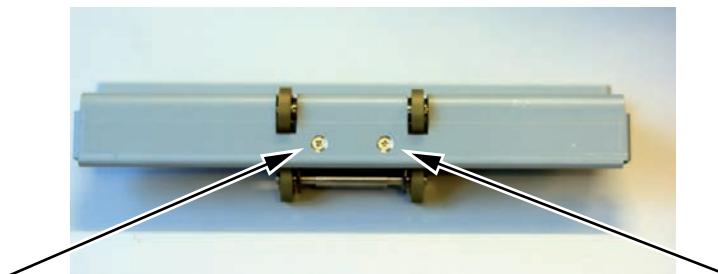
## Removing Passive Roller Type A



[1] Remove two screws (pan head M3x6) on each side.

## Removing Conveyor Plate

[2] Remove the conveyor plate.



[3] Remove two screws (countersunk M3x5) on top of conveyor plate.

## Removing Bracket

[4] Remove the bracket with passive rollers.

[5] Remove the circlip 4 mm on passive roller.

[6] Remove the passive roller type A.

## 11.22 Removing Passive Roller on Top Plate

Passive rollers type A and type B are on the back side of the top plate.

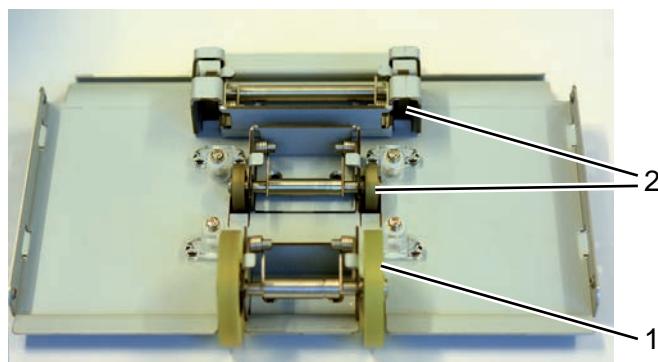


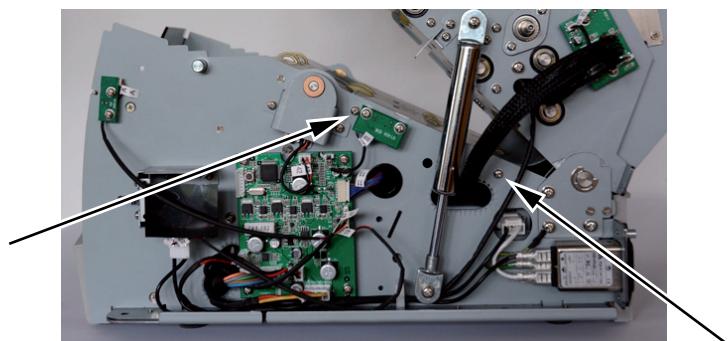
Figure 36: Passive Roller - Positions

- 1 Passive roller type A
- 2 Passive roller type B

#### Requirement

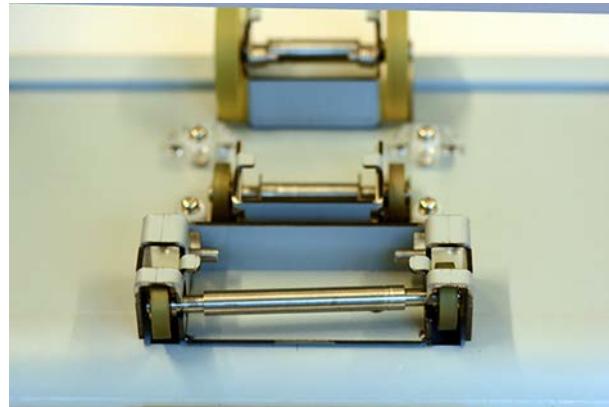
- Cover (left and right) of lower module has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Reject stacker assembly has been removed.  
→ *Section 11.1 "Removing Reject Stacker Assembly", p. 93*
- Solenoid and gate vane has been removed.  
→ *Section 11.20 "Removing Solenoid and Gate Vane", p. 118*

#### Removing Top Plate



- 11**
- [1] Remove two screws (round head M3x6 with spring washer) on each side.
  - [2] Remove the top plate assembly.
  - [3] Remove the spring.

#### Removing Passive Roller



- [4] Remove the axle with the passive roller.
- [5] Remove the circlip on passive roller.
- [6] Remove the passive roller type A.

## 12 Replacing Toothed Belts

In this chapter, you find the replacement of the toothed belts. The toothed belts are on the left and right side of the machine. For details and naming, refer to figure in → *Chapter C “Belt Diagrams”, p. 299.*

There is a different set of toothed belts depending on the serial number of the device.

Serial Number  
T0100016 - T0100815,  
T1100816 - T1102060,  
T1102080 - T1102726

List of toothed belts for devices serial number T0100016 - T0100815, T1100816 - T1102060, T1102080 - T1102726:

- Toothed belt A; 153/6 mm
- Toothed belt B; 189/6 mm
- Toothed belt C; 228/5 mm
- Toothed belt D; 171/5 mm
- Toothed belt E; 207/5 mm
- Toothed belt F; 192/6 mm
- Toothed belt G; 300/6 mm
- Toothed belt H; 177/5 mm

Serial Number  
T1102061 - T1102079,  
T1102727 and higher,  
M0300001 and higher

List of toothed belts for devices serial number T1102061 - T1102079, T1102727 and higher, M0300001 and higher:

- Toothed belt A; 153/6 mm
- Toothed belt B; 189/6 mm
- Toothed belt C; 222/5 mm
- Toothed belt D; 168/5 mm
- Toothed belt E; 213/5 mm
- Toothed belt F; 192/6 mm
- Toothed belt G; 300/6 mm
- Toothed belt H; 177/5 mm

### 12.1 Removing Toothed Belt A

12

Toothed belt A (153/6 mm) is on the axle of the friction element set. Remove the kicker roller module and the feeder roller assembly to remove toothed belt A.

- *Section 10.6 “Removing Kicker Roller Module”, p. 70*
- *Section 10.7 “Removing Feeder Roller Assembly”, p. 73*

## 12.2 Removing Toothed Belt B, C, D, E, F

### Requirements

- Lower cover has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Middle cover has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*
- Belt guard has been removed.  
→ *Section 10.1 "Preparatory Work - Removing the Belt Guard", p. 63*

For the removal of the toothed belts, observe the correct order of the belts (see figures below).

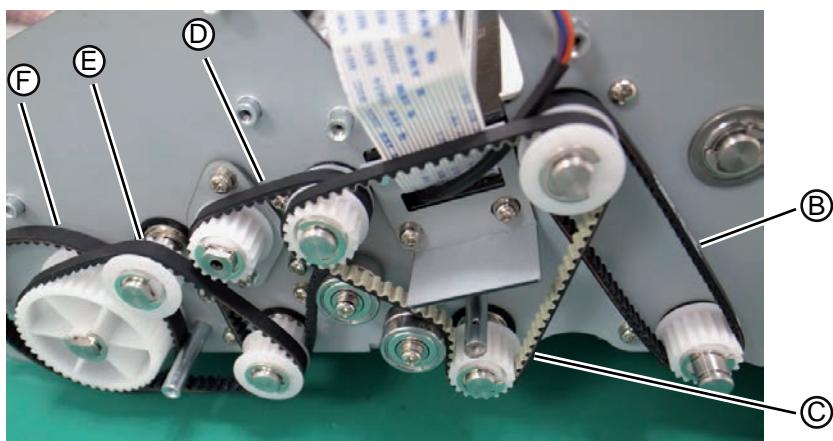


Figure 37: Toothed Belts - Order (device serial number T0100016 - T0100815, T1100816 - T1102060, T1102080 - T1102726)

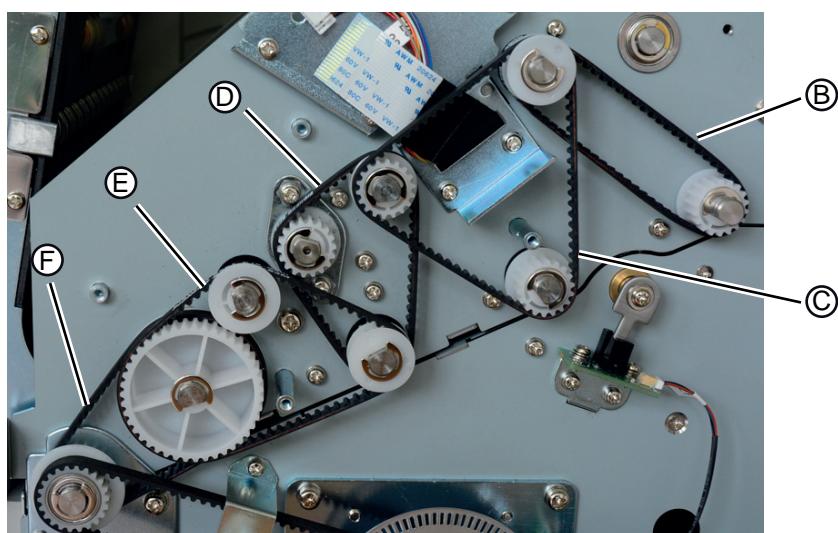
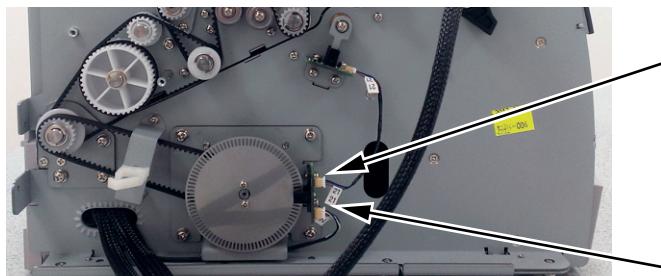


Figure 38: Toothed Belts - Order (device serial number T1102061 to T1102079, T1102727 and higher, M0300001 and higher)

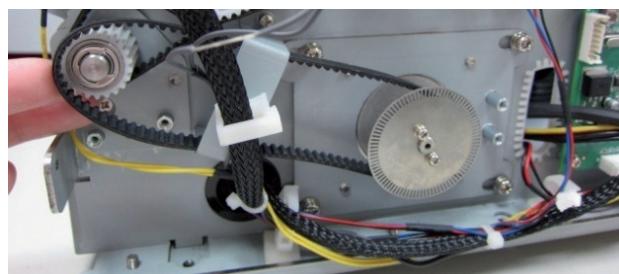
## 12.3 Removing Toothed Belt G (300/6 mm)

### Requirements

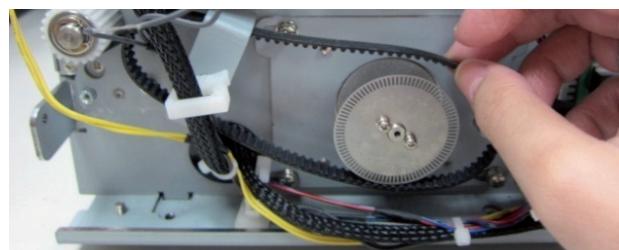
- Left lower cover has been removed.  
→ *Section 7.3 "Removing the Lower Cover", p. 27*
- Left middle cover has been removed.  
→ *Section 7.2 "Removing the Middle Cover", p. 25*



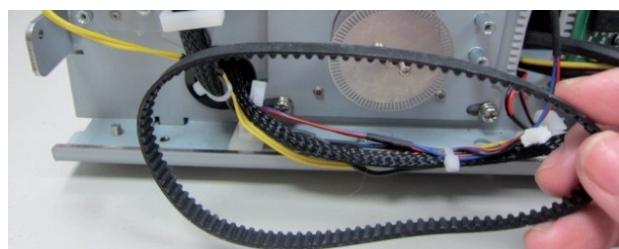
- [1]** Remove the two screws (M3x6 with spring washer) on the circuit board BME.



- [2]** Take toothed belt G off the left toothed wheel.



- [3]** Thread toothed belt G through the metal bracket.



- [4]** Take toothed belt G off the pulse generator.

⇒ Toothed belt G has been removed.

## 12.4 Removing Toothed Belt H (177/5 mm)

Requirements

Right middle cover has been removed.

→ Section 7.2 "Removing the Middle Cover", p. 25

For the removal of the toothed belt, see figure below.

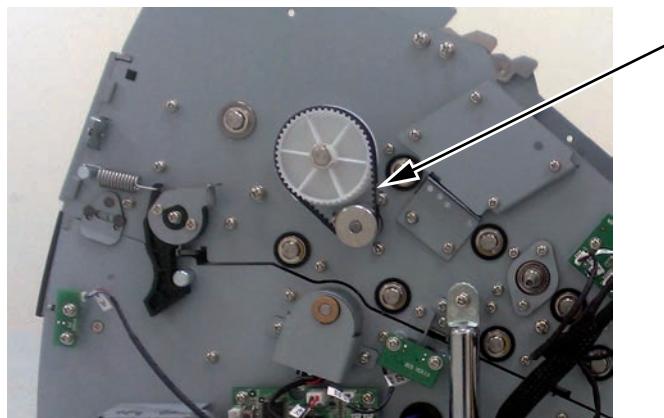


Figure 39: Toothed Belt H - Position

## 13 Retrofitting

In this chapter, you find retrofitting procedures for the BPS C1.

- → *Section 13.1 “Mounting Dust Gaskets to Prevent Soiled Photo Detectors”, p. 127*
- → *Section 13.2 “Mounting Strip for Reject Stacker Note Holder”, p. 129*
- → *Section 13.3 “Using LED Self-Retaining Clip to Prevent Wrong Solenoid Error”, p. 132*

### 13.1 Mounting Dust Gaskets to Prevent Soiled Photo Detectors

During the banknote processing, dust may accumulate between circuit board and corresponding trigger holder of the transport photo detectors.

To prevent soiled photo detectors, a retrofit kit with eight dust gaskets is available.

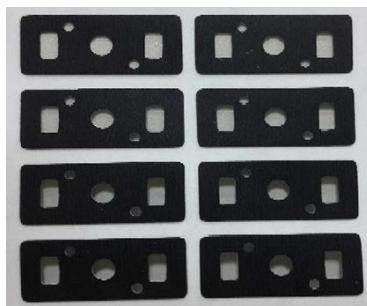


Figure 40: Dust Gasket Set (Art.-No. 510940xx1)



#### Important!

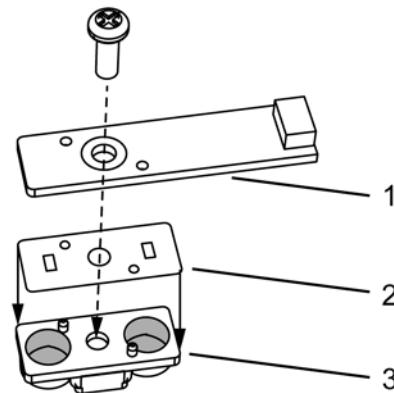
The gaskets are already integrated (November 2015) in the BPS C1 from serial number T1111905 upwards.

Affected Photo Detectors

The following transport photo detectors are affected.

- Photo detector TT0 (PD1L), one gasket required
- Photo detector TT1 (PD1R), one gasket required
- Photo detector TUV (PD2), one gasket required
- Photo detector MUV, one gasket required
- Photo detector MT0 (PD3L/R), two gaskets required
- Photo detector MT1 (PD4L/R), two gaskets required

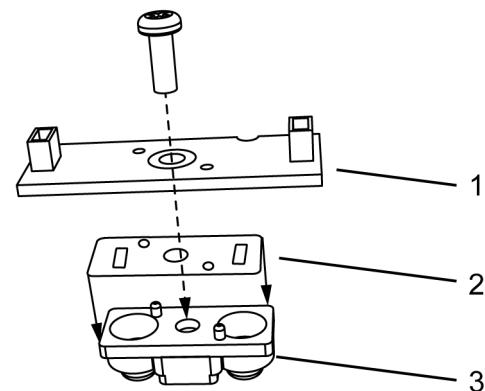
**Photo Detectors TT0  
(PD1L) and TT1  
(PD1R)**



**Figure 41: Example for Photo Detector TT0 (PD1L)**

- 1 Circuit board TT0
- 2 Gasket
- 3 Trigger holder with light protection sleeve inside

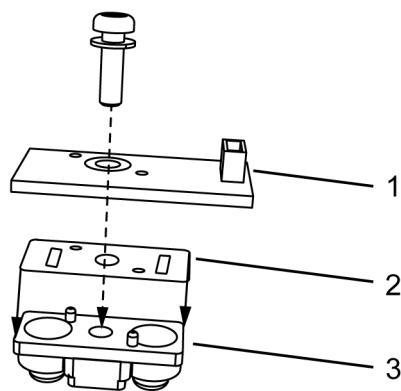
**Photo Detector TUV  
(PD2)**



**Figure 42: Photo Detector TUV (PD2)**

- 1 Circuit board TUV
- 2 Gasket
- 3 Trigger holder

**Photo Detector MUV**



**Figure 43: Photo Detector MUV**

- 1 Circuit board MUV

- 2 Gasket  
 3 Trigger holder

Photo Detectors MT0  
 (PD3L/R) and MT1  
 (PD4L/R)

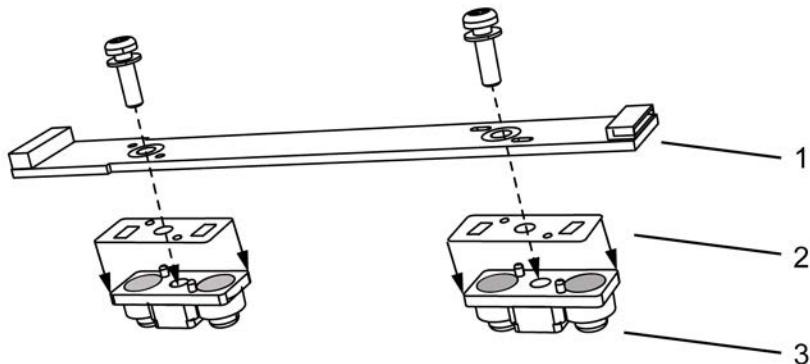


Figure 44: Example for Photo Detector MT0 (PD3L/R)

- 1 Circuit board MT0  
 2 Gasket  
 3 Trigger holder with light protection sleeve inside

#### Procedure

- [1] Remove the photo detector as described in the replacement procedure.
- [2] Dismantle the photo detector.
- [3] Clean the trigger holder (3).
- [4] Place the dust gasket (2) with the adhesive side on the trigger holder (3).



#### Important!

Be sure that the light protection sleeve for photo detectors TT0, TT1, MT0, and MT1 is inside the trigger holder.

- [5] See the figures above for assembling.
- [6] Replace the photo detector in the reverse order.

## 13.2 Mounting Strip for Reject Stacker Note Holder

During the banknote processing, the upper banknote in the reject stacker may be pushed out by the next incoming banknote.

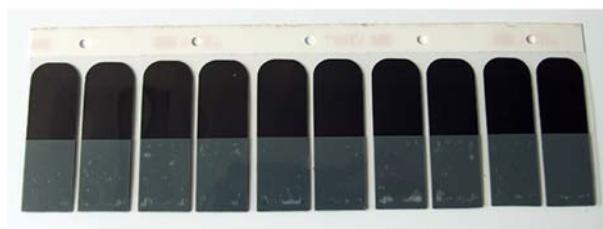
This problem may be caused by the following:

- More than 70 banknotes are stacked.
- Most of the banknotes are wrinkled or rolled.

- The banknotes are pressed on the leading edges and the trailing edges are lifted, see figure below.



To solve the problem, a set of self-adhesive note holder strips is available. The set consists of 10 stripes for five machines.



**Figure 45: Note Holder Strip Set (Art.-No. 514784xx1)**

Fix two note holder strips on the note holder of the machine as described below.

#### Procedure



- [1] Cut off two note holder strips from the set of ten.

## Bending Note Holder Strips

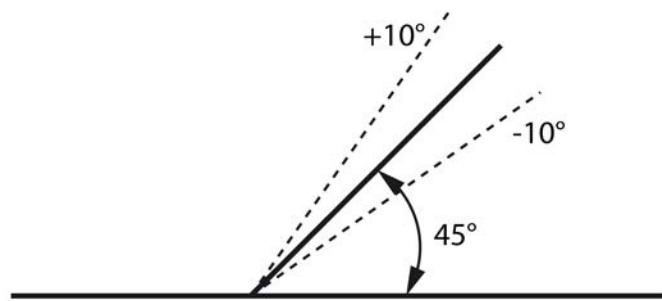


- [2] Fold the assembly of the two note holder strips using a soft edge.  
**As an example**, use the cover of the BPS C1 as shown.



### Important!

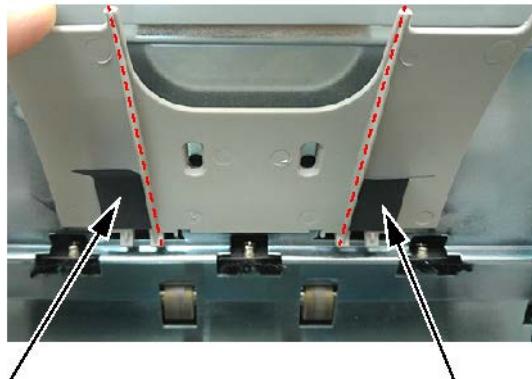
Excess folding results in loss of flexibility of the strip material.



- [3] Use the template above to adjust the correct angle of  $45^\circ \pm 10^\circ$ .  
[4] Open the lower module.

## Fixing Note Holder Strips

- [5] Remove the note holder strip from the carrier foil.



[6] Fix the strip along the given profile of the reject holder.

⇒ Retrofitting is finished.

### 13.3 Using LED Self-Retaining Clip to Prevent Wrong Solenoid Error

Wrong Solenoid Error  
Caused by Bright  
Ambient Light

During the banknote processing, the monitoring photo detector PDMRJ does not detect the first object (banknote or document) which is sent to the reject stacker.

A wrong solenoid error is shown.



Cause of Error

The problem may be caused by the extra monitoring for the reject stacker that is implemented with software release 3.0.

This feature might cause problems with reflections on the receiver of the photo detector PDMRJ.

The incoming banknote reflects the ambient light or the daylight depending on the intensity. Due to the reflection, the sensor does not recognize the banknote.

The machine control detects a wrong direction of the banknote and a wrong position of the solenoid/gate.

Solution

To prevent problems with reflections of ambient light, do the following:

- Turn away the BPS C1 from strong impact of light.
- Use an LED self-retaining clip in front of the receiver diode of the photo detector. See the pictures below.

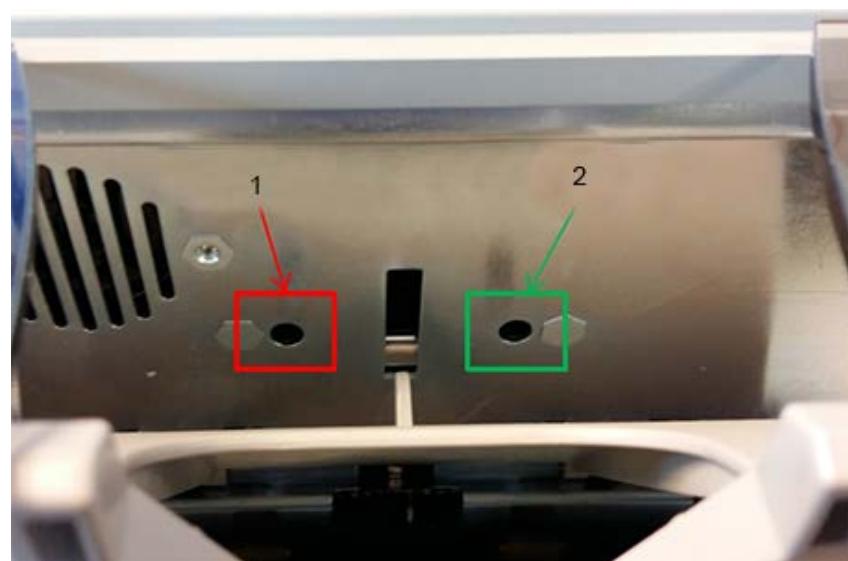


Figure 46: Photo Detector Emitter (1) and Receiver (2)

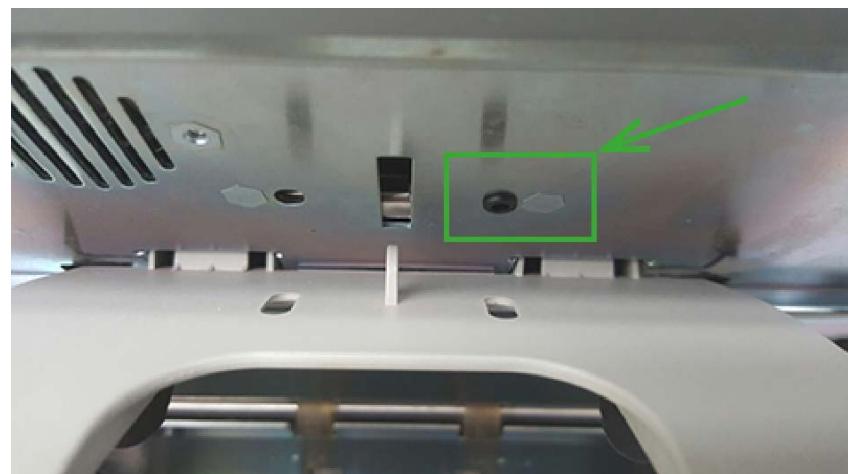


Figure 47: Photo Detector with LED Self-Retaining Clip on the Receiver

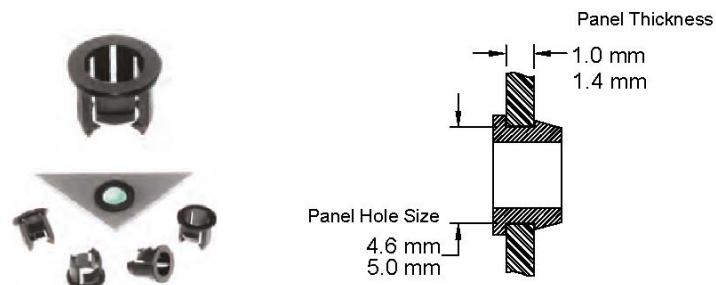


Figure 48: LED Self-Retaining Clip Characteristics

The LED self-retaining clip is a standard part (T-1 (3 mm)) and can be purchased locally.

For more information, see → *BPS C1 Service Bulletin 017*.

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## 14 Adjustment

This chapter contains the following adjustment procedures.

- → *Section 14.1 “Adjusting the Singler Gap”, p. 135*
- → *Section 14.2 “Adjusting Feeder Roller Kicker Roller Ratio”, p. 137*
- → *Section 14.3 “Adjusting Retarding Wheel Symmetry”, p. 139*
- → *Section 14.4 “Adjusting Retarding Wheel”, p. 139*
- → *Section 14.5 “Adjusting Magnetic Sensor MT or MRS”, p. 140*

### 14.1 Adjusting the Singler Gap

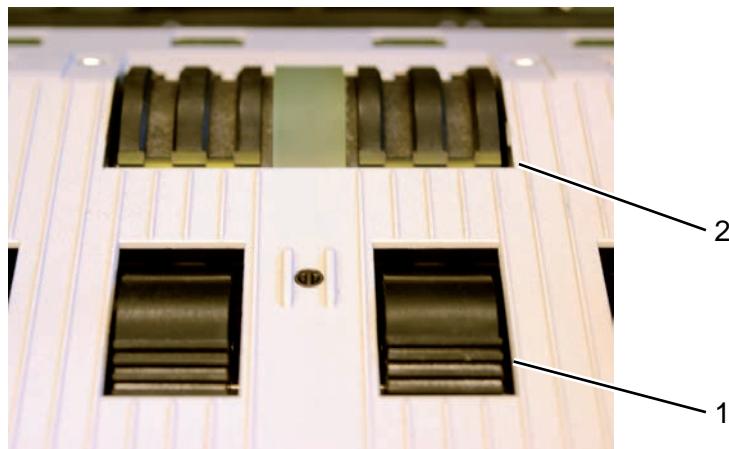
To adjust the singler, the following steps are required.

- Basic adjustment
- Fine adjustment

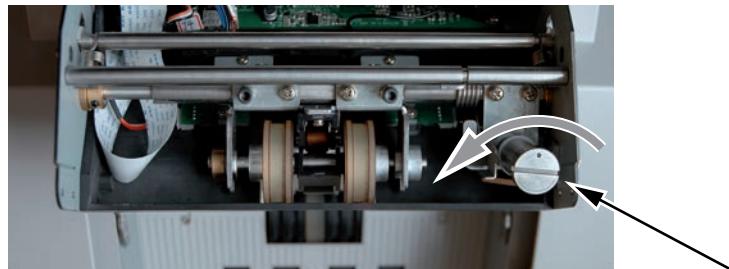
#### 14.1.1 Basic Adjustment



- [1] Turn the adjuster screw in a clockwise direction using a coin or a suitable tool.  
⇒ The singler gap is opened.



- [2] Turn the rollers forward in the direction of the guide plate until the friction elements (1) are opposite the retarding roller (2).
- [3] Place a test banknote or a new banknote into the singler on the right and left-hand side that is leveled to rollers.
- [4] Check the resistance.  
 ⇒ On both sides, no resistance is noticeable.

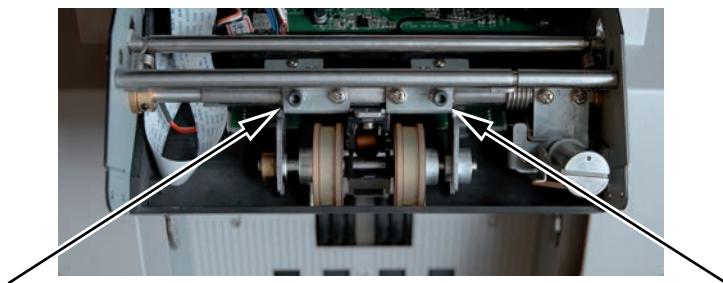


- [5] Turn the adjuster screw counter-clockwise.
- [6] Check the resistance using the test banknote or a new banknote.  
 When pulling out the banknote from the singler gap, the force that is used should be between approximately 1.0 N and 1.5 N. Use a spring scale for measurement.
- [7] Check both sides of the singler.
  - The resistance is the same on both sides.  
 The singler is correctly adjusted.
  - The resistance is different on one side.  
 Carry out fine adjustment.  
 → *Section 14.1.2 "Fine Adjustment", p. 137*

### 14.1.2 Fine Adjustment

Fine adjustment of the singler is only necessary if a different resistance has been identified on one side of the singler when performing the basic adjustment.

- [1] Start on the side with the greater resistance.



- [2] Loose the double locking nut 7 mm with wrench holding the Allen screw from top.
- [3] To reduce the resistance, adjust the screw(tight the Allen screw clockwise with little rotation).
- [4] Check the resistance using the test banknote or a new banknote.  
 When pulling out the banknote from the singler gap, the force that is used should be between approximately 1.0 N and 1.5 N. Use a spring scale for measurement.
  - Resistance is not the same  
 Repeat the steps → [1] to → [4].
  - Resistance is the same  
 The fine adjustment is completed.
- [5] Tighten the lock nut by holding the Allen screw tightly.

### 14.2 Adjusting Feeder Roller Kicker Roller Ratio

The adjustment of the feeder roller and kicker roller ratio have to be done after replacement work.

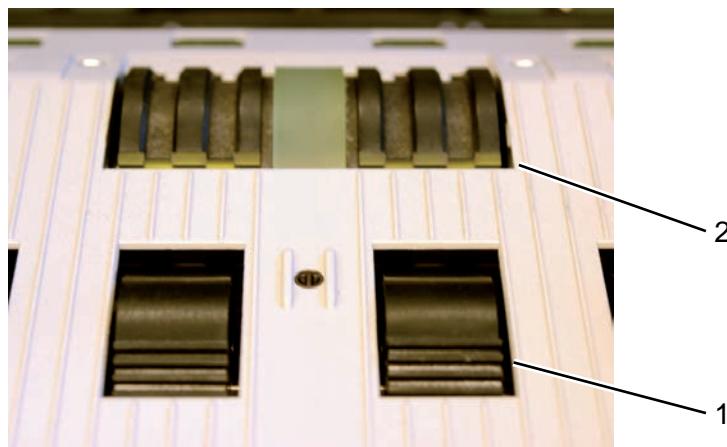
## Requirement

- Cover of the top module has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*
- Belt guard has been removed.  
→ *Section 10.1 "Preparatory Work - Removing the Belt Guard", p. 63*
- Operating unit has been removed.  
→ *Section 10.2 "Operating Unit", p. 64*
- Singler plate has been removed.  
→ *Section 10.3 "Removing Singler Plate and Circuit Board FFT", p. 66*

## Adjusting Ratio Rollers

[1] Loosen the set screw on the ring gear of the kicker roller shaft.

[2] Set the singler plate into the singler.



[3] Adjust both rollers as shown.

- Kicker roller - four black rows visible
- Feeder roller - one yellow row visible

[4] Remove the singler plate carefully.

[5] Hold the kicker roller.

[6] Fasten the set screws.

[7] Replace singler plate.

## 14.3 Adjusting Retarding Wheel Symmetry

Adjust the retarding wheel symmetry in case of "Test Run - Strict Mode" the values for TiltB-R and TiltB-L are different.

For more information see:

→ *Section 17.1 "Checking Sensor Status - Strict Mode", p. 152*

### Requirement

Cover of top module has been removed.

→ *Section 7.1 "Removing the Top Cover", p. 25*

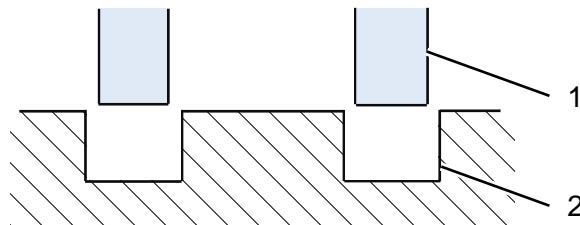
Follow the procedure for fine adjustment.

→ *Section 14.1.2 "Fine Adjustment", p. 137*

## 14.4 Adjusting Retarding Wheel

The adjustment of the retarding wheel has to be done after replacement work. The proper transport of the banknotes depends on a correct adjustment.

The nose of retarding wheel (1) should fit into the middle of the groove (2) of the feeder roller.



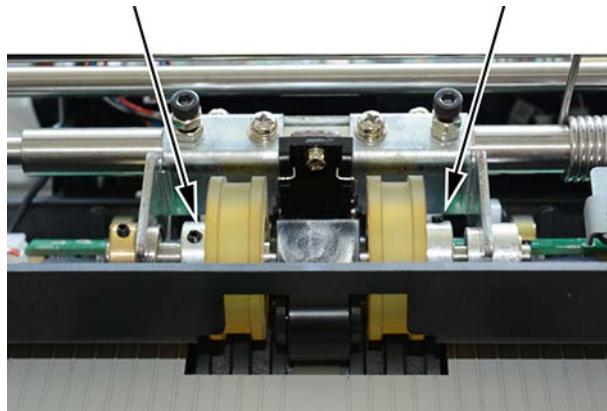
**Figure 49: Adjusted Retarding Wheel**

### Requirement

Cover of the top module has been removed.

→ *Section 7.1 "Removing the Top Cover", p. 25*

### Adjusting Retarding Wheel



- [1] Loosen the two screws (Allen screw M3x6).
- [2] Shift the retarding wheel for fitting.
- [3] Fasten the two screws.

## 14.5 Adjusting Magnetic Sensor MT or MRS

This chapter describes the adjustment of the magnetic sensor MT or MRS.

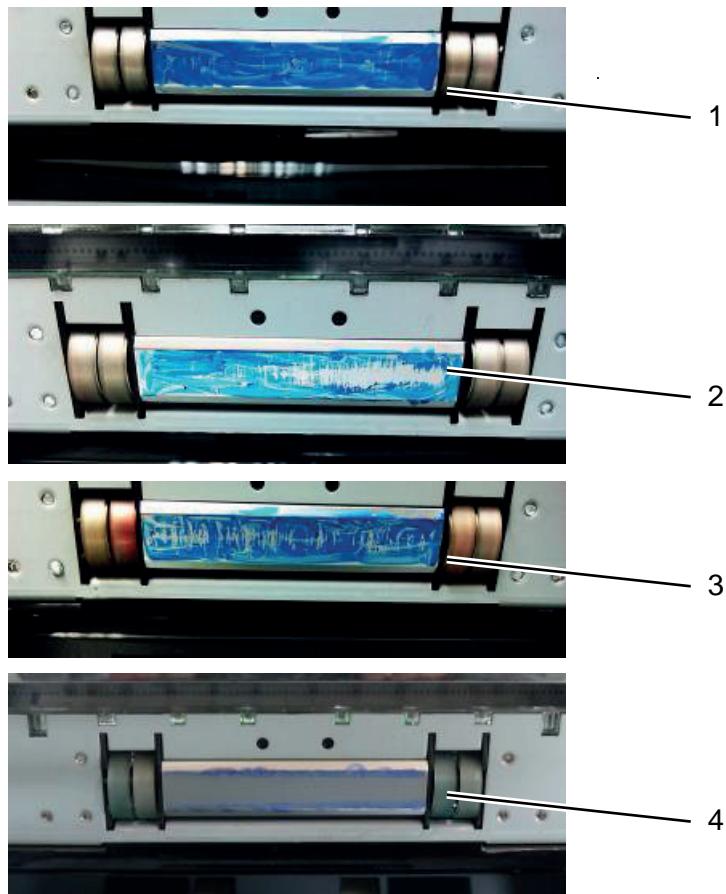
Check the position of the sensors and if necessary change the distances.

### Requirement

- White board marker
- Cover of top module has been removed.  
→ *Section 7.1 "Removing the Top Cover", p. 25*

### Checking Position

- [1] Open the top module.
- [2] Take white board marker and mark the sensors.
- [3] Close the top module.
- [4] Run the system for a few seconds.
- [5] Open the top module.



**[6] Check the marking on the sensors.**



**Important!**

The figure shows a former model; the markings are identical for all models.

⇒ The following results can be observed:

1. **No contact** - the marking is not rubbed off  
The gap between the sensor and the rollers is too large.  
**Remove sensor spacers.**
2. **Contact is not even** - marking on the left is not rubbed off  
The left gap is too large, **remove sensor spacer on the left.**
3. **Perfect result** - marking is rubbed off a little and even

**Nothing to do.**

4. **Too close** - marking is rubbed of too much

**Insert the sensor spacers.**

**Changing Distances of the Sensors**

[7]

Insert or remove the sensor spacers to change the distance of the sensors.

Follow for detailed instructions the replacement procedures in the main chapter.

→ *Section 9.3.3 “Removing Circuit Board MRS with Magnetic Sensor”, p. 50*

→ *Section 9.3.5 “Removing Magnetic Sensors MT”, p. 54*

## 15 Cleaning

15

To keep the machine in perfect condition and operating correctly, you must clean the machine at regular intervals.

Take note of the following recommendations depending on the banknote quality and application:

- Clean once a day
- Clean after 40,000 banknotes
- Clean when looking soiled

Always switch off the machine before cleaning it.



### DANGER

Risk of electric shock

Electric shock may cause death or serious injury.

1. Before starting any work, switch off the machine/device.
2. Unplug the power plug from the power socket.
3. Secure the machine/device against being switched back on.

Note also the following safety warnings.



### DANGER

Risk of electric shock

Electric shock may result in death or serious injury.

Only field engineers are permitted to remove panel sections screwed in place on the machine/device.



### WARNING

Do not perform any maintenance and service work.

There is a risk of serious injury.

Have maintenance and service work carried out by specially trained maintenance personnel and field engineers.



### CAUTION

Risk from raised dust

Inhaling dust can be hazardous to your health.

Dust in the air can also damage bearings and electronic parts.

Use a vacuum cleaner with a micro-filter.

Never use compressed air for cleaning purposes.

**NOTICE**

Incorrect cleaning materials  
can damage the machine/device.  
Do not use cleaning material with a corrosive or scouring effect.

**NOTICE**

Contaminated cleaning cloth  
may damage the measurement window.  
Always use a new cleaning cloth. Grit contamination from previous  
cleaning may damage the measurement window.  
Use each cleaning cloth once only.

**Important!**

Ensure that no fluid leaks into the inside of the machine.

**Cleaning Aids**

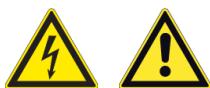
Use the following tools for cleaning:

- Commercially available cleaning solutions
- Clean, lint-free cloths (for cleaning and drying)
- Isopropyl alcohol for heavy soiling
- Commercially available vacuum device with micro filter

To clean the machine, proceed as follows:

**Procedure**

[1] Switch off the machine.

**DANGER**

Risk of electric shock

Electric shock may result in death or serious injury.

Always unplug the machine by pulling on the plug and never by  
pulling on the cable.

[2] Unplug the mains plug from the power socket.

[3] Check the machine for damage.

**Important!**

If safety-relevant damage is visible (damaged or broken network  
cables or plugs, sharp-edged parts) contact your service partner or  
local service organization.

[4] Thoroughly wring out the moistened cleaning cloth.

## Cleaning Machine

- [5] Clean the housing with circular movements.
- [6] Remove the cleaning fluid with a clean, damp cloth.
- [7] Dry the housing with a clean, dry cloth.

## Cleaning the Transport Section

- [8] Open both transport sections.
- [9] Remove the dust using a cleaning cloth.
- [10] If the soiling is heavy, vacuum the banknote transport paths, singler area, and measurement windows. Do not blow conductive particles into the machine.
- [11] Clean the singler area with a clean, damp cloth.
- [12] Dry the singler area with a clean, dry cloth.



**Important!**

Use isopropyl alcohol to remove heavy soiling.

- [13] Thoroughly wring out the moistened cleaning cloth.
- [14] Clean the transport sections, rollers, and measurement window.
- [15] Dry the transport section, rollers, and measurement window using a dry, lint-free cloth.



**Important!**

Ensure that all parts are dry and without residues.

- [16] Close the machine.

## Result

- ⇒ The machine is cleaned.



**Important!**

With single-shift operation and normal operating conditions clean the machine once a day, or more frequently if needed.

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## 16 Preventive Maintenance

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Maintenance includes cleaning and checking the BPS C1, as well as replacing worn-out parts.

Banknotes in circulation normally contain a high level of dirt that collects in the entire system as fine dust. Depending on the ambient conditions of the site, external influences can also lead to heavy soiling of the system.

Photo detectors and sensors are affected by soiling and the reject rate can increase.

To prevent malfunctions that are caused by soiling, it is recommended to clean the machine at regular intervals.

The cleaning in general has to be performed by the operator, see → *User Manual, section "Cleaning"*.

For preventive maintenance a cleaning interval of approximately 7 million banknotes or 12 months is recommended.

Any steps that are required for removing and replacing are described in the sections for parts replacement in this manual.

In the following table, you find as a suggestion a checklist for the preventive maintenance workflow.

### 16.1 Preventive Maintenance Workflow

## Preventive Maintenance Checklist

(Recommendation approx. 7 Mio Banknotes / 12 Months)

<b>Data to be Recorded before Starting the Service</b>	
<b>Software:</b>	<b>Version:</b>
UI Firmware:	
UI (Image):	
Main Firmware:	
FPGA:	
<b>Currency (ISO-code) and Version:</b>	
1	6
2	7
3	8
4	9
5	10
<b>General Overview</b>	
<b>Problems:</b>	Ask the customer if there are currently any problems with the machine
<b>Optical test:</b>	Check general status of the machine
<b>Initial test:</b>	Test machine with blanks/banknotes for correct operation before carrying out the stripdown and service
<b>Function test:</b>	Check singler, stacker, gate and photo detectors
Last preventive maintenance start date/Banknotes processed:	
Preventive maintenance start date/Banknotes processed:	
Next preventive maintenance start date/Banknotes processed:	
<b>General Service</b>	
1	Remove all external covers and remove toothed belt cover plate
2	Vacuum machine and inspect as per service details
3	Carry out upper and central transport checks, replace parts as necessary
4	Remove and vacuum out power supply assembly, carry out lower transport checks
5	Check operating unit
6	Install any software/adaptation updates as required
7	Carry out calibration procedure
8	Record data in the grey fields of this checklist
9	Test machine with "Simple Mode" procedure in Maintenance Mode
<b>Inspection</b>	
<b>Upper Transport Area</b>	
1	Check for damaged or loose parts
2	Vacuum Singler/Retard wheel area, check for damage/wear/debris, also check top section transport guide plate photo detectors for dust in chambers
3	Individually check all upper transport rollers (free wheeling rollers) in top module for movement and smooth operation
4	Individually check for wear and clean all dirt deposits from the middle module transport upper drive rollers. Otherwise dirt becomes caked on rollers.
5	Inspect IR sensor face for damage, dirt marks/streaks/deposits and clean
6	Clean the Mag Detector face plates ensuring all sticky black dirt deposits are removed
7	Loosen display and remove singler plastic cover, vacuum singler area and check for rubber bands/debris to prevent singling issues
8	Check and clean all transport photo detectors in upper transport area, check for dust in photo detector chambers!
9	Inspect CIS sensor face for damage and dirty marks/deposits and clean

Page 1 of 2

10	Check individual thickness sensor rollers for freedom of movement and no sticky/dirt deposits, this will affect the measurement
11	Transport brushes - Remove debris and clean brushes
12	Check lower transport area securing clamps for cracking
13	Check main transport drive toothed belt and cogs for wear/perishing/damage, replace as necessary
14	Check top cover handle for damage/cracking and replace if necessary
15	Clean and inspect all removed covers for damage prior to re-fitting
<b>Lower Transport Area</b>	
1	Vacuum the lower transport area, check for damaged or loose parts
2	Remove power supply assembly, remove the top cover plate from the power supply assembly and vacuum
3	Loosen display and remove singler cover, clean 'Banknotes present in Reject stacker' sensor, check+ vaccum inside the sensor housing
4	Individually check all lower module lower transport rollers (free wheeling rollers) for freedom of movement and smooth operation
5	Individually check for wear and clean all dirt deposits (Dirt becomes caked on rollers) from the middle module transport lower drive rollers
6	Clean all transport photo detectors, check the middle module lower transport plate photo detectors for dust in chambers, remove and clean if necessary
7	Transport sensor brushes - Remove debris and clean brushes
8	Check reject stacker flip plate springs for correct operation
9	Check correct operation of lower door pneumatics
10	Inspect and check gate for security/damage and for correct operation
11	Check gate operating tab for security/damage/bent and for correct operation into the sensor opening
12	Ensure timing wheel is clean and free from obstruction, check for security/damage and for correct operation
13	Check timing wheel toothed belt for damage/perishing
14	Check 'lower transport' release handles for correct operation
15	Check spirals for missing vanes, replace as necessary
16	Check security of mains switch and correct operation
<b>Display Area</b>	
1	Check with the operator for sticking/mal functioning keys!
2	If problems are reported, remove screen panel and separate membrane from PEC
3	Use Membrane cleaner to remove dirt deposits and inspect the membrane for damage/splitting.
4	Check screen for damage and dirt deposits and clean with soft lint free cloth
5	Re-assemble and check operation of all keyboard buttons for ease of movement
6	Clean and inspect keyboard for dirt deposits and clean as necessary
7	Refit screen panel taking care that the 2 securing screws are NOT overtightend and crack the mounts.
<b>Testing</b>	
1	Refit the power supply assembly removed in Trans Lower-2, then reassemble all panels back onto the machine
2	Carry out banknote gap friction test and use good quality blanks to check for good operation of the machine.
3	Enter the Maintenance Mode and carry out the Simple test to observe the quality of the singling.
4	Carry out any necessary software updates and also calibrate the sensors.

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## 17 Maintenance Mode

The following chapter describes the Maintenance Mode for the BPS C1.

The following service tasks can be performed in the Maintenance Mode.

- Checking singler settings in Simple Mode and Strict Mode
- Updating the machine
- Calibrating sensors
- Checking sensor status
- Checking machine function
- Requesting machine status
- Setting device parameters

The service menu is available on the operating unit.



### NOTICE

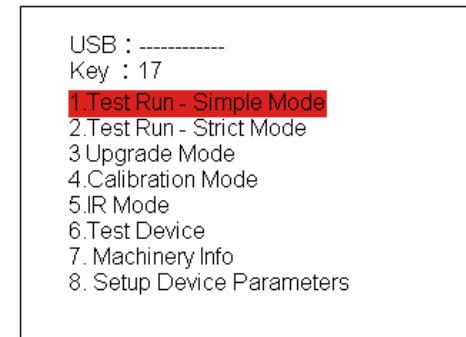
Risk of loss of data or settings

In the Maintenance Mode, improper use can result in loss of data or settings.

Work secure and follow the instructions properly.

#### Start Maintenance Mode

- [1] Use the power supply switch to switch on the machine.
- [2] Press the Keys **CUR** and **INFO** immediately and simultaneously.
- [3] Wait until the Maintenance Mode is displayed.
- [4] Insert the password ("000000").
- [5] Press the Enter key to confirm.  
⇒ The service menu is displayed.



[6] Use the following keys to navigate in the service menu.

- **Key 2**

Moves up the cursor one line.

- **Key 8**

Moves down the cursor one line.

- 

Enter key



Confirm selection/Start function.

- 

**C** key



Navigate menu level up.

- Select **EXIT**

Quit submenu/One menu level up.

## 17.1 Checking Sensor Status - Strict Mode

In the Maintenance Mode, the **Test Run - Simple Mode** and the **Test Run - Strict Mode** are available.

To check the sensor status before calibration, use the **Test Run - Strict Mode** only, because the other mode is available for historical reasons.

In the following, you find described the **Test Run - Strict Mode**.

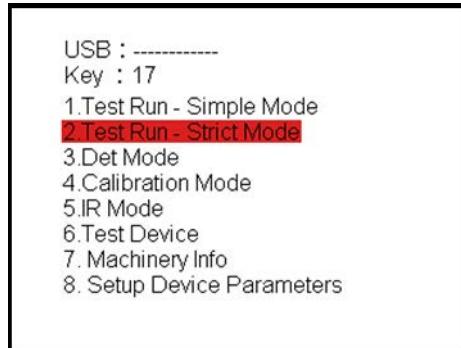
Requirement

A bundle with 100 banknotes of **best quality**.

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*

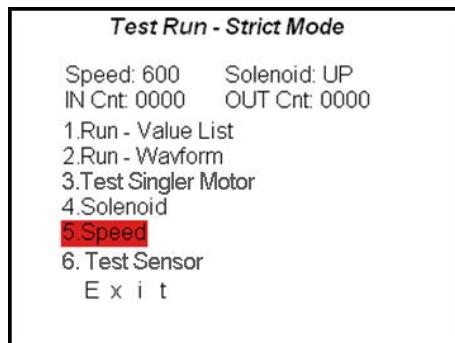


[2] Select **Test Run - Strict Mode** and press the Enter key.

⇒ The following functions are available:

- **Run Value List** - result displayed in numbers  
 This function is recommended and described because of a better presentation of the result.
- **Run Wavform** - result displayed in graphic form
- **Test Singler Motor**  
 Check of singler motor.
- **Solenoid**  
 Check of solenoid.
- **Speed**  
 Set test speed (600-1500)
- **Test Sensor**  
 Check sensor at the end of the run.

#### Setting Test Speed

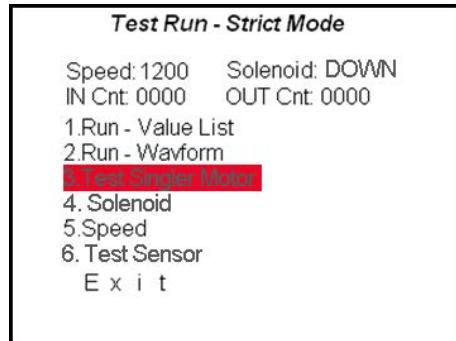


[3] Select **Speed**.

Select the most used operating speed or test with three different speed values (low, middle, high).

[4] Press the Enter key until the desired speed displayed.

## Test Singler Motor



[5] Select **Test Singler Motor**.

[6] Insert a bundle of 100 banknotes in the singler.

[7] Press the Enter key.

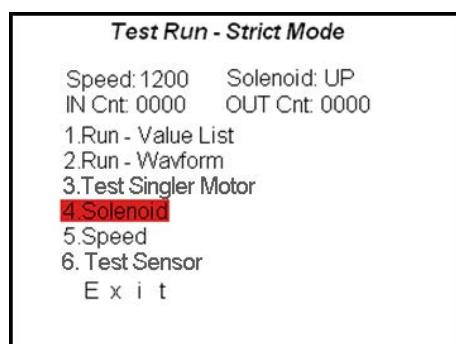
With this option, the function of singler motor and solenoid is checked. Alternately one banknote goes to the reject stacker and one to the delivery stacker until the bundle is processed.

⇒ The following results are shown:

- A green checkmark appears for successful test.  

- A red cross mark appears if the gate or the singler motor are not moving. Check the function of the solenoid/gate.  

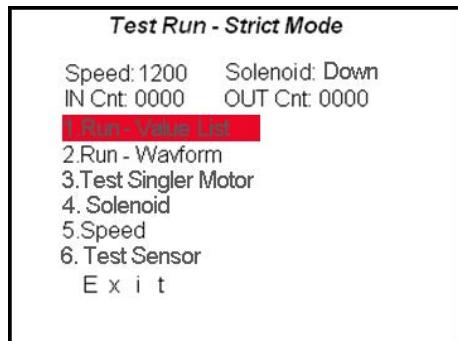

## Setting Solenoid Position



[8] Select **Solenoid**.

[9] Press the Enter key and select the value "Down".

## Starting the Test Run



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- [10] Select Run - Value List and press the Enter key.

## Inserting Banknotes

- [11] Insert the bundle of 100 test banknotes in the singler. Check a centered position.
- [12] To match the banknote size, adjust the banknote guide.  
 ⇒ The banknotes are fed in.  
 The sensor values are recorded.
- [13] Navigate in the windows do display all results.  
 ⇒ Check the result as follows.

- IN Cnt same as OUT Cnt

Test Run - Strict Mode					
Speed : 1200 Solenoid : Down			IN Cnt : 0100 OUT Cnt : 0100		
Name	Now	Min	Max	Ave	QTY
TiltA-L	0	1	3	1	58
TiltA-R	4	2	5	1	42
TiltB-L	0	1	2	1	63
TiltB-R	3	2	5	1	37
TiltC-L	0	1	2	1	64
TiltC-R	3	2	5	1	36
TiltD-L	0	1	3	1	85

Figure 50: Result - Values

- The maximum value (MAX) for Tilt(B)-(R&L) should not be greater than 7.
- The average values (Ave) should not be greater than 2.
- The difference quality values (QTY) should not be greater than 30.

Test Run - Strict Mode						
Speed : 1200			Solenoid : Down			
IN Cnt : 0100			OUT Cnt : 0100			
Name	Now	Min	Max	Ave	QTY	
Tilt-R	0	2	4	3	10	
LTO Dis	78	57	78	70	70	
A Dis	163	145	163	153	70	
B Dis	162	143	162	153	70	
C Dis	163	144	163	153	70	
D Dis	163	144	163	153	70	
LTO	81	78	90	82	70	

Figure 51: Result - Distances

- The minimum distance values for A,B,C, and D should be from 130 through 150.
- The average distance values for A,B,C, and D should be from 143 through 157.
- The further windows are not relevant and show redundant information only.

Test Run - Strict Mode						
Speed : 1200			Solenoid : Down			
IN Cnt : 0100			OUT Cnt : 0100			
Name	Now	Min	Max	Ave	QTY	
PD1L	0	2	4	3	10	
PD1R	78	57	78	70	70	
PD2	163	145	163	153	70	
PD3L	162	143	162	153	70	
PD3R	163	144	163	153	70	
PD4L	163	144	163	153	70	
PD4R	81	78	90	82	70	

Figure 52: Result - Third Window

Test Run - Strict Mode						
Speed : 1200			Solenoid : Down			
IN Cnt : 0100			OUT Cnt : 0100			
Name	Now	Min	Max	Ave	QTY	
LTO-pl	0	2	4	3	10	
LTO-pr	78	57	78	70	70	
CIS-pl	163	145	163	153	70	
CIS-pr	162	143	162	153	70	
A->B	163	144	163	153	70	
B->C	163	144	163	153	70	
C->D	81	78	90	82	70	

Figure 53: Result - Fourth Window

[14] Repeat → [11] five times.

#### Further Course of Action

[15] Do the following depending on the result.

[15a] **There Are Values Out of Range**

**[15a-1]** Adjust the singler gap if two or more results are not in the anticipated range of values.

→ *Section 14.1 "Adjusting the Singler Gap", p. 135*

**[15b] All Values Are in the Required Range.**

**[15b-1] Select Test Sensor.**

→ *Section 17.1.1 "Checking Sensor Status - Test Sensor", p. 157*

### 17.1.1 Checking Sensor Status - Test Sensor

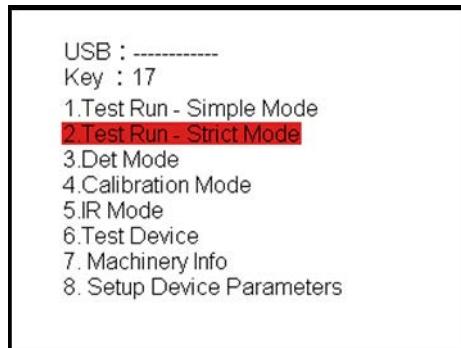
In the **Strict Mode** menu, the sensor status can be checked using sensor values.

#### Requirement

The following calibration media is available:

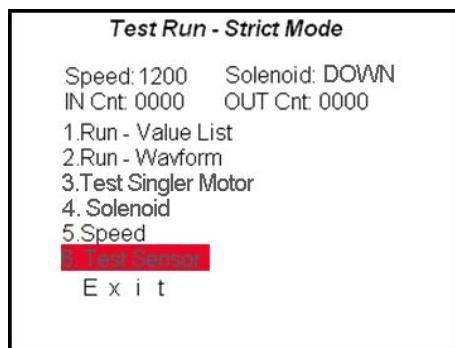
- Calibration set (Art.-No. 505027xx1)
- Paper calibration medium refill 25 pieces (Art.-No. 505009xx1)

#### Starting Test Run - Strict Mode



**[1]** Select **Test Run – Strict Mode** and press the Enter key.

#### Selecting Test Sensor



**[2]** Select **Test Sensor**.

⇒ The following start window is displayed.

<b>Test Run - Strict Mode</b>					
Speed : 600		Solenoid : Up			
IN Cnt : 0000		OUT Cnt : 0000			
Name	Now	Min	Max	Ave	QTY
	0	0	0	0	0

- [3] Insert ten paper blanks of the calibration media set in the singler.



**Important!**

The paper blanks should be clean, not folded and not damaged.

⇒ The result is displayed in several windows.

- Recommended values for **window 1**.

<b>Test Run - Strict Mode</b>					
Speed : 600		Solenoid : Up			
IN Cnt : 0001		OUT Cnt : 0001			
Name	Now	Min	Max	Ave	QTY
MG	5	5	5	5	0
nMG	0	0	0	0	0
MGRDJ	128	128	128	128	0
CIS1D	6	6	6	6	4
CIS2D	10	10	10	10	3
CIS-1	199	199	199	199	0
CIS-2	199	199	199	199	0

Figure 54: Result - Window 1

**MG:** Max<20

**nMG:** Max<20

**CIS1D:** Ave<15

**CIS2D:** Ave<15

**CIS-1:** 196<Ave<206

**CIS-2:** 196<Ave<206

- Recommended values for **window 2**.

Test Run - Strict Mode					
Speed : 600		Solenoid : Up			
IN Cnt: 0001		OUT Cnt: 0001			
Name	Now	Min	Max	Ave	QTY
CIS1X	5	5	5	5	0
CIS2X	6	6	6	6	0
P_LEN	157	157	157	157	0
G-1	180	180	180	180	0
G-2	180	180	180	180	0
IR-1	218	218	218	218	0
IR-2	225	225	225	225	0

Figure 55: Result - Window 2

**CIS1X:** Ave<15

**CIS2X:** Ave<15

**G-1:** Ave≈185 (value with minor deviations)

**G-2:** Ave≈185 (value with minor deviations)

**IR-1:** Ave≈225 (value with minor deviations)

**IR-2:** Ave≈225 (value with minor deviations)

- Recommended values for **window 3 and 4**.

Test Run - Strict Mode					
Speed : 600		Solenoid : Up			
IN Cnt: 0001		OUT Cnt: 0001			
Name	Now	Min	Max	Ave	QTY
T_RG	86	86	86	86	0
T_IR	86	86	86	86	0
MG-1	6	6	6	6	0
MG-2	7	7	7	7	0
MG-3	4	4	4	4	0
MG-4	4	4	4	4	0
MG-5	6	6	6	6	0

Figure 56: Result - Window 3

Test Run - Strict Mode					
Speed : 600		Solenoid : Up			
IN Cnt: 0001		OUT Cnt: 0001			
Name	Now	Min	Max	Ave	QTY
MG-6	5	5	5	5	0
MG-7	3	3	3	3	0
MT-1	13	13	13	13	0
MT-2	12	12	12	12	0
THS-H	101	101	101	101	1
THS-L	94	94	94	94	10
DIFF	7	7	7	7	12

Figure 57: Result - Window 4

**T\_RG:** Ave≈85 (value with minor deviations)

**T\_IR:** Ave≈85 (value with minor deviations)

- MG-1 to MG-7:** Max<20  
**MT-1, MT-2:** Max<20  
**DIFF:** Ave<15
- Recommended values for **window 5.**

<i>Test Run - Strict Mode</i>					
Speed : 600		Solenoid : Up			
IN Cnt : 0001		OUT Cnt : 0001			
Name	Now	Min	Max	Ave	QTY
pUV-0	255	255	255	255	52
rUV-1	253	253	253	253	0
rUV-2	230	230	230	230	0

Figure 58: Result - Window 5

**pUV-0:** Ave>185  
**rUV-1:** Ave>185  
**rUV-2:** Ave>185

## 17.2 Updating the Machine - Upgrade Mode

In the **Upgrade Mode** menu, the machine firmware can be updated with an SD card.

To upgrade the machine via SD card, carry out the following steps:

- → *Section 17.2.1 “Preparing the SD Card”, p. 160*
- → *Section 17.2.2 “Executing Upgrade Mode”, p. 161*

Update Language

In addition the update of installed languages with the SD card is provided, see → *User Manual, chapter "Language Switch by SD Card"* for more information.

### 17.2.1 Preparing the SD Card

You can create an SD card to update several machines.

## Requirements

- Commercial SD card with the following recommended details:
  - HW format: SDHC, C10 and C4
  - SW format: FAT32, 4096(4K)
  - Capacity: 4 GB - 16 GB
- The SD update file *BPSC1\_SD\_Upgrade\_Rel\_x\_x* as a packed file (.zip or .rar format)  
 You get the files from the download link that is given in the Quick Start Guide.

## Procedure

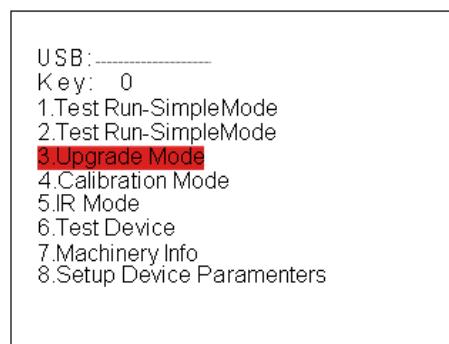
- [1] Download the file to a folder on your local PC.
- [2] Unpack the folder.  
 ⇒ A new folder *\_Upgrade* with subfolders has been created.
- [3] Copy the complete folder *\_Upgrade* to the top level of the SD card.  
 ⇒ You can update with this SD card all hardware variants.

### 17.2.2 Executing Upgrade Mode

Requirement SD card prepared with firmware

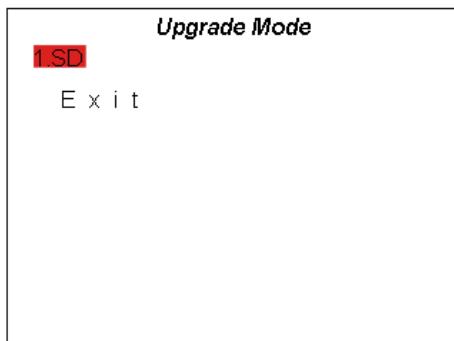
#### Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → Chapter 17 "Maintenance Mode", p. 151



- [2] Select **Upgrade Mode** and press the Enter key.
- [3] Insert the SD card into the appropriate slot on the rear of the machine.

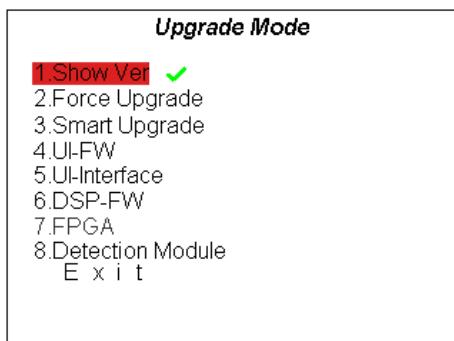
17



[4] Select **SD** and press the Enter key.

⇒ The SD card is recognized and ✓ appears.

#### Showing Available Versions



[5] Select **Show Ver.**

⇒ The available firmware versions on the machine and the SD card are shown in the display menu.

Upgrade Mode	
Model Type:	B P S C 1 F - B 0 3 I F
Factory Date:	2 0 1 5 / 0 5 / 0 3
Serial Number:	110099
Ui-Fw Ver:	002.016 ➔ 002.016
UI Ver:	000.000 ✘ 002.016
DSP Ver:	003.021 ➔ 003.021
FPGA Ver:	001.010 ➗ 001.011
USD	000.000 ➔ 001.008
EUR	D02.104 ➔ D02.104
GBP	D02.003 ➔ D02.003

Figure 59: Firmware Versions – Example 1

<b>Upgrade Mode</b>	
Model Type:	BPS C1F-B031F
Factory Date:	2014/04/17
Serial Number:	1001354
Ui-Fw Ver:	002.016 ➔ 002.016
UI Ver:	000.000 ✘ 002.016
DSP Ver:	003.019 ➔ 003.019
FPGA Ver:	001.012 ➤ 001.011
USD	001.008 ➔ 001.008
EUR	D02.104 ➔ D02.104
GBP	D02.003 ➔ D02.003

Figure 60: Firmware Versions – Example 2

17

The markings have the following meanings:

-  New version available on the SD card and update is possible.
-  No appropriate firmware on the machine
-  Version already installed on the machine
-  Version on the SD card not current

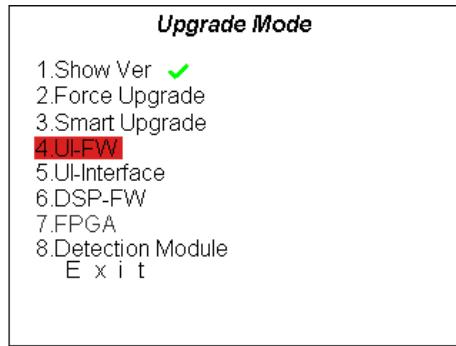
[6] Note the available components.

#### Selecting Upgrade Mode

[7] Use button **C** to go back to selection menu.

⇒ The following options are available.

- **2. Force Upgrade**  
Complete installation without check of available versions.
- **3. Smart Upgrade**  
Upgrade of lower versions installed with higher latest version available on SD card.
- **4. UI FW, 5. UI-Interface, 6. DSP-FW, 7. FPGA, 8. Detection Module**  
Upgrade of single, selected component.



[8] Mark the desired option and press the Enter key.

⇒ OK is displayed.

[9] Press Enter key again.

⇒ In addition to the selected component, ✓ appears.

The additional markings have the following meanings:

- ➔ Update in progress
- ✓ Update successful
- ✗ Update aborted

The update is, for example, aborted, if more currencies are on the machine as on the SD card.



#### Important!

When the marking ➔ for updating DSP-FW and FPGA is displayed, wait patiently after the marks ✓ or ✗ are displayed. If there is a breakdown, switch off the machine and repeat the procedure.

#### Restarting the Machine

[10] Switch off the machine after the complete update.

[11] Remove the SD card from the slot.

[12] Switch on the machine again.

### 17.3 Calibrating Sensors

The sensors of the machine can be calibrated in the **Calibration Mode** menu.

## Calibration Steps

The following calibration media is available:

- Calibration set (Art.-No. 505027001)  
(The set contains pieces of paper/plastic/MG paper medium.)
- Paper calibration medium refill 25 pieces (Art.-No. 505009001)

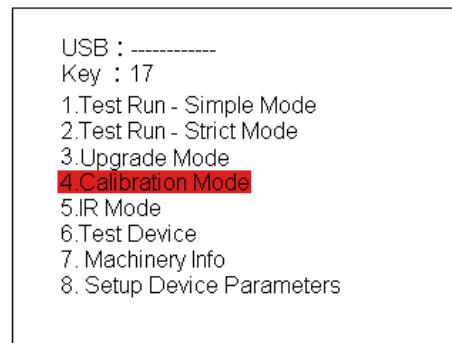
## Requirement

- Cleaning of singler has been performed.  
See → *User Manual, chapter "Cleaning"*.
- Singler is correctly adjusted.  
→ *Section 17.1 "Checking Sensor Status - Strict Mode", p. 152*
- **Sensor has to be cleaned extremely thoroughly!**
- Plastic calibration medium (cleaned)
- New paper medium
- MG calibration medium

## Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
→ *Chapter 17 "Maintenance Mode", p. 151*

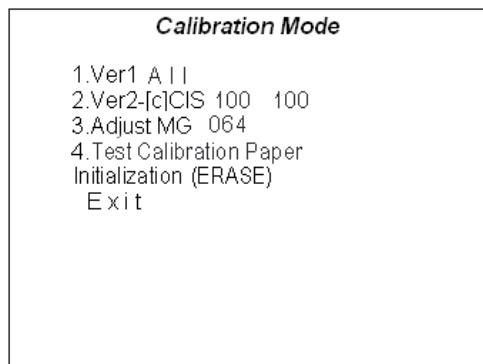
## Initializing Sensor



- [2] Select **Calibration Mode** and press the Enter key.  
⇒ The start menu for calibration appears.

**Important!**

With the following step, the calibration data of all sensors is deleted.



**[3]** Select **Initialization** and press the Enter key.

⇒ The following message is displayed:  
Yes(Start)/No(C)

**[4]** Do the following:

- Press the Enter key to start the initialization.
- Press C key to cancel the start.

**[5]** Do not touch the keys.

**[6]** Wait until initialization is completed.

⇒ The message "Init OK" appears.

## Calibrating CIS with Plastic Medium

**[7]** Open the upper module.

**[8]** Before inserting the calibration medium, note down the control factor that is printed on the calibration medium.

## Insert Plastic Calibration Medium

**Important!**

Always clean calibration medium before use.

**[9]** Insert the plastic calibration medium.



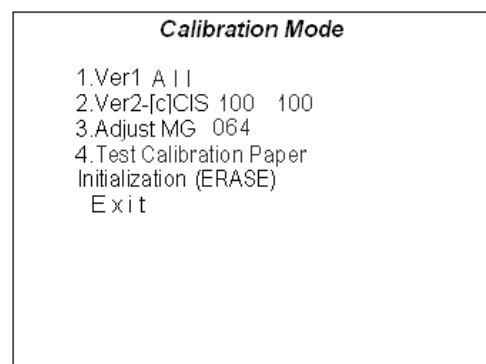
- [10] Insert the tip (1) of the calibration medium into the hole (2) of the side plate.



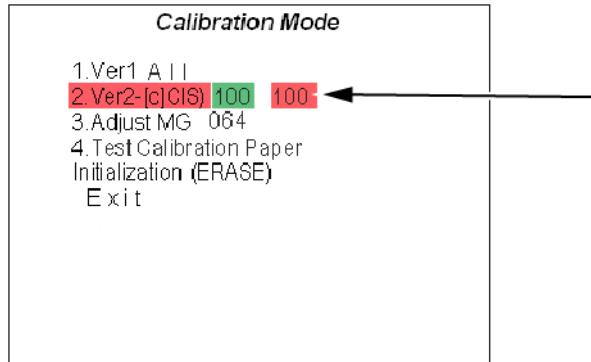
**Important!**

The glossy side must be upside.

- [11] Check the orientation of the calibration medium.  
 ⇒ The medium covers CIS assembly and light guide.
- [12] Close the upper module.



- [13] Select **Ver2-[c]CIS** and press the Enter key.



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- [14] Use key **2** or **8** to change the displayed **first** control factor for CIS1 (downside) according to the values on the calibration medium.  
 You have noted the factor that is printed on the calibration medium, see → [8].
- [15] Press the Enter key.
- [16] Use key **2** or **8** to change the displayed **second** control factor CIS2 (upside) according to the values on the calibration medium.  
 You have noted the factor that is printed on the calibration medium, see → [8].
- [17] Press the Enter key.  
 ⇒ Calibration starts.  
 →  
 A black arrow appears.

#### Result

- [18] Wait until calibration is completed.  
 ⇒ The following results are shown:
- A red cross mark with an error code appears.  
  
 The calibration is not successful.
    - Clean the CIS light guide thoroughly.
    - Start calibration again.
    - If the result is not successful again, replace the CIS assembly.
 Error codes:
    - 10, red light is broken

- 11, green light is broken
- 12, blue light is broken
- 13, IR light is broken
- 24, transmission red light is broken
- 25, transmission green light is broken
- 26, transmission blue light is broken
- 27, transmission IR light is broken
- 80, unknown error caused by software bug
- 81, certain component of circuit board A is broken
- 82, no black reference on CIS
- 255, no response from main firmware
- A green checkmark appears.



The calibration is completed successful.

- [19] Open the upper module.
- [20] Remove the plastic calibration medium.
- [21] Keep the calibration medium clean. Put the calibration medium back in the case.

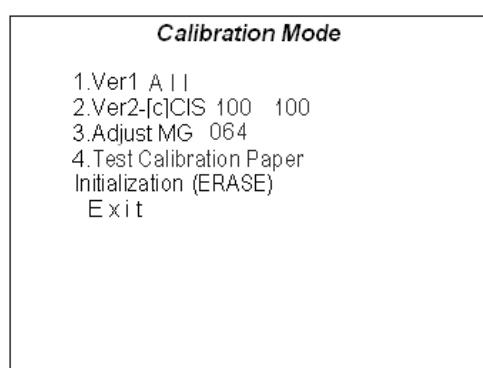
#### Calibrating THS and UV with Paper Medium



#### Important!

Use clean and smooth paper calibration media.

- [22] Close the upper module.



- [23] Select **Ver1 All** and press the Enter key.
- [24] Press the Enter key again to enter the Calibration Mode.

## Insert Paper Calibration Medium

<b>Calibration Mode</b>			
Total ch:	14		
ch	Name	Err Code	
00	C I S 3	000000000	
01	C I S 2	000000000	
02	L T 0	000000000	
03	M G	000000000	
04	M G	000000000	
05	M G	000000000	
06	M G	000000000	
07	M G	000000000	
08	M G	000000000	
09	M G	000000000	

- [25] Place the paper calibration medium in the singler slowly one by one.

⇒ The machine runs up.

The sensor status is displayed.

<b>Calibration Mode</b>			
Total ch:	14		
ch	Name	Err Code	
00	C I S 3	000000000	
01	C I S 2	000000000	
02	L T 0	000000000	
03	M G	000000000	
04	M G	000000000	
05	M G	000000000	
06	M G	000000000	
07	M G	000000000	
08	M G	000000000	
09	M G	000000000	

Yellow lines show that the calibration is ongoing.

<b>Calibration Mode</b>			
Total ch:	14		
ch	Name	Err Code	
10	T H S	00000001	
11	M T	00000000	
12	M T	00000000	
13	U V	00000052	

Red lines show errors during calibration.

Error codes:

- CIS
  - 0x100, problem with red light of CIS
  - 0x101, size of paper is not suitable; dirty paper or the light of CIS is too dark

- 0x103; problem with IR light of CIS
- 0x222; paper skew
- 0x333; redo static CIS calibration
- THS
  - 0x001; channel of sensor THS is broken
- Example:  
0x00000004 means channel 4 of sensor THS is broken
- 0x555; paper skew
- UV
  - 0x1 - 0xff; DAC value, continued self-calibration
  - 0x775; DAC value out of range
  - 0x776; DAC value out of range
  - 0x777; redo calibration
  - 0x778; no response from sensor UV
  - 0x800; DAC=0

#### Insert Paper Calibration Medium Again

[26] Place paper calibration medium in the singler again.

⇒ The machine runs up.

The sensor status is displayed.

#### Result

[27] Repeat the step several times until the menu is displayed without red error lines and OK on the bottom of the window.

⇒ The sensor is calibrated, if the following results are displayed.

Calibration Mode		
Total ch: 14		
ch	Name	Err Code
00	CIS3	0000000000
01	CIS2	0000000000
02	LTO	0000000000
03	MG	0000000000
04	MG	0000000000
05	MG	0000000000
06	MG	0000000000
07	MG	0000000000
08	MG	0000000000
09	MG	0000000000

Figure 61: Calibration - OK - First Window

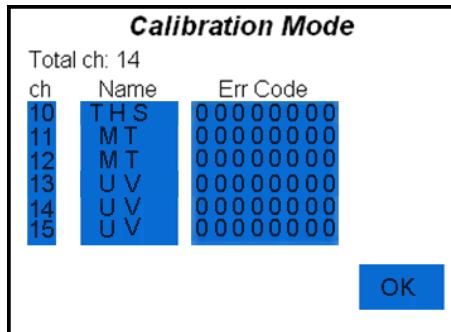
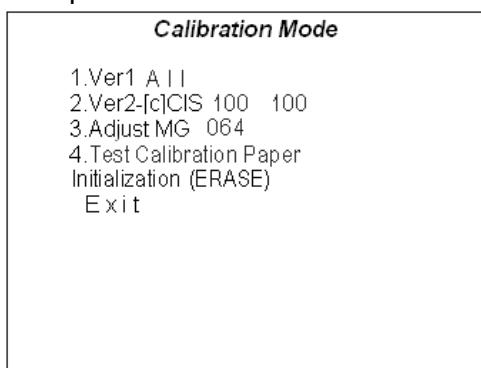


Figure 62: Calibration - Ok - Second Window

## Calibrating MG Sensor with MG Paper



- [28] Select **Ver1 All** and press the Enter key.
- [29] Select **MG** and press the Enter key.
- [30] Loosen the gap (turn around gap screw clockwise two blocks).
- [31] Take eight papers and process the papers.

**Important!**

Make sure to feed the paper in the middle of the hopper. Use the hopper guide.

⇒ After a successful calibration, **OK** will be displayed.

- [32] After a successful calibration, press the **C** key to go back to the previous page.
- [33] Check the "AdjustMG" value.  
The acceptable value is 50 ~ 120. (+-10 tolerance). If the value is out of range, check the position of the magnetic sensor MT/MRS. → *Section 14.5 “Adjusting Magnetic Sensor MT or MRS”, p. 140*  
Check the quality of the test medium.

## 17.4 Checking Sensor Status - IR Mode

In the **IR Mode** menu, the status and functionality of the sensors can be checked after replacing or concerning dust accumulation.

The sensor status check comprises the following possibilities.

- Checking sensor function: Only for transport photo detectors
- Checking return value: Only for transport photo detectors
- Checking sensor status: For all photo detectors

### 17.4.1 Checking Sensor Function (Light Test)

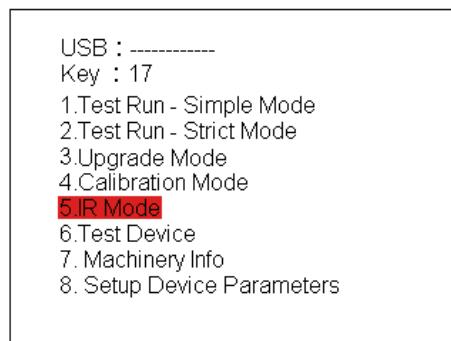
The influence of ambient light is tested.

For devices from serial number T1117952 and M0300001 and higher only.

Starting Maintenance Mode

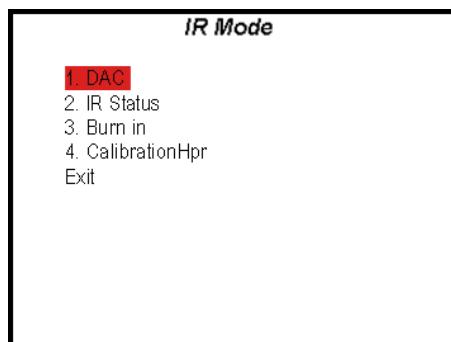
- [1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*



- [2] Select **IR Mode** and press the Enter key.

Checking Return Value

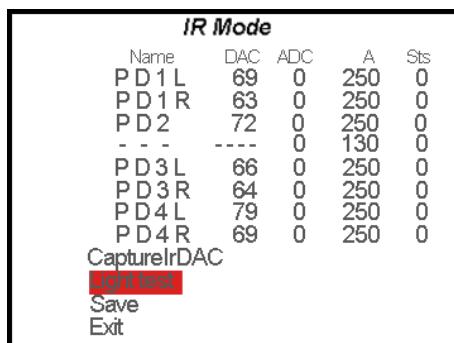


- [3] Select **DAC** and press the Enter key.

⇒ The last saved values are displayed in die DAC column.

[4] Select **CaptureIrDAC** and press the Enter key.

⇒ Clean the sensor, if no green checkmarks are displayed.



[5] Select **Light test** and press the Enter key.

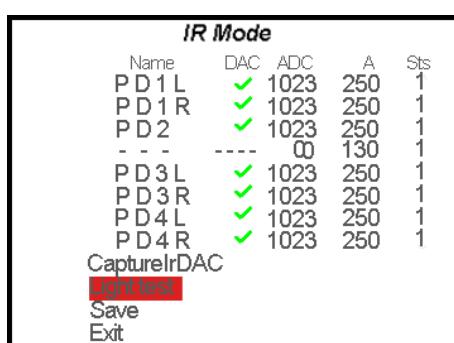
[6] Open the upper and the middle module.

[7] Again press Enter key.

⇒ The following results can be displayed:

- A green checkmark is displayed for successful test.  

- A red cross or a black arrow is displayed for not successful test.  

[8] Select **Save** to save the result.

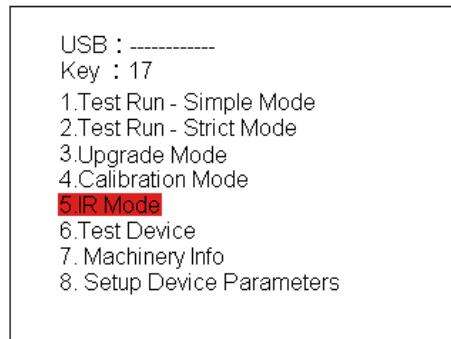
[9] Select **Exit**.

#### 17.4.2 Checking Sensor Return Values

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 “Maintenance Mode”, p. 151*

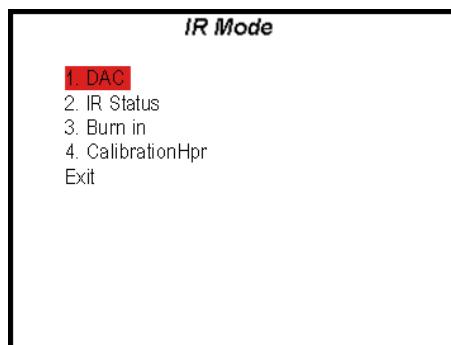


17

**[2] Select IR Mode.**

**[3] Press Enter.**

Checking Return Value



**[4] Select DAC.**

IR Mode					
Name	DAC	ADC	A	Sts	
P D 1 L	69	0	250	0	
P D 1 R	63	0	250	0	
P D 2	72	0	250	0	
- - -	----	0	130	0	
P D 3 L	66	0	250	0	
P D 3 R	64	0	250	0	
P D 4 L	79	0	250	0	
P D 4 R	69	0	250	0	
<b>CaptureIrDAC</b>					
Light test					
Save					
Exit					

**[5] Select CaptureIrDAC.**

**[6] Press Enter key.**

⇒ The check is started and takes some seconds.

The sensor values are displayed.

<b>IR Mode</b>					
Name	DAC	ADC	A	Sts	
PD 1 L	69	0	250	0	
PD 1 R	63	0	250	0	
PD 2	72	0	250	0	
- - -	- - -	0	130	0	
PD 3 L	66	0	250	0	
PD 3 R	64	0	250	0	
PD 4 L	79	0	250	0	
PD 4 R	69	0	250	0	

**CaptureIrDAC**  
Light test  
Save  
Exit

- [7] The values should be less than 127.  
If the DAC value of a sensor PD is equal or greater than 127 do the following:
- Verify that there are no banknotes in the banknote guide.
  - Clean the sensors.
  - Select **CaptureIrDAC** again.
  - Replace the affected sensor if the error remains.
- [8] Continue with → *Section 17.4.3 “Checking Sensor Status”, p. 176.*

#### 17.4.3 Checking Sensor Status

The intensity of light from the emitter is tested.

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
→ *Chapter 17 “Maintenance Mode”, p. 151*

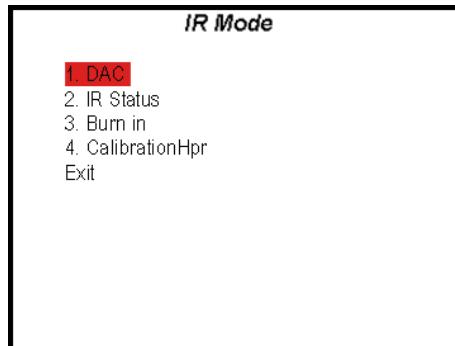
USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
<b>5.IR Mode</b>
6.Test Device
7. Machinery Info
8. Setup Device Parameters

- [2] Select **IR Mode**.

- [3] Press Enter.

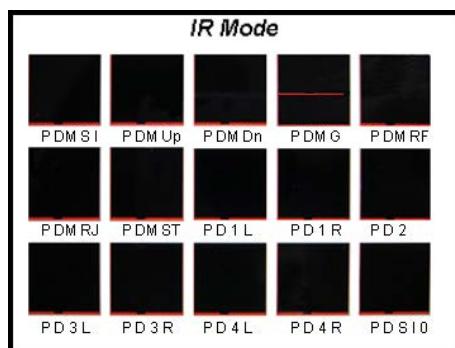
Checking Sensor Status  
Requirement

The upper and lower modules are closed.



[4] Select **IR Status**.

[5] Press Enter key.



[6] Check the sensor status in the menu.

⇒ The curves must be in the minimum.

Except PDMG and PDSIO.

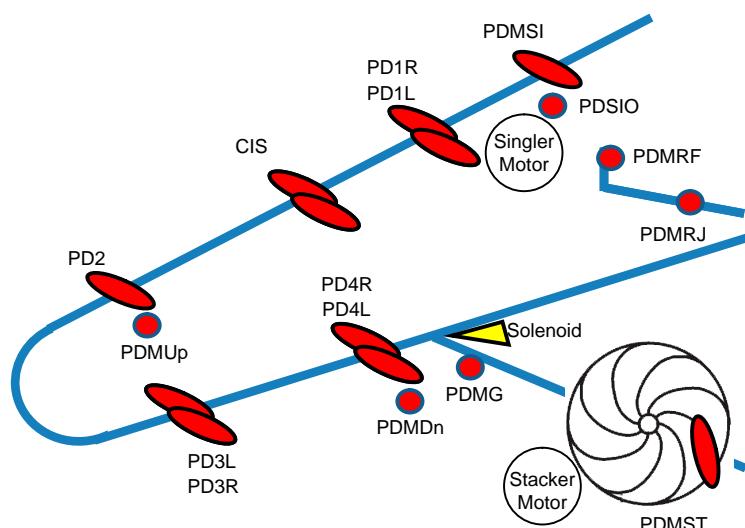
PDMG is high or low depending on the solenoid position (Up or Down).

PDSIO is high or low depending on the singler shaft pin position. When the singler shaft pin enters the encoder, the curve shows high value. Open the upper section and move the feeder rollers to check the function.

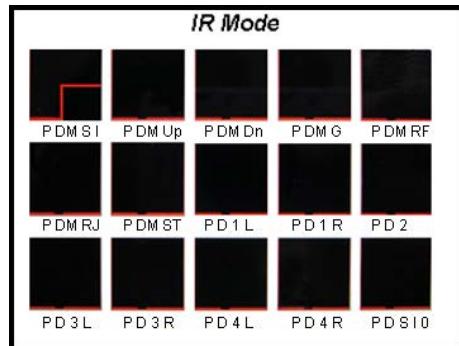
#### Legend

- **PDM<sub>SI</sub>** (circuit board FFT)  
Photo detector singler
- **PDM<sub>Up</sub>** (circuit board MIO)  
Upper module open (bill path open)
- **PDM<sub>Dn</sub>** (circuit board BCD)  
Lower module open (conveyor path open)
- **PDM<sub>G</sub>** (circuit board BSP)  
Position gate open - photo detector monitoring gate

- **PDMRF** (circuit board RJI)  
Position gate closed - photo detector monitoring reject full
- **PDMRJ** (circuit board RJD)  
Photo detector monitoring reject stacker
- **PDMST** (Circuit board STE (emitter); STR (receiver) mounted in the stacker)  
Photo detector monitoring delivery stacker
- **PD1L, PD1R** (circuit boards TT0/TT1)  
Upper photo detectors (bill path)
- **PD2** (circuit board TUV)  
Upper photo detectors (bill path)
- **PD3L, PD3R, PD4L, PD4R**  
Lower photo detectors (conveyor path)
- **PDSIO** (circuit board MFE)  
Photo detector for singler zero position



[7] Open the upper module.



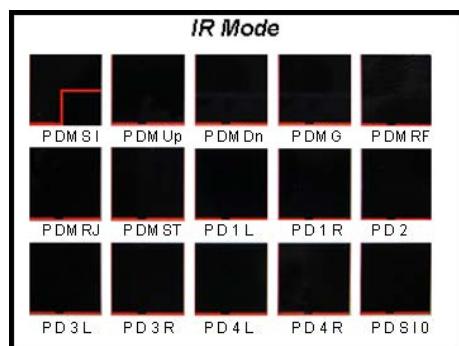
[8] Check the sensor status in the menu.

⇒ An increased value is displayed for the following photo detectors.

- PDMUp  
Display "Upper module opened"
- PD1L, PD1R, PD2  
Upper photo detectors

[9] Close the upper module.

[10] Open the lower module.



[11] Check the sensor status in the menu.

⇒ An increased value is displayed for the following curves.

- PD3L, PD3R, PD4L, PD4R  
Lower photo detectors
- PDMDn  
Display "Lower module opened"
- PDMRJ  
Sensor "Reject stacker full" opened

If PDMRJ does not show high values on opening the upper section, block the sensor manually and check again.

⇒ The sensor check is completed.

#### 17.4.4 Performing Continuous Operation (BPS C1 D only)

For new machines, continuous operation for sensors and LEDs is possible.

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
**5.IR Mode**  
 6.Test Device  
 7. Machinery Info  
 8. Setup Device Parameters

[2] Select **IR Mode**.

[3] Select **BurnIn**.

[4] Select the preferred run time in hours.

[5] Press Enter key.

⇒ The continuous test starts.

- Sensors and LEDs are switched on one after another.
- The elapsed time is displayed to the operating panel.

### 17.5 Checking Machine Function - Test Device

In the **Test Device** menu, test functions for machine components are available.

If the test result is negative, replace the component in question.

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ Chapter 17 “Maintenance Mode”, p. 151

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

**[2] Select Test Device.**

⇒ For the functions, a **three-page menu** is available.

### 17.5.1 Checking Solenoid Switch Cycles

Starting Maintenance Mode

**[1] Start the Maintenance Mode.**

→ Chapter 17 “Maintenance Mode”, p. 151

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

**[2] Select Test Device.**

**Test Device**

USB : -----  
 Key : 0 Speed : 600  
**1.Solenoid**  
 2.Singler Motor Stop  
 3.Singler Motor Start  
 4.Set Motor Speed  
 5.Motor Run  
 6.Test LCD  
 7.Test UART 1  
 8.Test UART 2

**[3] Select Solenoid.**

## Starting Solenoid Test

- [4] Press the Enter key.
- ⇒ The solenoid test runs automatically for 20 switch cycles within 14 ms.  
 During the test, you can hear the noise of the solenoid gate.  
 The following screen is displayed.

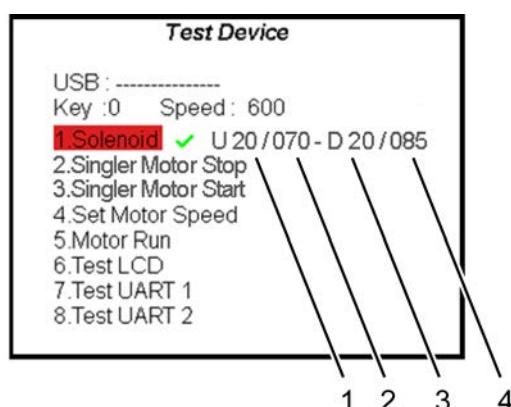
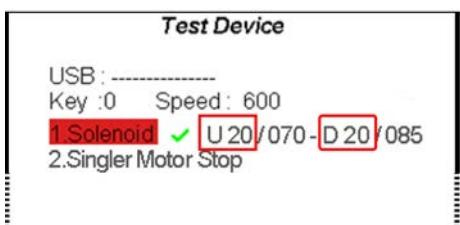


Figure 63: Result Solenoid Test

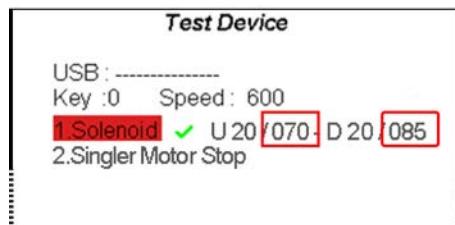
- 1 Number of switch cycles for solenoid up
- 2 Value for solenoid up
- 3 Number of switch cycles for solenoid down
- 4 Value for solenoid down

## Checking Result

- [5] Check the values that are displayed.
- ⇒ The result is divided into two parts.
1. **Switch cycle values**
- 
- The screenshot shows the 'Test Device' menu with the following text:  
 USB : -----  
 Key :0 Speed : 600  
 1.Solenoid ✓ U 20/070 - D 20/085  
 2.Singler Motor Stop
- If 20 or 19 switch cycles are executed within 14 ms, a green checkmark is displayed.  
 If 18 cycles or less are executed, a red cross is displayed.  
 See the examples below.  
 – ✓ For U 20 and D 20

- ✓ For U 19 and D 20
- ✓ For U 20 and D 19
- ✗ For U 18 and D 20
- ✗ For U 20 and D 18

## 2. Solenoid values



The values for solenoid up and solenoid down are displayed.

The range for solenoid up value is from 045 through 090.

The range for solenoid down value is from 070 through 115.

For example, the displayed value 080 means 8.0 ms.

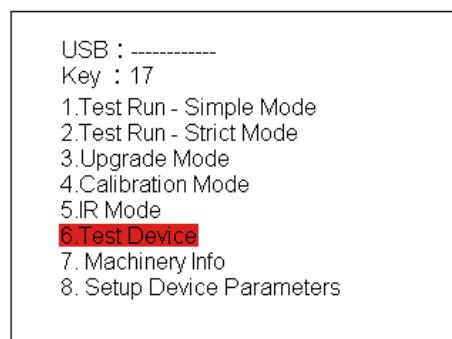
If the values are not in the correct range, something that is stuck in the mechanical part, one screw is loosened, or the solenoid is defective.

### 17.5.2 Stopping Singler Motor

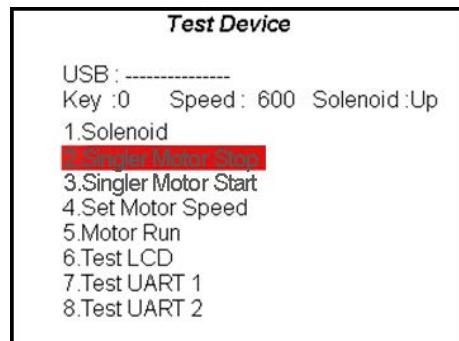
Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ Chapter 17 "Maintenance Mode", p. 151



[2] Select **Test Device**.

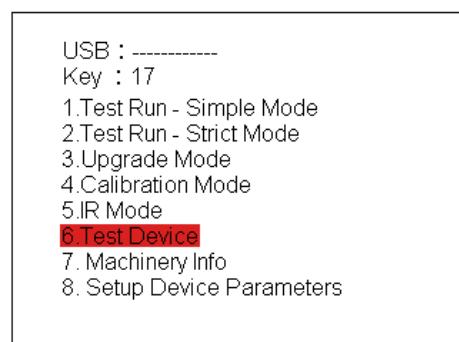


- [3] Select **Singler Motor Stop**.
- [4] Press the Enter key.
- ⇒ If the singler motor is running, the motor stops.

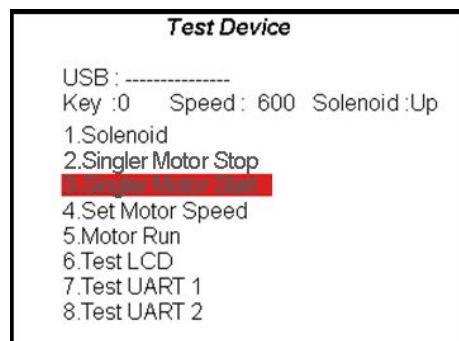
### 17.5.3 Starting Singler Motor

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*



- [2] Select **Test Device**.



- [3] Select **Singler Motor Start**.
- [4] Press the Enter key.

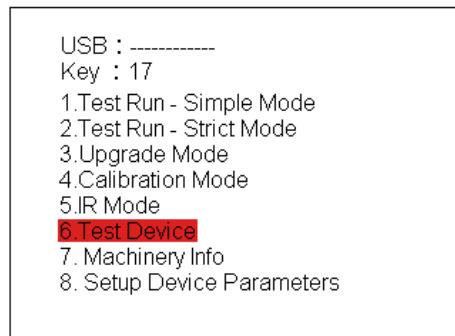
- ⇒ The singler motor together with the feeder rollers start running.

#### 17.5.4 Changing Motor Speed

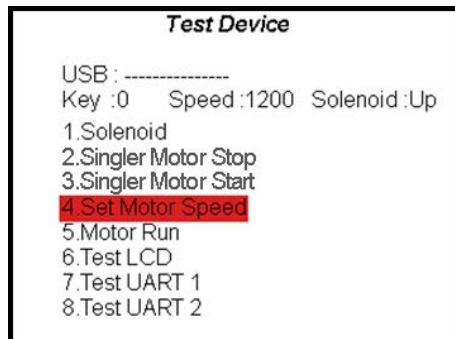
For test purposes, you can alter the motor speed.

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*



- [2] Select **Test Device**.



- [3] Select **Set Motor Speed**.

- [4] Press the Enter key until the desired speed is displayed.  
 [5] After the motor test, set the standard value.  
 600 rpm.

#### 17.5.5 Checking Motor and Stacker Wheel

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

**[2] Select Test Device.**

**Test Device**  
 USB : -----  
 Key :0 Speed: 600 Solenoid:Up  
 1.Solenoid  
 2.Singler Motor Stop  
 3.Singler Motor Start  
 4.Set Motor Speed  
**5.Motor Run**  
 6.Test LCD  
 7.Test UART 1  
 8.Test UART 2

**[3] Select Motor Run.**

**[4] Press the Enter key.**

- ⇒ The motor and the stacker wheel are running.  
 The display changes from **Motor Run** to **Motor Stop**.  
 The feeder roller should not move.

Stopping Motor

**Test Device**  
 USB : -----  
 Key :0 Speed: 600 Solenoid:Up  
 1.Solenoid  
 2.Singler Motor Stop  
 3.Singler Motor Start  
 4.Set Motor Speed  
**5.Motor Stop**  
 6.Test LCD  
 7.Test UART 1  
 8.Test UART 2

**[5] Select Motor Stop.**

- ⇒ The motor and the stacker wheel stop.

**[6] Carry out Steps → [3] to → [5] at different speeds.**

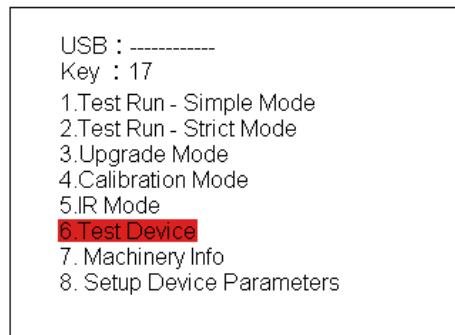
**[7] After the motor test, set the standard value.**

600 rpm.

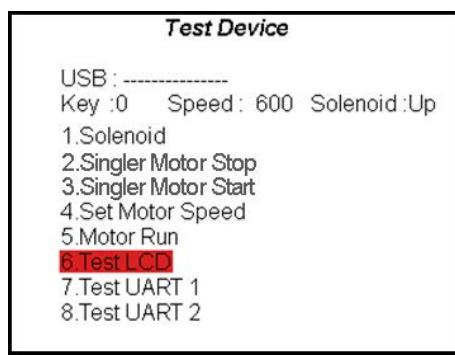
### 17.5.6 Checking Screen

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*



- [2] Select **Test Device**.



- [3] Select **Test LCD**.

- [4] Press the Enter key.

⇒ The screen is displayed in sequence in red, green, and blue. Afterwards, the menu **Test Device** is displayed.

### 17.5.7 Checking Interfaces

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

**[2] Select Test Device.**

Selecting Interface

**Test Device**  
 USB : -----  
 Key : 0 Speed : 600  
 1.Solenoid  
 2.Singler Motor Stop  
 3.Singler Motor Start  
 4.Set Motor Speed  
 5.Motor Run  
 6.Test LCD  
**7.Test UART 1**  
 8.Test UART 2

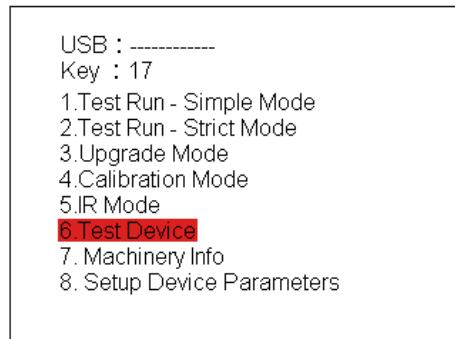
**[3] Select one of the following (see also next window):**

- **Test UART 1**  
 Checking COM1
- **Test UART 2**  
 Checking COM2 with printer
- **Test UART 3**  
 Checking external display all digits

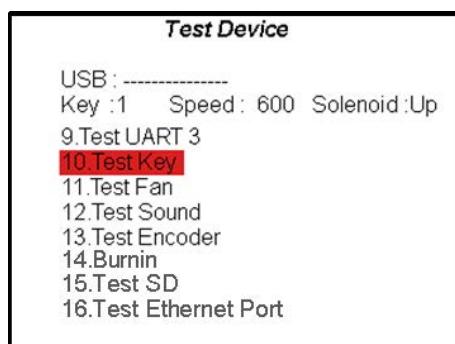
### 17.5.8 Checking Key

Starting Maintenance Mode

- [1]** Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*

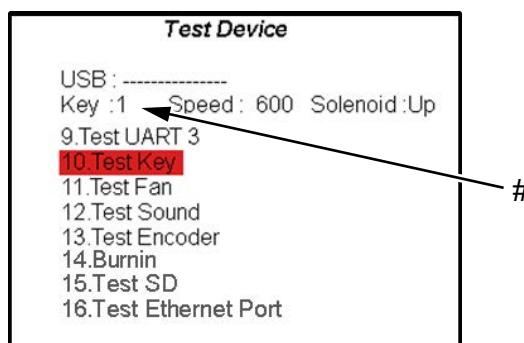


**[2] Select Test Device.**



**[3] Select Test Key.**

**[4] Press each key on the operating unit.**



**[5] Check whether for each key the displayed number (#) matched the information in the following table.**

Key	#	Key	#	Key	#	Key	#
Cancel (Left)	= 8	PRNT	= 7	4	= 13	0	= 20
Start (Left)	= 3	F1	= 9	5	= 18	GT	= 24

Key	#	Key	#	Key	#	Key	#
CUR	= 4	F2	= 10	6	= 22	Cancel (Right)	= 16
INFO	= 6	F3	= 11	7	= 14	Start (Right)	= 25
ADD	= 1	1	= 12	8	= 19		
RJCT	= 5	2	= 17	9	= 23		
SET	= 2	3	= 21	BAT	= 15		

### 17.5.9 Checking Fan

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ Chapter 17 “Maintenance Mode”, p. 151

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

[2] Select **Test Device**.

**Test Device**  
 USB : -----  
 Key :19 Speed : 600 Solenoid :Up  
 9.Test UART 3  
 10.Test Key  
**11 Test Fan**  
 12.Test Sound  
 13.Test Encoder  
 14.Burnin  
 15.Test SD  
 16.Test Ethernet Port

[3] Select **Test Fan** and press the Enter key.

[4] Hold a thin paper strip up to the ventilation slit on the rear of the machine.

⇒ The paper strip moves away from the machine. The air-flow comes out of the machine. The fan is working.

- [5] Press the Enter key again.

⇒ The fan stops.

### 17.5.10 Checking Sound

Starting Maintenance Mode

- [1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.**Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

- [2] Select **Test Device**.

**Test Device**  
 USB : -----  
 Key : 19 Speed: 600 Solenoid:Up  
 9.Test UART 3  
 10.Test Key  
 11.Test Fan  
 12.**Test Sound**  
 13.Test Encoder  
 14.Burnin  
 15.Test SD  
 16.Test Ethernet Port

- [3] Select **Test Sound** and press the Enter key.

⇒ You can hear the test sound.

### 17.5.11 Checking Main Motor Encoder

Requirement

Set the motor speed to 600 rpm.

→ *Section 17.5.4 "Changing Motor Speed", p. 185*

Starting Maintenance Mode

- [1] Start the Maintenance Mode.

→ Chapter 17 “Maintenance Mode”, p. 151

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

**[2] Select Test Device.**

**Test Device**  
 USB : -----  
 Key :19 Speed : 600 Solenoid :Up  
 9.Test UART 3  
 10.Test Key  
 11.Test Fan  
 12.Test Sound  
**13.Test Encoder**  
 14.Burnin  
 15.Test SD  
 16.Test Ethernet Port

**[3] Select Test Encoder and press the Enter key.**

⇒ The motor runs for a while and then stops.

**Test Device**  
 USB : -----  
 Key :19 Speed : 600 Solenoid :Up  
 9.Test UART 3  
 10.Test Key  
 11.Test Fan  
 12.Test Sound  
**13.Test Encoder** 6864  
 14.Burnin  
 15.Test SD  
 16.Test Ethernet Port

**[4] Check whether the value displayed is in the indicated range (see the following table).**

Speed	Value Range
600 rpm	5400 – 7200
1200 rpm	10800 – 13200

<b>Speed</b>	<b>Value Range</b>
1500 rpm	13500 – 16500

- [5] Perform the test for speeds 1200 rpm and 1500 rpm.
- [6] Repeat steps → [3] to → [4].

### 17.5.12 Performing Continuous Operation

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7. Machinery Info  
 8. Setup Device Parameters

- [2] Select **Test Device**.



**Important!**  
 Function for factory test only.

**Test Device**

USB : -----  
 Key :1 Speed : 600 Solenoid :Up  
 9.Test UART 3  
 10.Test Key  
 11.Test Fan  
 12.Test Sound  
 13.Test Encoder  
 14.BurnIn  
 15.Test SD  
 16.Test Ethernet Port

- [3] Select **BurnIn**.
- [4] Select the preferred run time.
- [5] Press the Enter key.
- ⇒ Continuous operation starts.

- All mechanical components are switched on and off.
- All mechanical components run.
- The elapsed time is displayed to the operating panel.

### 17.5.13 Test SD Card

Starting Maintenance Mode

17

- [1] Start the Maintenance Mode.

→ Chapter 17 “Maintenance Mode”, p. 151

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

- [2] Select **Test Device**.

**Test Device**  
 USB : -----  
 Key :1 Speed : 600 Solenoid :Up  
 9.Test UART 3  
 10.Test Key  
 11.Test Fan  
 12.Test Sound  
 13.Test Encoder  
 14.Burnin  
**15.Test SD**  
 16.Test Ethernet Port

- [3] Select **Test SD** and press the Enter key.

⇒ Continuous operation starts.

The following results are given:

-  SD card read successful
-  SD card read with failure

### 17.5.14 Test Ethernet Port

The Ethernet port is tested.

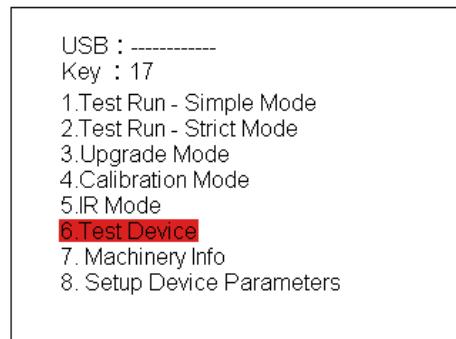
**Requirement**

Insert service Ethernet cable (jumper implemented) into the Ethernet port.

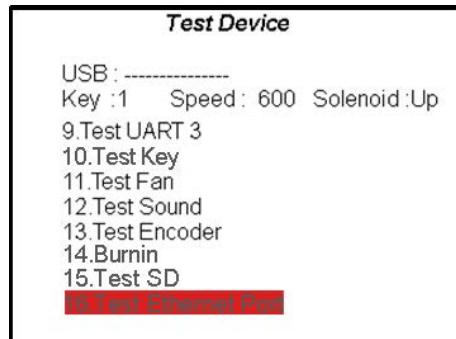
**Starting Maintenance Mode**

[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*



[2] Select **Test Device**.



[3] Select **Test Ethernet Port** and press the Enter key.

⇒ Continuous operation starts.

A ping signal is sent via LAN cross cable.

The following results are given:

-  Connection available
-  No connection available

### 17.5.15 Test Kicker Home

The kicker sensor is tested and the speed of motor is calibrated.

**Starting Maintenance Mode**

[1] Start the Maintenance Mode.

→ Chapter 17 “Maintenance Mode”, p. 151

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
**6.Test Device**  
 7. Machinery Info  
 8. Setup Device Parameters

**[2] Select Test Device.**

**Test Device**  
 USB : -----  
 Key : 1 Speed : 600 Solenoid : Up  
**7.Test Kicker Home**  
 18.Exit

**[3] Select Test Kicker Home and press the Enter key.**

⇒ Continuous operation starts.

The following results are given:

-  Test is ok
- ->: Calibration failed
-  Sensor is broken

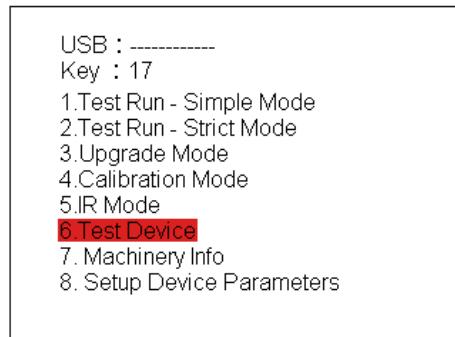
### 17.5.16 Test Motor Adjustment of Stepper Motor

The motor speed calibration of stepper motor is tested.

Starting Maintenance Mode

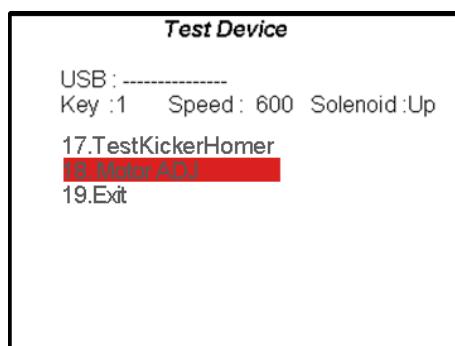
**[1] Start the Maintenance Mode.**

→ Chapter 17 “Maintenance Mode”, p. 151



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**[2] Select Test Device.**



**[3] Select Motor ADJ and press the Enter key.**

⇒ Continuous operation starts.

The following results are given:

- Test is ok
- :

The circuit board BLD is not working properly.

Check the version of the circuit board or replace the board.

## 17.6 Request the Machine Status - Machinery Info

In the **Machinery Info** menu, you can find information about the machine status.

Starting Maintenance Mode

**[1] Start the Maintenance Mode.**

→ *Chapter 17 "Maintenance Mode", p. 151*

## Display Machinery Info

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
**7. Machinery Info**  
 8. Setup Device Parameters

[2] Select **Machinery Info** and press the Enter key.

⇒ The following information is displayed.

- Machine type
- Date of manufacture
- Serial number
- Firmware version status
- Banknote counter
- Operating time in minutes (9 digits)

**Machinery Info**

Model Type:	B P S C 1 F - B 0 1 M E
Factory Date:	2014/04/08
Serial Number:	101191
MAC:	0 0 :9 0 :D 3 :0 8 :0 D :0 D
IPv4:	192:168:200:003
MASK:	255:255:255:000
GW:	192:168:200:003
Ui FW Ver:	003.031
Ui Ver:	005.004
DSP Ver:	002.023
FPGA Ver:	002.033
Cnt:	00000000000 000-000

**Machinery Info**

Operating Time:	000000222
IN R	002.025
EUR	F02.102
USD	F02.038

[3] To exit the menu, press **C**.

### 17.6.1 Print Machinery Info

#### Print Machinery Info

In the system menu, you can print the overall information of the machine, installed software, LAN interface, and installed currencies in the machine.

##### Print Machinery Info

- [1] Press **SET** on the operating unit.  
⇒ The system menu opens.
- [2] Select **Information of System** symbol .
- [3] Press **F3**.
- [4] Select the desired option with the numerical keypad.
- [5] Press **F3**.  
⇒ The selected information is printed on the connected printer.

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## 17.7 Setting Device Parameters

You can change machine settings in the **Setup Device Parameter** menu.

You can also reset all settings to the default values.

##### Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
→ *Chapter 17 "Maintenance Mode", p. 151*

**Important!**

Do not change the default settings if possible.

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
**8.Setup Device Parameters**

**[2]** Select **Setup Device Parameter** and press the Enter key.

⇒ For the settings, a two-page menu is available.

**Setup Device Parameters**

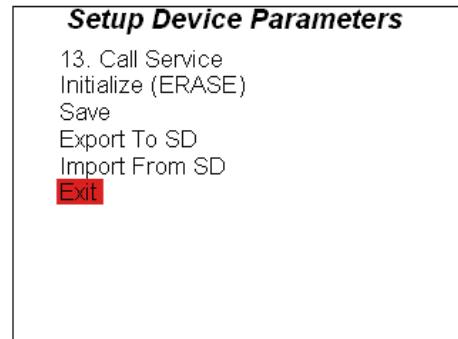
1.Pocket Up Max	200
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
12.UI Parameter Settings	

**[3]** Press key **2** to switch to the second page of the menu.

**Setup Device Parameters**

13. Call Service
Initialize (ERASE)
<b>Save</b>
Export To SD
Import From SD
Exit

**[4]** To save the settings, select **Save** on the second page of the menu.



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[5] To exit the menu select **Exit**.

### 17.7.1 Setting the Capacity of the Reject Stacker

Change the number of banknotes for the reject stacker.

The following settings are possible: 10, 20, 30 40 50,60,70 80 90 100

Default value: 100 banknotes

Starting Maintenance Mode

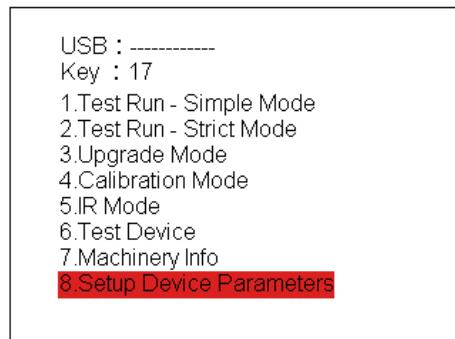
[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*



#### Important!

Do not change the default settings if possible.



[2] Select **Setup Device Parameter**.

<b>Setup Device Parameters</b>	
1.Pocket Up Max	200
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
12.UI Parameter Settings	

- [3] Select **Pocket Up Max** for setting the capacity of the reject stacker.
- [4] Press **Enter** key until the desired number of banknotes from 10 to 100 appears.
- [5] Select **Save** on the second page of the menu.  
 ⇒ The setting is saved.

### 17.7.2 Setting the Capacity of the Delivery Stacker

Change the number of banknotes for the delivery stacker.  
 The following settings are possible: 50, 100, 150, 200, 250, 300, 350, 400  
 Default value: 250 banknotes

#### Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*



#### Important!

Do not change the default settings if possible.

USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
5.IR Mode
6.Test Device
7.Machinery Info
8.Setup Device Parameters

- [2] Select **Setup Device Parameters**.

**Setup Device Parameters**

1.Pocket Up Max	70
2.Pocket Down Max	200
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
12.UI Parameter Settings	

- [3] Select **Pocket Down Max** for setting the capacity of the delivery stacker.
- [4] Press **Enter** key until the desired number of banknotes from 50 to 400 appears.
- [5] Select **Save** on the second page of the menu.  
 ⇒ The setting is saved.

### 17.7.3 Setting Values for Speed Levels

Change the speed for the different speed level.

The following settings are possible for each of speeds: 600, 650, 700, 800, 900, 1000, 1200, 1500.

For each processing speed, the stacker wheel can be adjusted and synchronized.

#### Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*


**Important!**

Do not change the default settings if possible.

USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
5.IR Mode
6.Test Device
7.Machinery Info
8.Setup Device Parameters

- [2] Select **Setup Device Parameter**.

**Setup Device Parameters**

- 1.Pocket Up Max 70
- 2.Pocket Down Max 250
- 3.Speed Mode**
- 4.Detection Level
- 5.CountMode - Light intensity 0
- 6.Printer Type Thermal
- 7.HprTriggerDetectionMode V1
- 8.SetupCountryOn&Off
- 9.UserPrintMode 0
- 10.Length Constraint 00 00
- 11.LCD Contrast 6
- 12.UI Parameter Settings

[3] Select **Speed Mode** and press the Enter key.

**Setup Device Parameters**

- 1.Det Mode Speed**
- 2.Count Mode Speed
- 3.Sn Mode Speed
- 4.Stacker Speed
- Initialize
- Save
- Exit

[4] Select the desired mode.

**Important!**

The mode "Stacker Speed" is only for factory settings. Do not use in field.

[5] Press Enter key.

**Setup Device Parameters**

- 1.Low Mode** 600
- 2.Normal Mode 900
- 3.High Mode 1050
- Exit

[6] Select the speed level.

[7] Press Enter key until the desired speed value appears.

[8] Select **Exit**.

⇒ The value is saved.

#### 17.7.4 Disabling and Enabling Denominations or Orientations

Disable or enable orientations for the banknote processing without changing the adaptation.

Two modes are available:

- **Simple Mode - Set Lv**

Disable or enable denominations without choice of orientation.

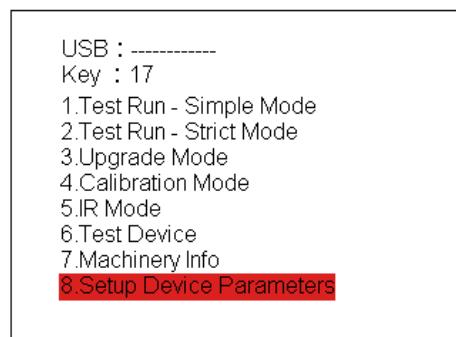
- **Professional Mode - Set Lv**

Disable or enable single orientations for every denomination of the adaption.

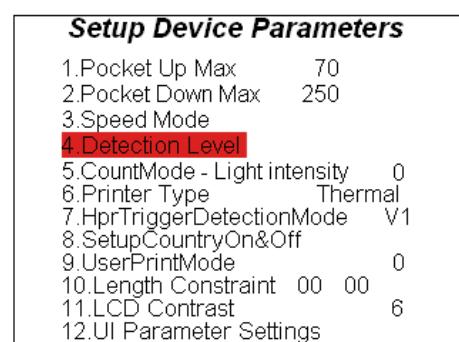
Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*

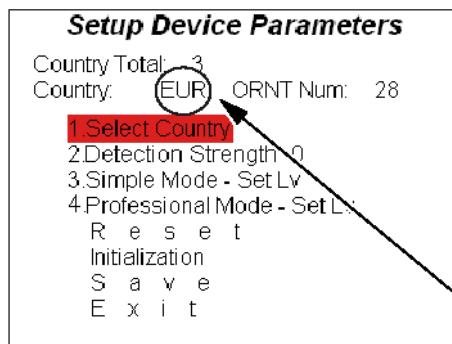


[2] Select **Setup Device Parameter** and press the Enter key.



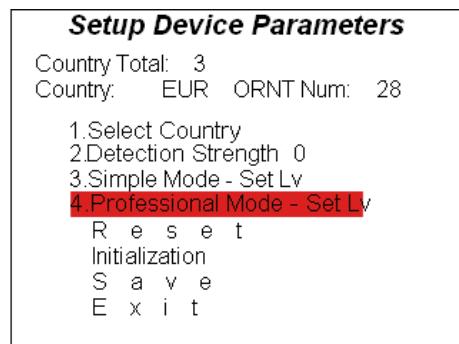
[3] Select **Detection Level** and press the Enter key.

## Select Currency

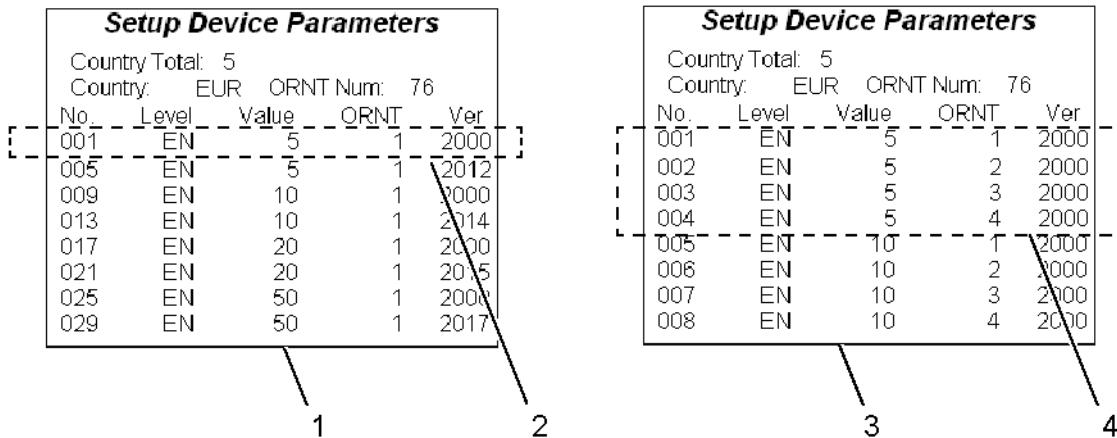


- [4] Press the Enter key until the desired currency is displayed.

## Select Mode



- [5] Select  
**Simple Mode - Set Lv**  
 or  
**Professional Mode - Set Lv**  
 and press the Enter key.  
 ⇒ A new window opens.  
 There may be follow-up pages.



**Setup Device Parameters**

Country Total: 5 Country: EUR ORNT Num: 76				
No.	Level	Value	ORNT	Ver
001	EN	5	1	2000
005	EN	5	1	2012
009	EN	10	1	2000
013	EN	10	1	2014
017	EN	20	1	2000
021	EN	20	1	2015
025	EN	50	1	2000
029	EN	50	1	2017

**Setup Device Parameters**

Country Total: 5 Country: EUR ORNT Num: 76				
No.	Level	Value	ORNT	Ver
001	EN	5	1	2000
002	EN	5	2	2000
003	EN	5	3	2000
004	EN	5	4	2000
005	EN	10	1	2000
006	EN	10	2	2000
007	EN	10	3	2000
008	EN	10	4	2000

Figure 64: Disable or enable denominations and orientations

- 1 Simple Mode
- 2 One denomination with all orientations
- 3 Professional Mode
- 4 Four orientations for one denomination

The following steps describe how to disable or enable one orientation. The procedure is the same for disabling or enabling one denomination.

- [6] Switch between the pages with the **2** and **8** position keys until the required denomination appears.
- [7] Press the Enter key to activate the selected window.  
⇒ One line is marked in red.
- [8] Scroll between the lines with the **2** and **8** position keys.

#### Change Orientation

**Setup Device Parameters**

Country Total: 5 Country: EUR ORNT Num: 76				
No.	Level	Value	ORNT	Ver
001	DIS	5	1	2000
002	EN	5	2	2000
003	EN	5	3	2000
004	EN	5	4	2000
005	EN	10	1	2000
006	EN	10	2	2000
007	EN	10	3	2000
008	EN	10	4	2000

- [9] Press the Enter key to select one orientation.  
⇒ The level value (EN or DIS) is marked in blue and can be changed.  
EN = Enable orientation  
DIS = Disable orientation

<b>Setup Device Parameters</b>				
No.	Level	Value	ORNT	Ver
001	DIS	5	1	2000
002	EN	5	2	2000
003	EN	5	3	2000
004	EN	5	4	2000
005	EN	10	1	2000
006	EN	10	2	2000
007	EN	10	3	2000
008	EN	10	4	2000

[10] Change the level value with the **2** and **8** position keys.

<b>Setup Device Parameters</b>				
No.	Level	Value	ORNT	Ver
001	DIS	5	1	2000
002	EN	5	2	2000
003	EN	5	3	2000
004	EN	5	4	2000
005	EN	10	1	2000
006	EN	10	2	2000
007	EN	10	3	2000
008	EN	10	4	2000

[11] Press the Enter key.

⇒ The changed line is marked in red.

The level is changed.

[12] Repeat → [8] to → [11] to change the level value for other orientations.

[13] Press the **C** key to deselect the red mark.

[14] Go to → [6] and repeat the procedure to change the choice of orientations.

Leave Menu

[15] Press the **C** key to leave the menu or change other orientations.

Save Changes

[16] Select **Save** and press the Enter key.

### 17.7.5 Setting the Threshold Value for Count Mode

Change the threshold values of the sensor for the "Count Mode".

For counting without checking of authenticity, the object that the sensor recognizes first is the reference. If the thickness and size is

out of  $\pm 10\%$  of the recognized value, the object is rejected. The deviation is increased/decreased with the threshold value.

The following settings are possible: Values from -10 (low) to +10 (high).

The default value is "0", that means the deviation is  $\pm 10\%$ .

### Starting Maintenance Mode

- [1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*



#### Important!

Do not change the default settings if possible.

```

USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
5.IR Mode
6.Test Device
7.Machinery Info
8.Setup Device Parameters
  
```

- [2] Select **Setup Device Parameter**.

<b>Setup Device Parameters</b>	
1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode-Lighthintensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
12.UI Parameter Settings	

- [3] Select **CountMode - Light intensity**.

- [4] Press the Enter key until the desired value appears.

- [5] Select **Save** on the second page of the menu to save the value.

### 17.7.6 Setting Printer Type

Change the printer type between thermal printer and dot-matrix printer.

---

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Default value is "Thermal".

## Starting Maintenance Mode

- [1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*



### Important!

Do not change the default settings if possible.

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
 8.**Setup Device Parameters**

- [2] Select **Setup Device Parameter**.

#### **Setup Device Parameters**

1.Pocket Up Max 70  
 2.Pocket Down Max 250  
 3.Speed Mode  
 4.Detection Level  
 5.CountMode - Light intensity 0  
 6.**Printer Type** Thermal  
 7.HprTriggerDetectionMode V1  
 8.SetupCountryOn&Off  
 9.UserPrintMode 0  
 10.Length Constraint 00 00  
 11.LCD Contrast 6  
 12.UI Parameter Settings

- [3] Select **Printer Type**.

- [4] Press the Enter key to select printer (Thermal, Dot-matrix, TV mode).

- [5] Select **Save** on the second page of the menu.

⇒ The setting is saved.

### 17.7.7 Setting HprTriggerDetectionMode

Feature is not applicable.

### 17.7.8 Setting Country On&Off

For each user, you can delimit the selectable currencies.

Default value is "All En", all currencies are enabled for all users.

### Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*



#### Important!

Do not change the default settings if possible.

17

```

USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
5.IR Mode
6.Test Device
7.Machinery Info
8.Setup Device Parameters

```

[2] Select **Setup Device Parameter**.

<b>Setup Device Parameters</b>	
1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
<b>8.SetupCountryOn&amp;Off</b>	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
12.UI Parameter Settings	

[3] Select **SetupCountryOn&Off**.

<b>Setup Device Parameters</b>	
Country Total: 1+1	
<b>USER 1</b>	
USER 2	
All En	
Initialize	
Save	
Exit	

[4] Press the Enter key to select user.

**Setup Device Parameters**

Country Total: 1+1

HUF	CNT
CHF	LKR AUTO
EUR	PLN
GBP	RUB
HRK	USD

- [5] Press the Enter key to activate or deactivate the currency.  
     ⇒ The active currency is shown in black, the deactivated currency is shown in gray.
- [6] To confirm the selection, press the **C** key.
- [7] Select **Save**.  
     ⇒ The setting is saved.

**17.7.9 Setting User Print Mode**

Switch the port COM1 or COM2 between users.

Default value is "0".

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
     → *Chapter 17 “Maintenance Mode”, p. 151*

**Important!**

Do not change the default settings if possible.

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
 8.Setup Device Parameters

- [2] Select **Setup Device Parameter**.

<b>Setup Device Parameters</b>	
1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
<b>9.UserPrintMode</b>	<b>0</b>
10.Length Constraint	00 00
11.LCD Contrast	6
12.UI Parameter Settings	

[3] Select **UserPrintMode**.

[4] Press the Enter key to select value.

- **0**

Port COM1 is used for user 1

Port COM2 is used for user 2

See also setting "Dual Printer" → *User Manual, chapter "I/O Settings"*.

- **1**

Port COM2 is disabled

Port COM1 is used for both users

See also setting "Single Printer" or "Printer + Barcode Reader" → *User Manual, chapter "I/O Settings"*.

- **2**

Port COM1 is disabled

Port COM2 is used for both users

See also setting "Single Printer" or "Printer + Barcode Reader" → *User Manual, chapter "I/O Settings"*.

- **3**

Port COM1 is used for both users

Port COM2 is used for both users

See also setting "Single Printer" or "Printer + Barcode Reader" → *User Manual, chapter "I/O Settings"*.

[5] Select **Save** on the second page of the menu.

⇒ The setting is saved.

### 17.7.10 Setting Length Constraint

Change the detection area boundaries for barcodes in TITO mode.  
 Default value is "00" for width or height.

## Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
 → “*Start Maintenance Mode*”, p. 151

**Important!**

Do not change the default settings if possible.

17

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
**8.Setup Device Parameters**

- [2] Select **Setup Device Parameter**.

**Setup Device Parameters**

1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
<b>10.Length Constraint</b>	<b>00 00</b>
11.LCD Contrast	6
12.UI Parameter Settings	

- [3] Select **Length Constraint**.

**Setup Device Parameters**

1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
<b>10.Length Constraint</b>	<b>00 00</b>
11.LCD Contrast	6
12.UI Parameter Settings	

- [4] Press the Enter key to skip the value.  
 [5] Press numerical key **2** to increase selected value from 1 to 54.

- [6] Press numerical key **8** to decrease selected value from 1 to 54.
- [7] Press the Enter key.
- [8] Select **Save** on the second page of the menu.  
⇒ The values are saved.

### 17.7.11 Setting LCD Contrast

17

Change the brightness of the LCD operating display.  
Default value is "5".

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
→ *Chapter 17 "Maintenance Mode", p. 151*



#### Important!

Do not change the default settings if possible.

```

USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
5.IR Mode
6.Test Device
7.Machinery Info
8.Setup Device Parameters
  
```

- [2] Select **Setup Device Parameter**.

<b>Setup Device Parameters</b>	
1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
12.UI Parameter Settings	

- [3] Select **LCD Contrast**.

- [4] Press the **Enter** key to decrease or increase the value from 1 to 10.

- [5] Select **Save** on the second page of the menu.  
 ⇒ The setting is saved.

## 17.7.12 Setting Call Service

With the call service function, you can be informed on the necessity of service or inspection.

17

### 17.7.12.1 Activate the Call Service Function

Follow the steps below to activate the **Call Service** function.

The function can be activated for a defined time period or/and for a defined number of processed banknotes.

Starting the Maintenance Mode

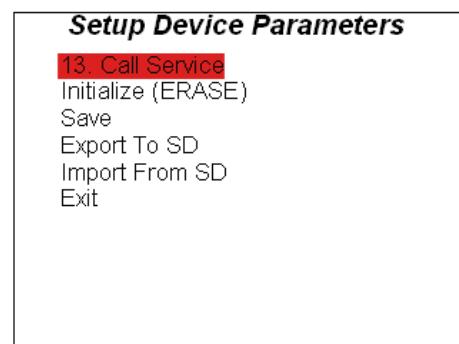
- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
 8.Setup Device Parameters

- [2] Select **Setup Device Parameter**.

⇒ For the settings, a two-page menu is available.

Selecting Call Service Menu



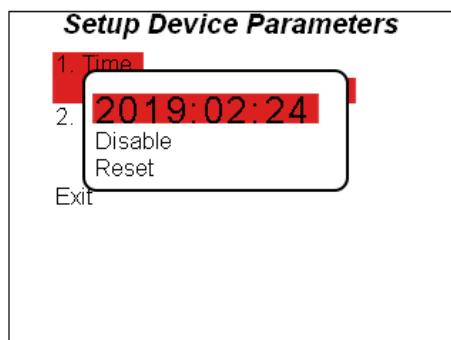
- [3] Select **13. Call Service** on the second page of the menu.

## Activating Time Period



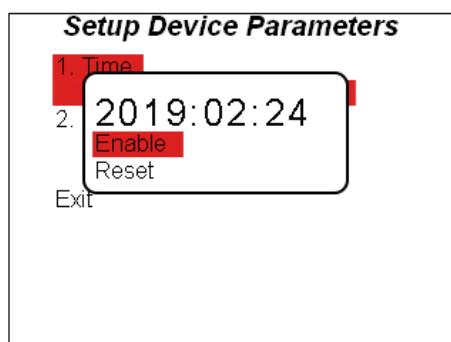
17

**[4] Select 1.Time.**



**[5]** Enter the date on which the call service icon should be displayed.

**[6]** Press the Enter key.



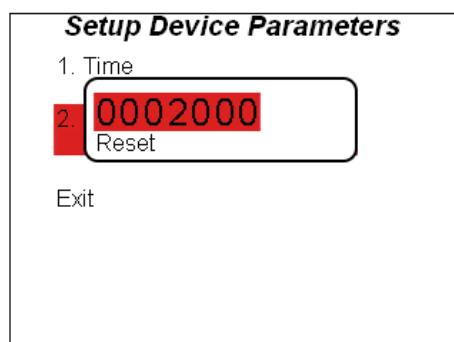
**[7]** Select **Enable** to activate the setting.

**[8]** Press **C** key to leave the menu.

## Activating Special Service Counter



[9] Select 2. Special service counter.



[10] Enter the number of banknotes that should be processed until the call service icon should be displayed.  
The input is only possible in units of thousand.  
Use the C key to change wrong inputs.

[11] Press the Enter key to confirm the setting.

[12] Press C key to leave the menu.



[13] Select Exit to leave the menu.

⇒ The settings are active.

No saving in a higher level of the menu is required.

## Restarting the Device

- [14] Restart the device by switching Off/On.  
 ⇒ The **Call Service** function is active.

### 17.7.12.2 Deactivate (Reset) the Call Service Function

Follow the steps below to deactivate or reset the **Call Service** function.

## Starting the Maintenance Mode



### Important!

The PIN 8302 needed for the deactivation of the settings is not changeable and cannot be disabled.

- [1] Start the Maintenance Mode.  
 → *Chapter 17 "Maintenance Mode", p. 151*
  - [2] Select **Setup Device Parameter**.  
 ⇒ For the settings, a two-page menu is available.
- Selecting Call Service Menu
- [3] Select **13. Call Service** on the second page.  
 ⇒ For reached limits, a green checkmark is displayed.

## Deactivating Time Period

- [4] Select **1.Time**.
- [5] Select **Disable**.
- [6] Select **Reset**.
- [7] Enter the PIN 8302.  
 ⇒ OK will be displayed for correct pin.
- [8] Press **C** key to exit.

## Deactivating Special Service Counter

- [9] Select **2. Special service counter**.
- [10] Select **Reset**.
- [11] Enter the PIN 8302.  
 OK will be displayed for correct pin.
- [12] Press **C** key to exit.
- [13] Select **Exit** to leave the menu.

⇒ The setting is deactivated.

No saving in a higher level of the menu is required.

## Restarting the Device

[14] Restart the device by switching Off/On.

⇒ The **Call Service** function is deactivated.

17

### 17.7.13 Setting Default Values

To reset the changed values to the default setting, proceed as follows.



#### Important!

Observe the following effect:

- The calibration data of all sensors is deleted.
- The settings for fitness sorting are deleted.

## Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*



#### Important!

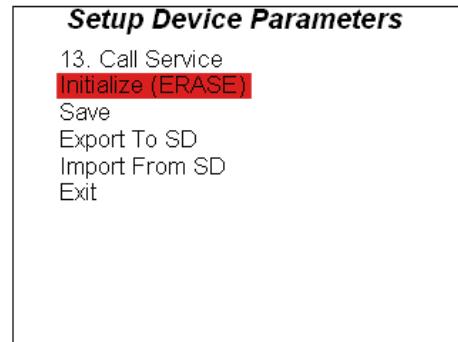
Do not change the default settings if possible.

```

USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
5.IR Mode
6.Test Device
7.Machinery Info
8.Setup Device Parameters

```

[2] Select **Setup Device Parameter**.



[3] Select **Initialize (ERASE)**.

⇒ The message **Yes (Start)/No (C)** appears.

[4] Do the following:

- To start the initialization press Enter key (Start).
- Press C key (Cancel) to cancel the start.



#### Important!

With the following step, all settings are overwritten with default values.

[5] Select **Save**.

⇒ The default values now apply and all user-specific settings are overwritten.

For details to reset the criteria for fitness sorting, see → *User Manual, chapter "Setting FIT Mode"*.

#### 17.7.14 Export or Import Machine Settings

You can export the settings of a machine to an SD card. Afterwards you can import these settings from the SD card to other BPS C1 machines.

Requirement

- SD card is inserted in the appropriate slot on the rear of the machine.

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 "Maintenance Mode", p. 151*

**Important!**

Do not change the default settings if possible.

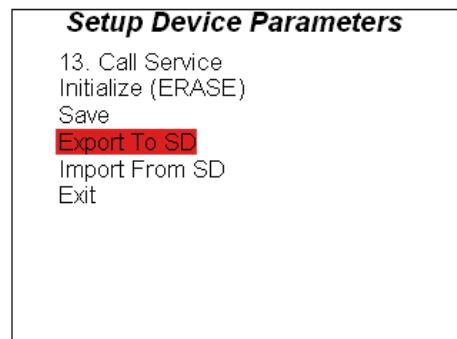
USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
**8.Setup Device Parameters**

**[2]** Select **Setup Device Parameter** and press the Enter key.

⇒ A two-page menu is available.

**[3]** Press key **2** to switch to the second page of the menu.

## Exporting Machine Settings



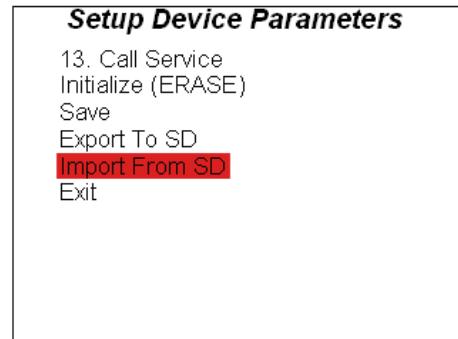
**[4]** Select **Export To SD**.

⇒ The settings of the machine are stored on the SD card.

**[5]** Remove the SD card.

## Importing Machine Settings

**[6]** Insert the SD card to the machine which should be changed.



[7] Select Import From SD.

⇒ The machine settings are imported.

### 17.7.15 Setting UI Parameters

You can change several settings in the submenus of the **UI Parameter Settings** menu.

For more clearness, the values for the settings within the submenus are described in tables.

- UI settings
- Hardware settings
- Machinery action settings
- Report settings
- XML report settings
- FSN report settings (applicable for chinese HW only)

#### Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ *Chapter 17 “Maintenance Mode”, p. 151*

**Important!**

Do not change the default settings if possible.

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
**8.Setup Device Parameters**

**[2] Select Setup Device Parameter.**

**Setup Device Parameters**

1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
<b>12 UI Parameter Settings</b>	

**[3] Select UI Parameter Settings and press the Enter key.**

⇒ For the settings, the following menu is available.

**Setup Device Parameters**

<b>1.UI Interface</b>
2.Hardware
3.Machinery Action
4.Report
5.XML
6.FSN
Initialize (ERASE)
Save
Exit

**[4] To save the setting, select Save.****[5] To exit the menu select Exit.****17.7.15.1 Setup User Interface**

Several user interface settings are concentrated within the submenus of the **UI Interface** menu.

---

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## Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ Chapter 17 "Maintenance Mode", p. 151



### Important!

Do not change the default settings if possible.

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
**8.Setup Device Parameters**

[2] Select **Setup Device Parameter**.

**Setup Device Parameters**

1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
<b>12.UI Parameter Settings</b>	

[3] Select **UI Parameter Settings**.

**Setup Device Parameters**

<b>1.UI Interface</b>
2.Hardware
3.Machinery Action
4.Report
5.XML
6.FSN
Initialize (ERASE)
Save
Exit

[4] Select **UI Interface**.

⇒ The following two-page menu is available.

**Setup Device Parameters**

1.User2	Default
2.User2-Batch	Disable
3.Serial Mode	Default
4.TITO Mode	Default
5.Amount List Form	Default
6.TAPE Mode	Disable
7.Main Password	Disable
8.Show Date Tye	Default
9.Err CG Delay Display	0 s
10.User2-Detection	Enable
11.SD-Upgrade	Default
12.Fitness Function	Default

**Setup Device Parameters**

13.MIX Function	Default
14.SORT Function	Default
15.FACE Function	Default
16.ORNT Function	Default
17.EMI Function	Default
18.Auto Country Mode	Mix
19.Cheque Mode	Default

- [5] Use keys **2** and **8** on the numerical keypad to select the desired option.
- [6] Use the Enter key to switch the setting of the selected option.
- [7] Press the **C** key to exit the menu.
- [8] See the following table for more information.

Entry	Options	Definition	Default
1.User2	Default	= Enable	
	Enable	Two users can operate the device	X
	Disable	Only user 1 available; Enter key and <b>C</b> key for user 1 only	
2.User2-Batch	Enable	Individual batch value for user 1 and user 2	
	Disable	Same batch value for user 1 and user 2	X
3.Serial Mode	Default	Functions SN and SN compare enabled	X
	Disable	Functions SN and SN compare disabled	
	SN OFF	SN disabled, SN compare enabled	
	SN COM OFF	SN enabled, SN compare disabled	

Entry	Options	Definition	Default
<b>4.TITO Mode</b>	Default	= Tito Mix	
	Disable	Ticket reading (TITO Mode) disabled	
	Tito Mix	Ticket and banknote recognition enabled	X
	TITO	Only ticket recognition -> banknotes are sent to reject	
	I25	Barcode type	
	EAN13	Barcode type	
	128C	Barcode type	
<b>5.Amount List Form</b>	Default	= Small->Large	
	Small->Large	Order of denomination in the result list is increasing	X
	Large->Small	Order of denomination in the result list is decreasing	
	Mode A	Change order of columns in the result list: Denomination-count-amount into Count-denomination-amount	
<b>6.TAPE Mode</b> (applicable for CNY currency only)	Disable		X
	Value 1–10	Changing value leads to loss of ECB certification! Changing value overwrites the fitness settings! Recommended value = 6	
<b>7.Main Password</b>	Enable	Request of password after switching device on	
	Disable	No request of password	X
<b>8.Show Date Type</b>	Default	= yyymmdd	
	yyymmdd	Format of date in the result list: Year (4-digits) / month (2-digits) / day (2-digits)	X
	yyym(w)dd	Format of date in the result list: Year (4-digits) / month (abbreviation) / day (2-digits)	
	ddmm(w)yy	Format of date in the result list: Day (2-digits) / month (abbreviation) / year (4-digits)	
	mmddyy	Format of date in the result list: Month (2-digits) / day (2-digits) / year (4-digits)	
<b>9.Err CG Delay Display</b>	Disable	Error message "Stacker full" has to be confirmed by pressing key <b>C</b> .	X

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Entry	Options	Definition	Default
	Value 0–6	Error message "Stacker full" is shown from 0 to 6 seconds.	
<b>10.User2-Detection</b>	Enable	Detection On/Off can be set for user 1 and user 2 individually	
	Disable	Detection On/Off is set for both user 1 and user 2	
<b>11.SD-Upgrade</b>	Default	= Enable	
	Enable	Use of SD card enabled	X
	Disable	Use of SD card disabled	
<b>12.Fitness Function</b>	Default	All fitness modes are available for the <b>F2</b> key	X
	ATM/OFF	Set options for the <b>F2</b> key: Only ATM mode and disable fitness mode available	
	FIT/OFF	Set options for the <b>F2</b> key: Only FIT mode and disable fitness mode available	
<b>13.MIX Function</b>	Default	=Enable	
	Enable	Set options for the <b>F1</b> key: Sorting mode MIX is available	X
	Disable	Set options for the <b>F1</b> key: Sorting mode MIX not available	
<b>14.SORT Function</b>	Default	= Enable	
	Enable	Set options for the <b>F1</b> key: Sorting mode SORT is available	X
	Disable	Set options for the <b>F1</b> key: Sorting mode SORT not available	
<b>15.FACE Function</b>	Default	= Enable	
	Enable	Set options for the <b>F1</b> key: Sorting mode FACE is available	X
	Disable	Set options for the <b>F1</b> key: Sorting mode FACE not available	
<b>16.ORNT Function</b>	Default	= Enable	
	Enable	Set options for the <b>F1</b> key: Sorting mode ORNT is available	X
	Disable	Set options for the <b>F1</b> key:	

Entry	Options	Definition	Default
		Sorting mode ORNT not available	
<b>17.EMI Function</b>	Default	= Enable	
	Enable	Set options for the <b>F1</b> key: Sorting mode EMISN is available	X
	Disable	Set options for the <b>F1</b> key: Sorting mode EMISN not available	
<b>18.Auto Country Mode</b> (set the action for operating with currencies)	Default	= Option Auto only	
	Disable	Option Auto and Mix not available	
	Auto	Default	
	Mix	Option Mix only	
	Auto+Mix	Option Auto and Mix	
<b>19.Cheque Mode</b>	Default	= E13B check type	
	Disable	No check	
	E13B	Default	
	CMC7	Check type	
	OCR-A	Check type	
	OCR-B	Check type	

### 17.7.15.2 Setup Hardware

You can change the following settings:

- Usage of COM port
- Appearance of sensor messages
- Way of cutting printer output
- Baud rate for barcode reader
- Start/Stop option for fan

#### Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
*→ Chapter 17 “Maintenance Mode”, p. 151*

**Important!**

Do not change the default settings if possible.

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
**8.Setup Device Parameters**

**[2] Select Setup Device Parameter.**

**Setup Device Parameters**

1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
<b>12 UI Parameter Settings</b>	

**[3] Select UI Parameter Settings.**

**Setup Device Parameters**

1.UI Interface
<b>2.Hardware</b>
3.Machinery Action
4.Report
5.XML
6.FSN
Initialize (ERASE)
Save
Exit

**[4] Select Hardware.**

<b>Setup Device Parameters</b>	
1.ComPort	Default
2.Stacker Sensor	Default
3.Reject Sensor	Default
4.Print Cut	Default
5.Barcode Reader Baud	9600
6.Fan Mode	Default

- [5] Use keys **2** and **8** on the numerical keypad to select the desired option.
- [6] Use the Enter key to switch the setting of the selected option.
- [7] Press the **C** key to exit the menu.
- [8] See the following table for more information.

Entry	Options	Definition	Default
1.ComPort	Default	Port for printer usage	X
	Mode A	Transfer of data via COM port to GD Viewer if the PC has no USB port	
2.Stacker Sensor	Default	Sensor for stacker full On Processing of banknotes is interrupted and error message appears	X
	Disable	Sensor for stacker full Off Processing of banknotes is continued and no error message appears	
3.Reject Sensor	Default	Sensor for stacker full On Processing of banknotes is interrupted and an error message appears	X
	Disable	Sensor for stacker full Off Processing of banknotes is continued and no error message appears	
4.Print Cut	Full Cut	Cut of printer paper after each receipt	X
	Partial Cut	Partial cut of printer paper after each receipt	
	Disable	No cut of printer paper	
5.Barcode Reader Baud	9600	Set barcode reader baud rate to 9600	X

Entry	Options	Definition	Default
	38400	Set barcode reader baud rate to 38400	
	57600	Set barcode reader baud rate to 57600	
	115200	Set barcode reader baud rate to 115200	
<b>5.Fan Mode</b>	Default	Fan starts and stops with operating process	X
	Mode A	Fan stops 5 min after end of operating process	
	Mode B	Fan runs always	

### 17.7.15.3 Setup Machinery Action

You can change the following settings:

- Reset of counters
- Mode of display
- BAT key options
- Auto print
- Threshold for counting mode
- Slow down function
- Operator for cash management system

Starting Maintenance Mode

- [1] Start the Maintenance Mode.  
*→ Chapter 17 “Maintenance Mode”, p. 151*



#### Important!

Do not change the default settings if possible.

USB : -----  
Key : 17  
1.Test Run - Simple Mode  
2.Test Run - Strict Mode  
3.Upgrade Mode  
4.Calibration Mode  
5.IR Mode  
6.Test Device  
7.Machinery Info  
8.Setup Device Parameters

- [2] Select **Setup Device Parameter**.

**Setup Device Parameters**

- 1.Pocket Up Max 70
- 2.Pocket Down Max 250
- 3.Speed Mode
- 4.Detection Level
- 5.CountMode - Light intensity 0
- 6.Printer Type Thermal
- 7.HprTriggerDetectionMode V1
- 8.SetupCountryOn&Off
- 9.UserPrintMode 0
- 10.Length Constraint 00 00
- 11.LCD Contrast 6
- 12.UI Parameter Settings**

**[3] Select UI Parameter Settings.**
**Setup Device Parameters**

- 1.UI Interface
- 2.Hardware
- 3.Machinery Action**
- 4.Report
- 5.XML
- 6.FSN
- Initialize (ERASE)
- Save
- Exit

**[4] Select Machinery Action.**
**Setup Device Parameters**

- |                      |             |
|----------------------|-------------|
| 1.Reject Mode        | Default     |
| 2.Sort Mode          | Default     |
| 3.Remote Display     | Default     |
| 4.GT Auto Save       | Default     |
| 5.GT Save Condition  | Default     |
| 6.Batch Mode         | Normal Mode |
| 7.Auto Print         | Default     |
| 8.Count Value        | Disable     |
| 9.Brake Mode         | Enable      |
| 10.Clear Amount Mode | Mode A      |
| 11.CMS Mode          | Default     |
| 12.CMS Online Mode   | O1:on,O2:on |

**Setup Device Parameters**

- |                     |         |
|---------------------|---------|
| 13.Machine Use Type | Default |
| 14.Batch Logic      | Default |
| 15.GD Action Mode   | Mode A  |
| 16.Print Page Code  | Default |

**[5]** Use keys **2** and **8** on the numerical keypad to select the desired option.

**[6]** Use the Enter key to switch the setting of the selected option.

[7] Press the **C** key to exit the menu.

[8] See the following table for more information.

Entry	Options	Definition	Default
<b>1.Reject Mode</b>	Default	Reset reject counter after removal of banknotes from reject stacker.	X
	Mode A	Banknotes can be removed from reject stacker. Reset of reject counter after removal of all banknotes from reject and delivery stacker.	
<b>2.Sort Mode</b>	Default	For sorting mode DENO only No reset of counter once batch value is reached.	X
	Mode A	For sorting mode DENO only Reset of counter once batch value is reached.	
<b>3.Remote Display</b>	Default	= Normal Mode	
	Normal Mode	Synchronization of external display with the device screen.	X
	Grand Total	Synchronization of external display with the device screen and display of Grand Total list.	
	FIT Form	Not used	
<b>4.GT Auto Save</b>		Not applicable	
<b>5.GT Save Condition</b>		Not applicable	
<b>6.Batch Mode</b>	Normal Mode	For processing with BAT key only. No reset of counter once batch value is reached.	X
	Mode A	For processing with BAT key only. Reset of counter once batch value is reached.	
	Mode B	Reset of counter when singler and delivery stacker are empty.	
<b>7.Auto Print</b>	Default	According to user setting	X
	Disable	For device models without auto settings only; for standard devices the setting is overwritten. Auto Print is OFF	
	Enable	For device models without auto settings only; for standard devices the setting is overwritten. Auto ADD is ON	
<b>8.Count Value</b>	Disable	For counting mode, the tolerance of size and thickness is 10% of reference banknote.	X

Entry	Options	Definition	Default
	Value 0–10	Increase the tolerance in steps of 1%.	
<b>9.Brake Mode</b>	Enable	For filling the delivery stacker, the automatic slowdown of speed is switched on.	X
	Disable	Automatic slow down switched off.	
<b>10.Clear Amount Mode</b>	Mode A	Reset counter when singler and delivery stacker are empty.	X
	Mode B	Reset counter when singler, delivery, and reject stacker are empty.	
<b>11.CMS Mode</b>		Not used	
<b>12.CMS Online Mode</b>	O1:on.O2:on	Activating operator 1 and 2 for Cash Management System.	X
	O1:on.O2:off	Activating operator 1 for Cash Management System.	
	O1:off.O2:on	Activating operator 2 for Cash Management System.	
	Disable	Deactivate the Online Mode.	
<b>13.Machine Use Type</b>	Default	Save FSN without rejection note (applicable for chines HW only).	X
	Front Office	Save FSN without rejection note (applicable for chines HW only).	
	Back Office	Save FSN with all notes (applicable for chines HW only).	
<b>14.Batch Logic</b>	Default	Reset amount when the banknotes are removed from the delivery stacker.	X
	Pay Out	Batch amount mode on. No reset of amount even the banknotes are removed from the delivery stacker.	
	Normal Mode	Reset amount when the banknotes are removed from the delivery stacker.	
<b>15.GD Action Mode</b>	Mode A	When the singler is empty, the next banknote is considered as a new reference banknote.	X
	Mode B	The reference banknote is valid until both singler and delivery stacker are emptied.	
<b>16.Print Page Code</b>	Default		X
	Default (blue)	If a 3-digit character code is installed on the printer, the character code can be selected using key <b>2</b> and <b>8</b> .	

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#### 17.7.15.4 Setup Report

Change several settings for reports.

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ Chapter 17 "Maintenance Mode", p. 151



##### Important!

Do not change the default settings if possible.

USB : -----  
 Key : 17  
 1.Test Run - Simple Mode  
 2.Test Run - Strict Mode  
 3.Upgrade Mode  
 4.Calibration Mode  
 5.IR Mode  
 6.Test Device  
 7.Machinery Info  
 8.**Setup Device Parameters**

[2] Select **Setup Device Parameter**.

**Setup Device Parameters**

1.Pocket Up Max	70
2.Pocket Down Max	250
3.Speed Mode	
4.Detection Level	
5.CountMode - Light intensity	0
6.Printer Type	Thermal
7.HprTriggerDetectionMode	V1
8.SetupCountryOn&Off	
9.UserPrintMode	0
10.Length Constraint	00 00
11.LCD Contrast	6
<b>12.UI Parameter Settings</b>	

[3] Select **UI Parameter Settings**.

**Setup Device Parameters**

1.UI Interface
2.Hardware
3.Machinery Action
<b>4.Report</b>
5.XML
6.FSN
Initialize (ERASE)
Save
Exit

[4] Select **Report**.

<b>Setup Device Parameters</b>		
1.Report File Form		EUR
2.Report File Type		Default
3.Report File To SD		Default
4.Fitness Report Mode		Deposit
5.Report Save Mode		Mode C

- [5] Use keys **2** and **8** on the numerical keypad to select the desired option.
- [6] Use the Enter key to switch the setting of the selected option.
- [7] Press the **C** key to exit the menu.
- [8] See the following table for more information.



**Important!**

Greyed out options are not applicable.

Entry	Options	Definition	Default
1.Report File Form	Default	= Enable	
	Disable	Report function Off	
	Enable	Report function On, standard format	X
	EUR	Report function On, customized format (ECB)	
	Form A	Feature applicable for chinese HW only! Report function On, customized format	
2.Report File Type	Default	= .TXT	
	.TXT	File type for fitness and daily report is .txt	X
	.CSV	File type for fitness and daily report is .csv	
3.Report File To SD	Default	= Enable	
	Enable	Fitness and daily reports are saved to SD	X
	Disable	Fitness and daily report are not saved to SD Setting for daily report without SD card	

Entry	Options	Definition	Default
<b>4.Fitness Report Mode</b>	Default	Wizard function Off	X
	Wizard	Wizard for banknote processing according to ECB specifications for user 2	
	Deposit	Deposit wizard for user 2	
	Deposit NV	Deposit processing for user 2 without value prompt	
	DK Ver2	Deposit processing for user 2 with operator ID prompt	
	DK Ver2+NV	Deposit processing for user 2 with operator ID prompt, without value prompt	
	DK Storage	Not used	
<b>5.Report Save Mode</b>		Not used	

### 17.7.15.5 Setup XML

Change several settings for XML reports.

Starting Maintenance Mode

[1] Start the Maintenance Mode.

→ Chapter 17 “Maintenance Mode”, p. 151



#### Important!

Do not change the default settings if possible.

```

USB : -----
Key : 17
1.Test Run - Simple Mode
2.Test Run - Strict Mode
3.Upgrade Mode
4.Calibration Mode
5.IR Mode
6.Test Device
7.Machinery Info
8.Setup Device Parameters

```

[2] Select **Setup Device Parameter**.

**Setup Device Parameters**

- 1.Pocket Up Max 70
- 2.Pocket Down Max 250
- 3.Speed Mode
- 4.Detection Level
- 5.CountMode - Light intensity 0
- 6.Printer Type Thermal
- 7.HprTriggerDetectionMode V1
- 8.SetupCountryOn&Off
- 9.UserPrintMode 0
- 10.Length Constraint 00 00
- 11.LCD Contrast 6
- 12.UI Parameter Settings**

**[3] Select UI Parameter Settings.**
**Setup Device Parameters**

- 1.UI Interface
- 2.Hardware
- 3.Machinery Action
- 4.Report
- 5.XML**
- 6.FSN
- Initialize (ERASE)
- Save
- Exit

**[4] Select XML.**
**Setup Device Parameters**

- 1.XML Mode Default
- 2.XML File To SD Default
- 3.Deposit Report Default

**[5]** Use keys **2** and **8** on the numerical keypad to select the desired option.

**[6]** Use the Enter key to switch the setting of the selected option.

**[7]** Press the **C** key to exit the menu.

**[8]** See the following table for more information.

Entry	Options	Definition	Default
<b>1.XML Mode</b>	Default	= Enable	

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Entry	Options	Definition	Default
	Enable	Transfer of XML report On	X
	Disable	Transfer of XML report Off	
2.XML File To SD	Default	= Enable	
	Enable	XML report is saved to SD	X
	Disable	XML report is not saved to SD SD report is transferred via LAN only. If the connection is interrupted, the report is lost!	
3.Deposit Report	Default	rpt5010	
	rpt5010	Default Same as rpt5010old, but for the variable "Quality" added value "Accepted" for processing without fitness.	X
	rpt5010old	Report based on the xml-deposit report of the BPS 200/C4. Report with the same variables and values like BPS 200/C4 as far as they can be generated by the BPS C1.	
	rpt5011	Same as rpt5010 but total value of coins reconciliation as well as total sum (Sum + Coins) added.	

#### 17.7.15.6 Setup FSN

Feature applicable for chinese HW only.

## 18 GD\_PCSuite Software

The GD\_PCSuite software allows you to carry out various operations for a BPS C1 connected to your PC via a user interface.

Before using for the first time, the following steps are necessary.

Connection of the machine to the PC and if necessary, installation of driver software.

→ *Section 18.2 “BPS C1 Connecting and Installing Driver Software”, p. 242*

Make sure that the system requirements are met.

→ *Section 18.1 “System Requirements”, p. 242*

GD\_PCSuite Programs

The following programs are available in GD\_PCSuite:

- GD\_PCSuite - End User Tool
  - With the components GD\_Viewer and GD\_Reader.
- GD\_PCSuite - Distributor Tool

You receive the software via the link that is given in the quick instruction (Quick Start Guide).



### Important!

The End User Tool (GD\_Viewer/GD\_Reader) and the Distributor Tool should not run simultaneously on your PC. Close one program before starting the other.

Software Directories

The directory *Software* contains:

- *Driver*  
Driver software
  - *GD\_PCSuite\_Client\_x\_x\_xx* (GD\_PCSuite - End User Tool)
    - *GD\_BCVIEWER.exe*
    - *GD\_SNDBREADER.exe*
  - *GD\_PCSuite\_Relx.x* (GD\_PCSuite - Distributor Tool)
    - *PlatformGD\_x\_xxxxxxxxxxx.exe*
- "x" stands for the different version numbers.

Overview of End User Tool

Two program components (Viewer and Reader) can be used to evaluate the measurement results of banknote processing on your PC and process them further.

The following options are available:

- Analyze ticket reading barcodes.

## Overview of Distributor Tool

18

- Evaluate serial numbers.
- Save the results in different formats.

→ *Section 18.3 "Using the PCSuite - End User Tool", p. 255*

The Distributor Tool offers the following options:

- Update software
- Manage BPS C1 in the network.
- Edit password and IP address.
- BPS C1 Upgrade
- Output machine information
- Generate report title.
- Recording banknote data

→ *Section 18.4 "Using the PCSuite – Distributor Tool", p. 269*

## 18.1 System Requirements

The following HW requirements are needed for the installation and operation of the "PC Suite".

- Windows operating system®XP / Vista / Windows® 7 / 8 / 10
- CPU at least 800 M Hz ® Pentium III
- Memory space at least 256 MB RAM
- Working memory at least 60 MB
- A free USB 1.1 or 2.0 interface
- A free 100 Mbit Ethernet interface

## 18.2 BPS C1 Connecting and Installing Driver Software

Install the driver software manually if it is not installed automatically when the machine is connected to the PC.

For more information for:

- Windows XP / Vista / 7 / 8
  - *"Manually Installing Driver Software for Windows XP / Vista / 7 / 8", p. 244*
- Windows 10
  - *"Manually Installing Driver Software for Windows 10", p. 251*

You can connect the machine via USB or LAN. The description describes only connection via USB.

## Requirement

- Product software has been successfully installed.
- USB cable (in the scope of delivery) or LAN cable (not in scope of delivery)



### Important!

Do not use a USB interface of 3.0 or higher on your computer.

Only connect the machine to the system after the product software has been installed.

The driver software is only installed when the BPS C1 is connected to the PC for the first time.

Windows XP / Vista / 7 / 8 / 10

- [1] Insert the USB cable into the USB interface on the back of the machine.
- [2] Plug the other end of the cable into the USB interface of the PC.
- [3] Switch on the machine.  
 ⇒ The operating system detects the machine and completes the installation of the driver software or the "Found New Hardware" message appears.



- [4] Click **Next**.

⇒ The software is installed.



Figure 65: Installing Driver Software



**[5] Click **Finish**.**

If the driver software is not installed automatically, proceed as follows.

Manually Installing Driver Software for Windows XP / Vista / 7 / 8



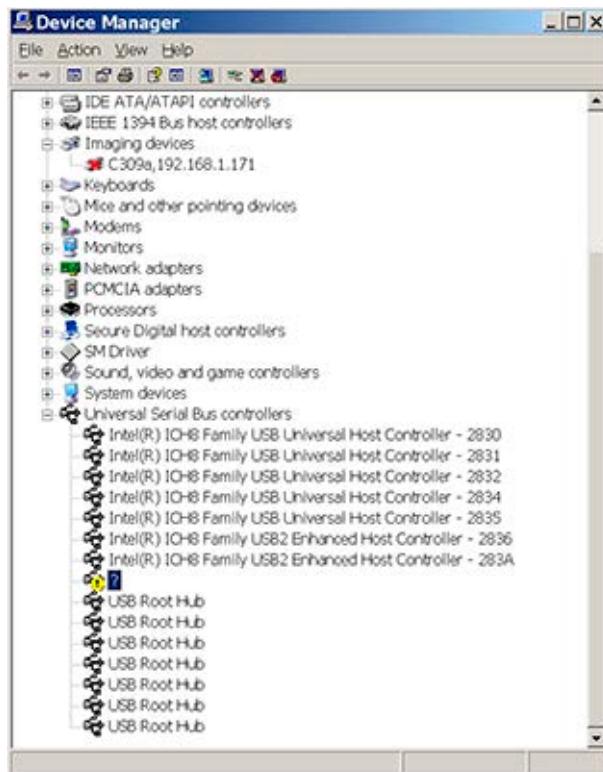
**[1] Right-click on the **My Computer** icon on your desktop.**



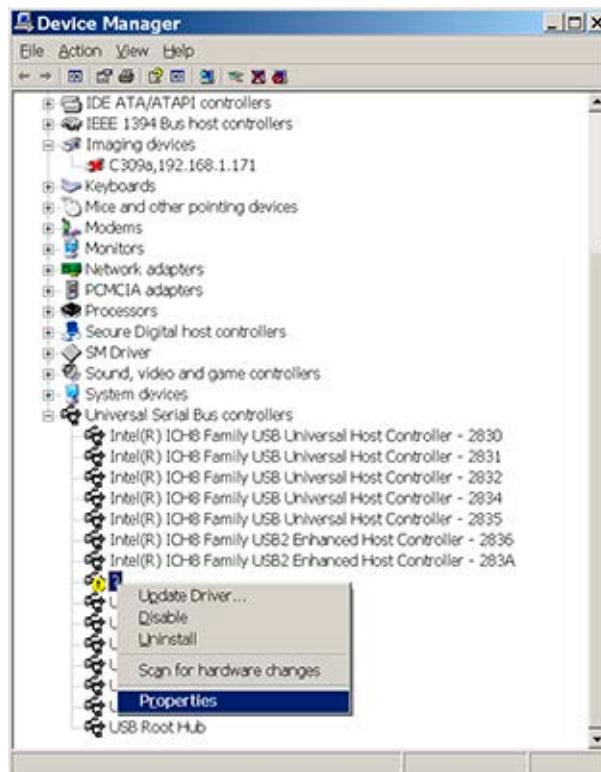
- [2] Select **Properties** from the drop-down menu.  
[3] Select the **Hardware** tab.



- [4] Click **Device Manager**.



[5] Open the *Universal Serial Bus controllers* directory.



- [6] Right-click on ?.
- [7] Select **Properties** from the drop-down menu.



- [8] Select the **Driver** tab.

**[9] Select Update Driver.**



**[10] Select the first option Yes, this time only.**

**[11] Click Next.**



**[12] Select the second option Install from a list or specific location [Advanced].**

**[13] Click Next.**



- [14] Click **Browse**.
- [15] Navigate to the *C:\Programms\GD Technology\PCSuite Client\driver* directory.
- [16] Click **Next**.



- [17] The device manager searches for the driver software.



[18] Click **Continue Anyway**.

⇒ The driver software is installed.



Figure 66: Installing Driver Software



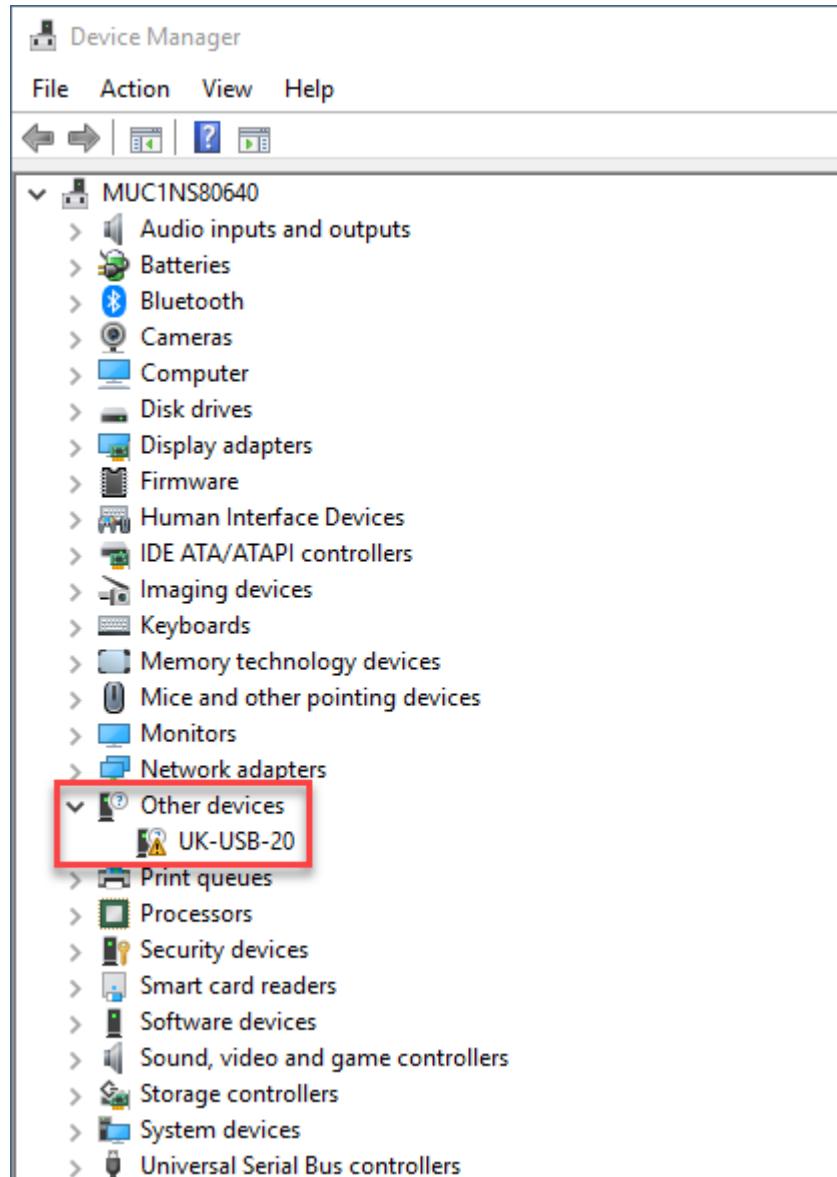
18

**[19]** Click **Finish**.

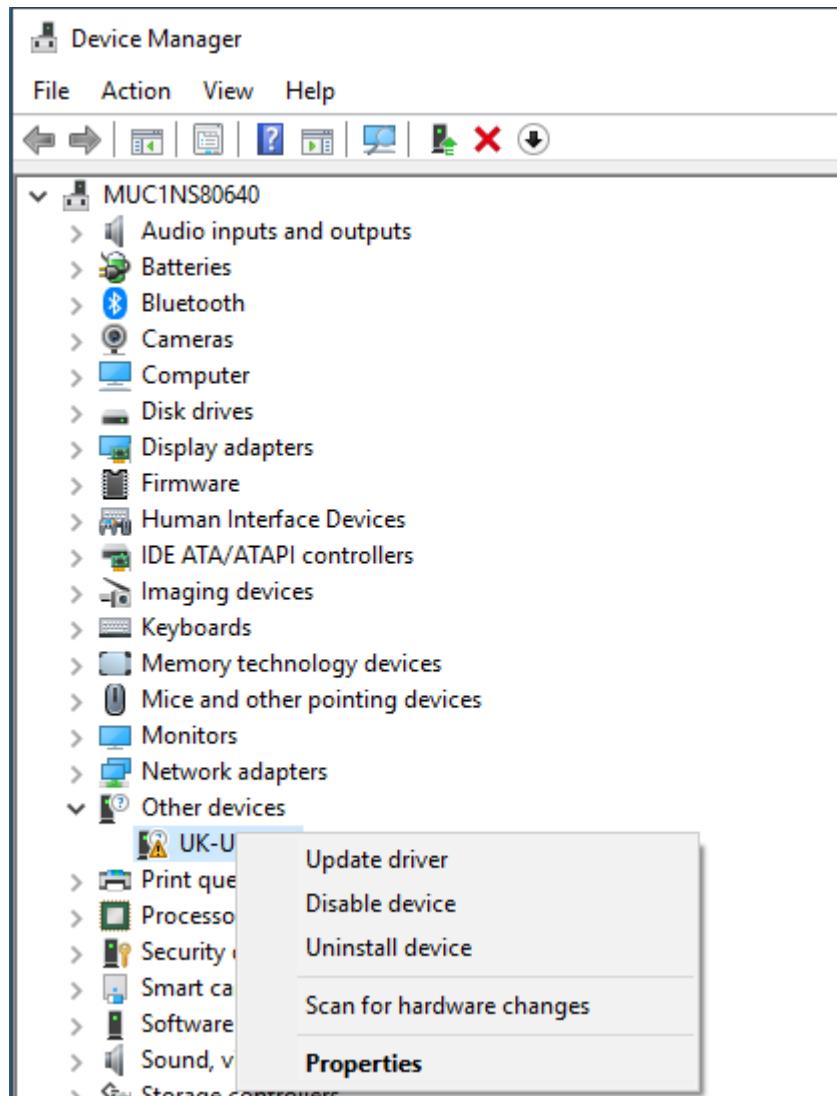
⇒ Installation of the driver software for BPS C1 is now complete.

#### Manually Installing Driver Software for Windows 10

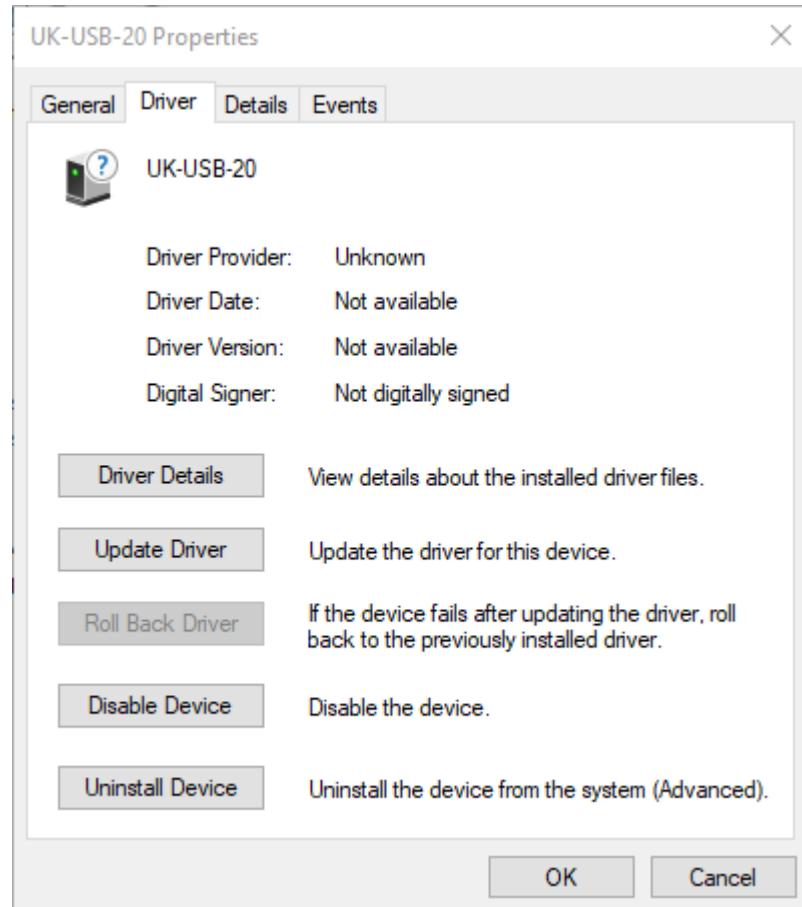
**[1]** Open the device manager.



[2] Search for the device with the driver problem.

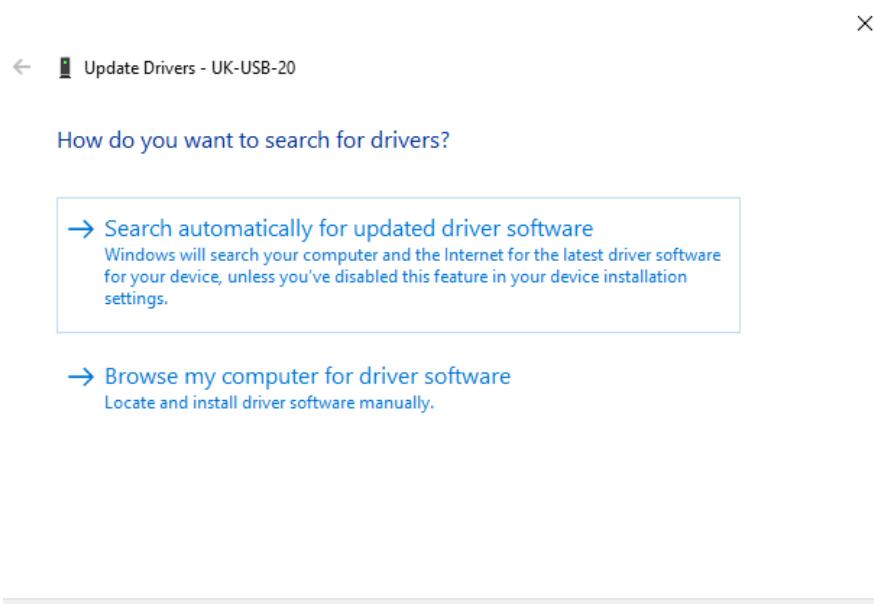


- [3] Right-click on this device and select **Properties** from the drop-down menu.



[4] Select the **Driver** tab.

[5] Select **Update Driver**.



- [6] Select the second option **Browse my computer for driver software**.
- [7] Navigate to the folder **DRIVER**.
- [8] Select **Install**.
  - ⇒ The driver software is installed.

### 18.3 Using the PCSuite - End User Tool

The following program components are provided for using the "PC Suite - End User Tool".

- GD Viewer
  - Analyze, save and print the results of banknote processing
- GD Reader
  - Sort and store saved results



#### Important!

The End User Tool and the Distributor Tool should not run simultaneously on your PC. Close one program before starting the other.

### 18.3.1 Using Viewer

GD Viewer is used with the following main menu.

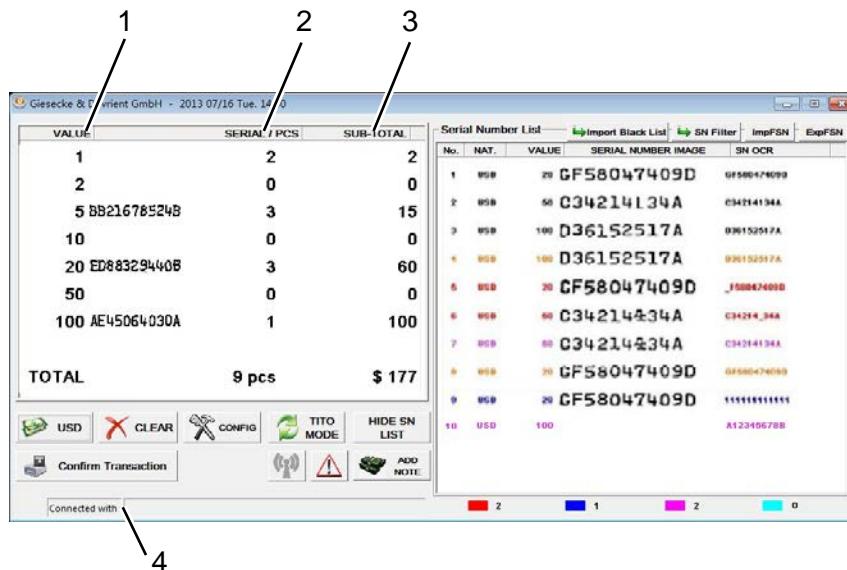


Figure 67: GD Viewer Main Menu

- 1 Denominations of the selected currency
- 2 Number and serial numbers (only with serial number reading)
- 3 Value of the processed banknotes
- 4 Information about connection

#### 18.3.1.1 Starting Viewer

- [1] Start the Viewer by double-clicking on the program name *GD\_BCVIEWER.exe*.  
 ⇒ The main menu appears.

#### 18.3.1.2 Selecting the Currency

- [1] Select .  
 [2] Select the currency.  
 ⇒ The results for this currency appear in the left-hand side of the main menu.

#### 18.3.1.3 Removing Delivery Area

- [1] Select .  
 ⇒ The delivery area is deleted.

### 18.3.1.4 Setting Program Parameters

In the "Parameters Setting" window you can configure the following program settings under three tabs.

- **System Configuration tab**



Figure 68: "System Configuration" Tab

Choose the language, assign a receipt title, configure the dialog settings

- **User Management tab**



Figure 69: "User Management" Tab

Add users

- **Exchange Rate Setting tab**

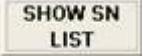


Figure 70: "Exchange Rate Setting" Tab

Set exchange rates

- [1] Select .
- [2] Select a tab.
- [3] Enter the data in the corresponding fields.

#### 18.3.1.5 Showing/Hiding Serial Numbers

- [1] Select .
- ⇒ The list of serial numbers appears in the right-hand side of the main menu.
- [2] Select .
- ⇒ The list of serial numbers disappears.

The serial numbers are displayed with various color codes. The color codes have the following meaning.

VALUE	SERIAL / PCS	SUB-TOTAL
1	2	2
2	0	0
5 88216785248	3	15
10	0	0
20 ED88329408	3	60
50	0	0
100 AE45064030A	1	100
<b>TOTAL</b>	<b>9 pcs</b>	<b>\$ 177</b>

Serial Number List		Import Black List	SN Filter	ImpFSN	ExpFSN
No.	NAT.	VALUE	SERIAL NUMBER NAME	SN OCA	
1	W#	00	GF58047409D	0058047409D	
2	W#	00	C34214134A	00124134A	
3	W#	100	D36152517A	00152517A	
4	W#	100	D36152517A	00152517A	
5	W#	20	CF58047409D	0058047409D	
6	W#	00	C34214434A	00124434A	
7	W#	00	C34214434A	00124434A	
8	W#	00	CF58047409D	0058047409D	
9	W#	20	CF58047409D	0058047409D	
10	W#	100		0012406788	

Figure 71: Displaying Serial Numbers

Color	Definition
Red	Serial number's OCR code is suspect
Blue	Serial number's OCR code was checked.
Purple	Serial number's OCR code is suspect and was checked.
Turquoise	A group of serial numbers is on the black list or was rejected by the fitness or SN sorting filter.
Orange	Serial number appears twice in the same bundle.

### 18.3.1.6 Setting SN Filter

You can select which type of serial number is to be sorted into the delivery stacker.

- [1] Select  **SN Filter**.



- [2] Select the character number, e. g. 2.  
 [3] Enter the characters of the SN, e. g. the first two characters of the SN.  
 [4] Click **OK**.  
 ⇒ The machine sorts the banknotes with the specified SN characters into the delivery stacker. The other banknotes are sorted into the reject stacker and the serial number is displayed in blue.

### 18.3.1.7 Using the Search List for Serial Numbers

You can use a search list or a so-called black list to sort banknotes with specific serial numbers. This search list must be available as a text file (.txt) in the following format:

'Name of currency','Serial number 1'  
 'Name of currency','Serial number 2'

---

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END

**Example:**

EUR,X10254860498

EUR,Y00758463221

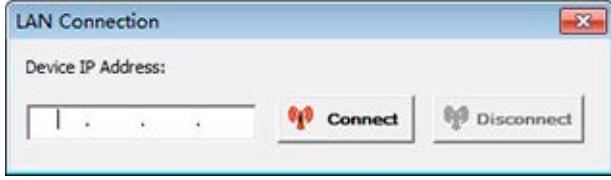
EUR,H21005874552

END

- [1]** Select .  
 ⇒ A new window opens.
- [2]** In this window select the search list.
- [3]** Select **Import**.  
 ⇒ The search list is imported.
- [4]** On completion confirm the dialog window.

**18.3.1.8 Setting IP Address**

If the machine is connected to the LAN, you can select its IP address.

- [1]** Select .
- 
- [2]** Enter the IP address of the machine.
- [3]** Select **Connect** to connect the machine to the LAN.

**18.3.1.9 Entering Banknote Data Manually**

You can manually enter banknote data for rejected banknotes.

- [1]** Select .

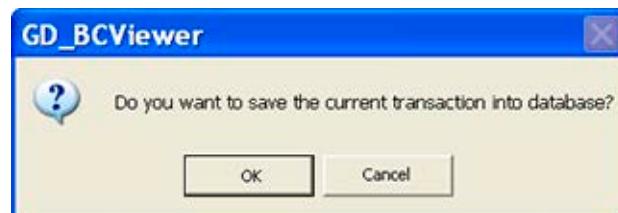


18

- [2] Select the banknote denomination in the drop-down menu of the **Currency Value** box.
- [3] Enter a serial number in the **Banknote Serial Number** box.

#### 18.3.1.10 Processing Result

- [1] Select  **Confirm Transaction**.



- [2] Click **Save**.



- [3] Enter the data in the corresponding fields.
- [4] Click **OK**.
- ⇒ The "Transaction Printing or Saving Process" window appears.



Figure 72: Viewer - Confirming Transaction

You can choose from the following options:

#### **PRINT SUM**

This prints out the results on a connected printer.



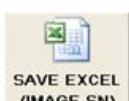
#### **PRINT SERI**

This prints out the results with the relevant serial number on a connected printer.



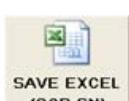
#### **SAVE EXCEL (IMAGE SN)**

This saves the results with the relevant serial number in image format to an EXCEL file.



#### **SAVE EXCEL (OCR SN)**

This saves the results with the relevant serial number in OCR format to an EXCEL file.




**CLOSE**

This terminates the process.

**18.3.1.11 Processing Ticket or Check Reading or Displaying Full Banknote Scan**

- [1] Select TITO Cheque.



- [2] Select ticket reading, check reading, or banknote scan.

⇒ The following information appears.

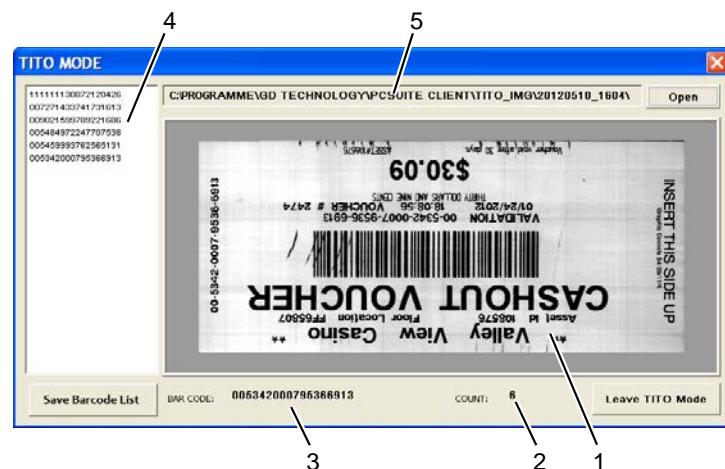


Figure 73: Tito Mode - Menu

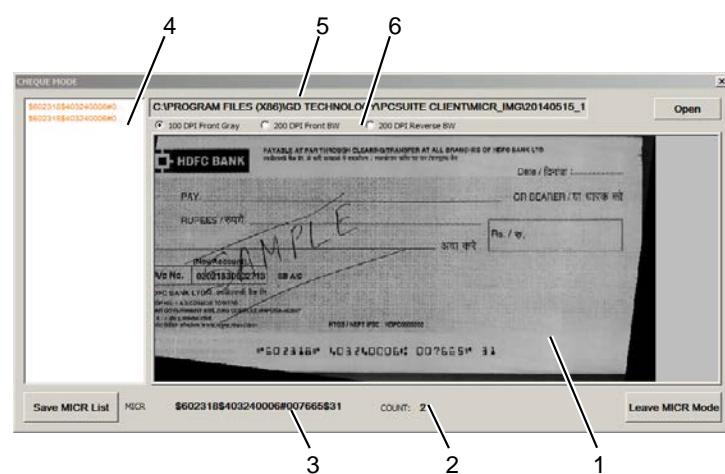


Figure 74: Check Reading Menu

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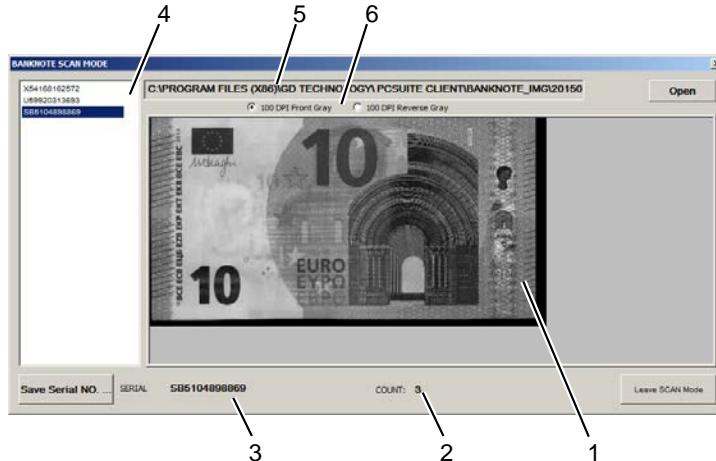


Figure 75: Banknote Scan Menu

- 1 Image of the last barcode/check read or the last scanned banknote
- 2 Number of all barcodes/checks/banknotes processed
- 3 Number of the decoded barcode/check from the image or serial number of the scanned banknote
- 4 All decoded barcodes/checks or all serial numbers of the banknotes  
The numbers marked in orange in the list are repetitions. The value given in brackets indicates the frequency.
- 5 Directory name of the saved images

#### Notes:

- The directory name is created using the date and time of processing.

The file name *20110823\_1821* stands for 08/23/2011 18:21.

Each barcode/check/banknote image is saved in this directory with the decoded barcode/check or the serial number as the file name.

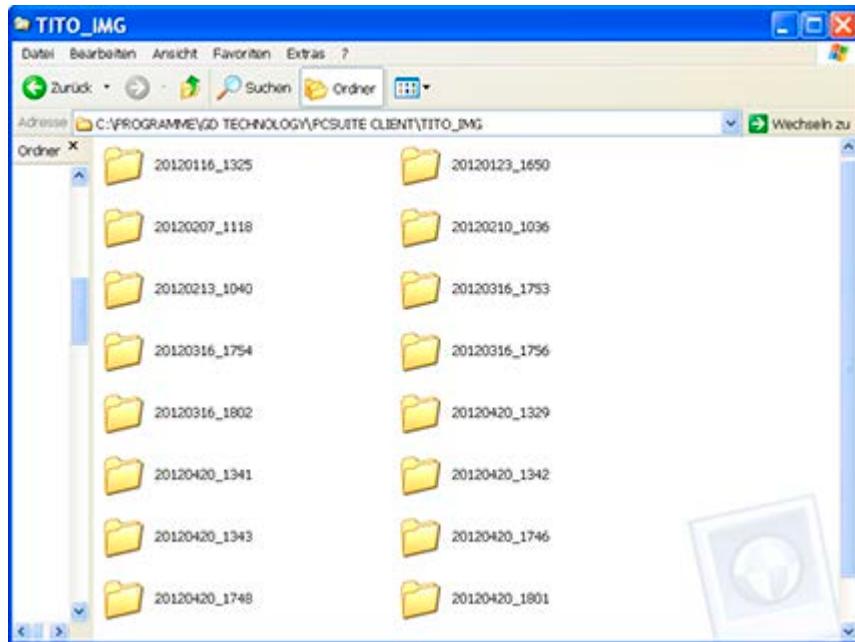
- The default directory used for saving is *C:\Programs\GD TECHNOLOGY\PCSUITE CLIENT\TITO\_IMG, ... \MICR\_IMG, or ... \BANKNOTE-IMG*.

- 6 Print resolution of the image and whether it relates to the banknote front/reverse

#### Opening the Directory

- [3] Select **OPEN** (6).

⇒ The directory for the current processing opens.



[4]

Double-click the directory to open.

⇒ The images of the barcodes/checks/banknotes read appear.

Example: Images of barcodes

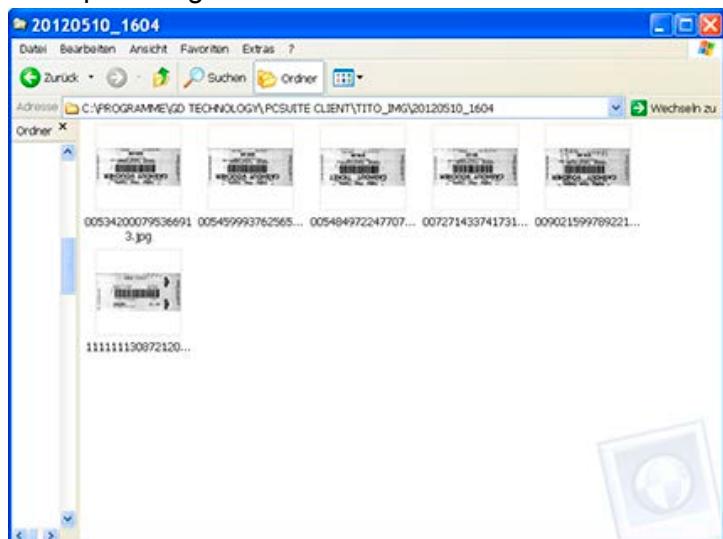


Figure 76: Tito Mode - Read Barcodes

[5]

You can save the list of all decoded barcodes/checks or the scanned serial numbers.

[5a]

**Saving the List of All Decoded Barcodes**

[5a-1]

Select **Save Barcode List**.

- [5a-2]** Save the list at the storage location you require.  
 ⇒ The list is saved as a text file (.txt).
- [5b]** **Saving the List of All Decoded Checks**
- [5b-1]** Select **Save MICR List**.
- [5b-2]** Save the list at the storage location you require.  
 ⇒ The list is saved as a text file (.txt).
- [5c]** **Saving the List of All Scanned Serial Numbers**
- [5c-1]** Select **Save Serial NO..**
- [5c-2]** Save the list at the storage location you require.  
 ⇒ The list is saved as a text file (.txt).

Ending TITO MODE

- [6a]** To end Tito Mode, select **Leave TITO Mode**.

Ending Check Reading

- [6b]** To end check reading, select **Leave MICR Mode**.

Ending Banknote Scan

- [6c]** To end the banknote scan display, select **Leave SCAN Mode**.

### 18.3.1.12 Displaying Reject Reasons

If banknotes have been rejected, you can display the rejects.

- [1]** Select .

⇒ The window with the rejects appears.

### 18.3.2 Using the Reader

After the result data has been processed with the GD Viewer, it is available for further analysis in the GD Reader.

The GD Reader is used with the help of the main menu shown below.

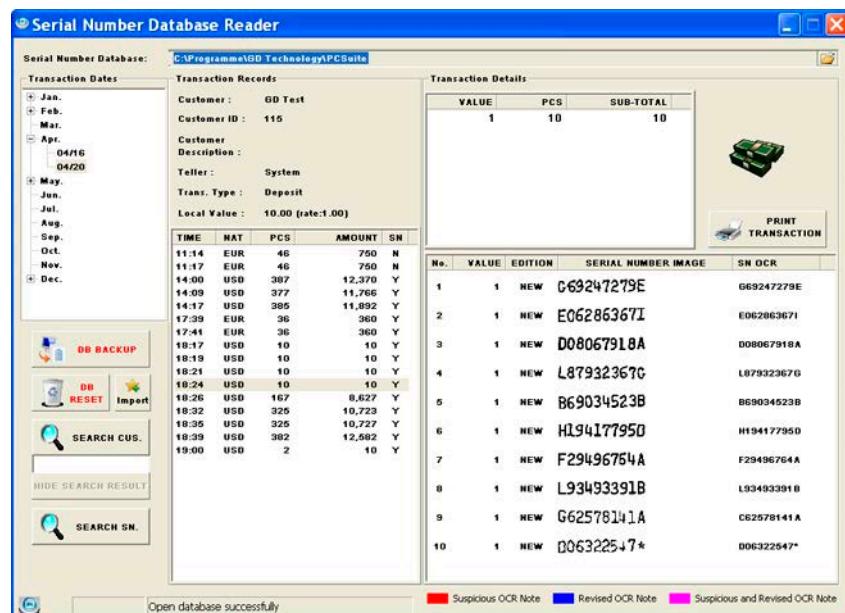


Figure 77: Main Menu of GD Reader

### 18.3.2.1 Starting the Reader

- [1] Start the Reader by double-clicking on the program name *GD\_SNDReader.exe*.  
⇒ The main menu appears.
- [2] Check the results displayed.  
You can find an explanation of the color codes in → *Figure 71 “Displaying Serial Numbers”, p. 258*.
- [3] Select one of the following functions.



#### DB BACKUP

Save the serial numbers as a file



#### Important!

The size of the data base is limited to 2 GB. As soon as you reach this limit, the data base can no longer be opened. A warning therefore appears as soon as the data base exceeds a size of 1 GB.

1. Save the data base with **DB BACKUP**.
2. Then reset the data base with **DB RESET**.



#### DB RESET

Reset and close the current database

**SEARCH CUS.**

Search banknote processing for a user

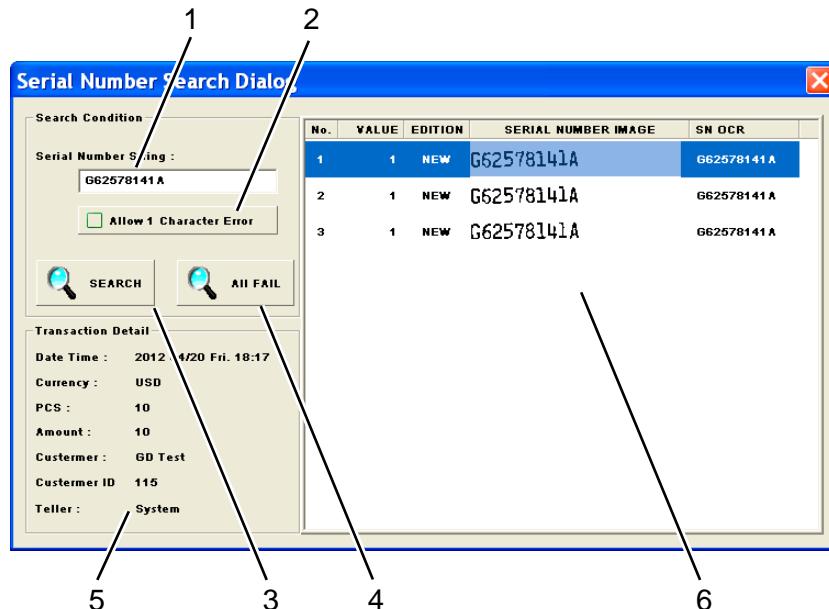
**SEARCH SN.**

Search banknote processing for a serial number

**18.3.2.2 Searching for Serial Numbers**

Below you will find a description of how to search for serial numbers.

- [1] Select **SEARCH SN..**



- [2] Enter the serial number in the **Serial Number String** box (1).
- [3] Select **Allow 1 Character Error** (2).
- ⇒ One mistake is permitted during the search.
- [4] Click **SEARCH** (3).
- [5] To search for suspect OCR codes, select **All Fail** (4).
- [6] Select a banknote from the right-hand side of the display area (6).
- ⇒ Detailed information appears in the **Transaction Detail** area (5).

## 18.4 Using the PCSuite – Distributor Tool

The GD\_PCSuite – Distributor Tool provides service functions that can be selected in the main menu.

This chapter describes the following functions:

- → *Section 18.4.1 “Showing Product Information”, p. 270*
- → *Section 18.4.2 “Setting up the Report Title”, p. 273*
- → *Section 18.4.3 “Changing the Password or IP Address ”, p. 274*
- → *Section 18.4.4 “Creating Reports”, p. 276*
- → *Section 18.4.5 “Changing the Machine Type ”, p. 277*
- → *Section 18.4.6 “Updating the Machine”, p. 282*
- → *Section 18.4.7 “Defining the Default Currency”, p. 286*
- → *Section 18.4.8 “Connecting LAN Explorer”, p. 287*
- → *Section 18.4.9 “Recording Banknote Data”, p. 288*

Requirements

"GD\_PCSuite" is available.



### Important!

The End User Tool and the Distributor Tool should not run simultaneously on your PC. Close one program before starting the other.

Starting the Distributor Tool

- [1] Start the Distributor Tool by double-clicking on the program name *Platformxxx\_x\_xxxxxxx.exe. GD\_PCSUITE*  
⇒ The main menu appears.

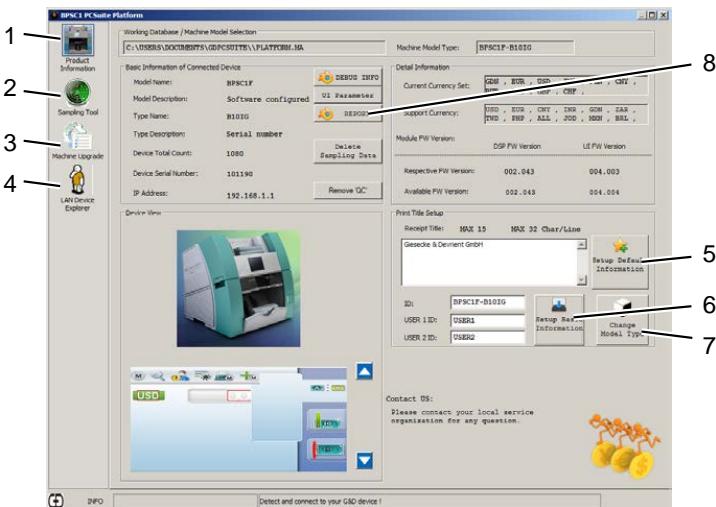


Figure 78: Distributor Tool - Main Menu

- 1 **Product Information** → Section 18.4.1 “Showing Product Information”, p. 270
- 2 **Sampling Tool** → Section 18.4.9 “Recording Banknote Data”, p. 288
- 3 **Machine Upgrade** → Section 18.4.6 “Updating the Machine”, p. 282
- 4 **LAN Device Explorer** → Section 18.4.8 “Connecting LAN Explorer”, p. 287
- 5 **Setup Default Info** → Section 18.4.3 “Changing the Password or IP Address”, p. 274
- 6 **Setup Basic Information** → Section 18.4.2 “Setting up the Report Title”, p. 273
- 7 **Change Model Type** → Section 18.4.5 “Changing the Machine Type”, p. 277
- 8 **REPORT** → Section 18.4.4 “Creating Reports”, p. 276

[2] Select the icon for the desired function.

#### 18.4.1 Showing Product Information

The product information for the connected BPS C1 is displayed in the main menu.

##### Showing Product Information

[1]

Select  in the main menu.

⇒ The current machine data are displayed.

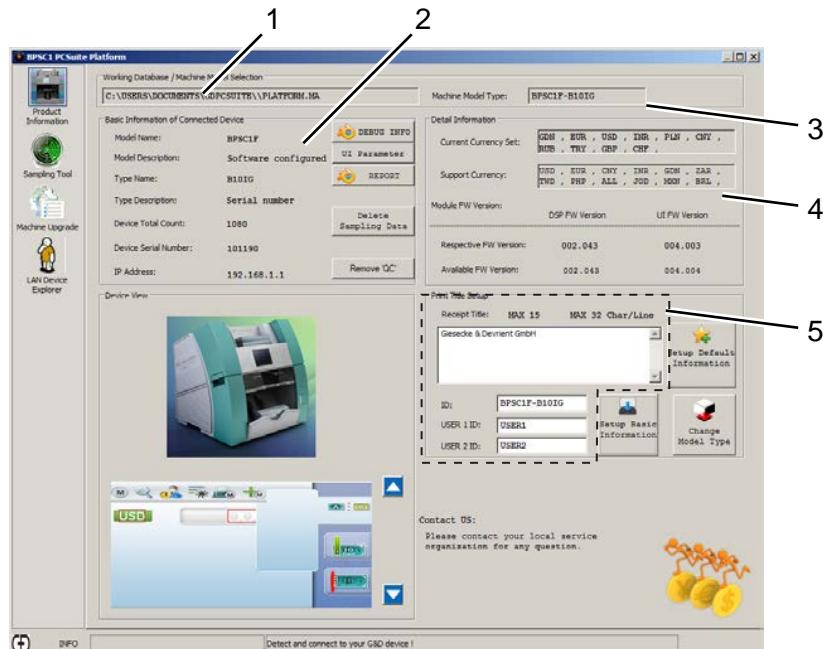


Figure 79: Product Information Menu

### 1 Working Database

Directory name for the system modules

### 2 Basic Information of Connected Device

Basic information about the connected device

- **Model Name**
- **Model Description**  
Model details
- **Type Name**  
Machine function
- **Type Description**  
Detailed function designation
- **Device Total Count**  
Number of processed banknotes
- **Device Serial Number**  
Device serial number
- **IP Address**

### 3 Machine Model Type

Machine model, for explanation see figure below.

#### 4 Detail Information

Additional information on the connected device

- **Current Currency Set**

Enabled currencies

- **Support Currency**

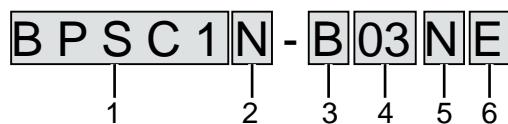
Released currencies for the license key (max. 10)

- **Module FW Version**

Firmware version

#### 5 Report Title

Machine Model



**Figure 80: Machine Model**

1 Name of the machine

**Banknote Processing System Compact1**

2 Function (can be changed)

- N = Deposit processing configuration (HW 2.0)
- F = Fitness sorting configuration (HW 2.0)
- D = Previous version for deposit processing (HW 1.0)
- G = Configuration for fitness sorting (HW 3.0)
- P = Configuration for deposit processing (HW 3.0)

3 Design

B = Standard (English keyboard); C = Special version (Chinese keyboard); I = Special version for India; R = Special version (Russian keyboard); U = Special version for USA and Canada

4 Number of currencies enabled (max. 10)

## 5 Optional functions

- S = Serial number reading
- T = Ticket reading (TITO Mode = reading casino tickets)
- C = Check reading
- M = Multi (serial number reading + ticket reading (TITO))
- G = Multi 2 (serial number reading + check reading)
- H = Multi 3 (ticket reading (TITO) + check reading)
- I = Multi 4 (serial number reading + ticket reading (TITO) + check reading)
- N = None

## 6 GUI language

B = Indonesian; E = English; F = French; G = German; I = Italian; K = Slovakian; L = Polish; P = Portuguese; R = Russian; S = Chinese; T = Turkish; V = Spanish

You can also output product information for the BPS C1 to the control unit.

→ See "BPS C1 User Manual, System Information"

### 18.4.2 Setting up the Report Title

Use the following procedure to set up the report title.

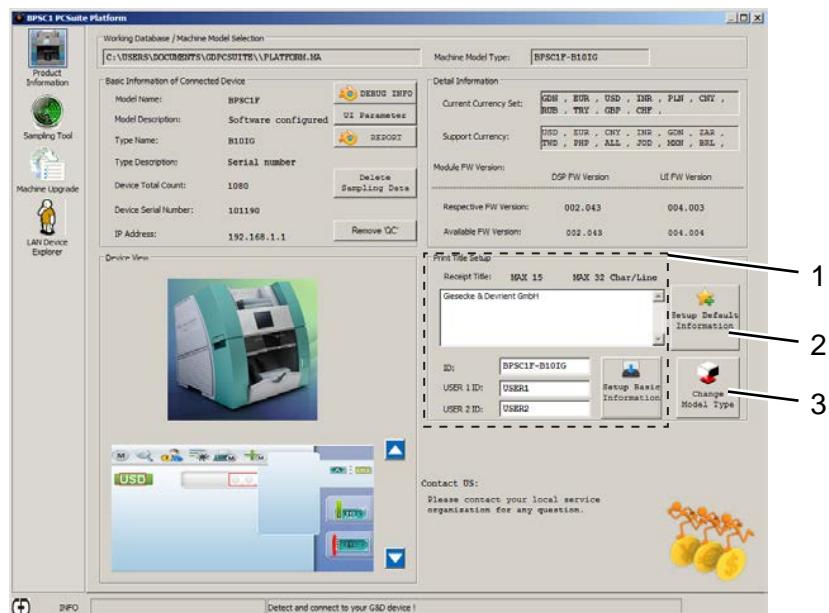


Figure 81: Product Information - Menu

1 → Section 18.4.2 "Setting up the Report Title", p. 273

- 2 → *Section 18.4.3 "Changing the Password or IP Address ", p. 274*  
 3 → *Section 18.4.5 "Changing the Machine Type ", p. 277*


**Important!**

If you use the XML report, you may not enter the following characters into the report head (report title, machine model and user identification):

- <
- >
- &
- "
- ,

If one of these characters is entered, the XML data is interpreted incorrectly and therefore cannot be used.

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## Setting up the Report Title

- [1] Enter text in the **Print Title Setup** area (1) (15 lines with 35 characters/line).
- [2] Enter the machine model designation and the user identification.
- [3] Select 
- ⇒ Your entries are stored in the connected device and the next reports will be printed out with this title.


**Important!**

The saved information will only be displayed in the menu once the machine has been restarted. Check the entries by carrying out a test print.

### 18.4.3 Changing the Password or IP Address

Proceed as follows to change the password or IP address:

#### Procedure

- [1] Select  in the main menu.
- ⇒ The following menu is displayed.

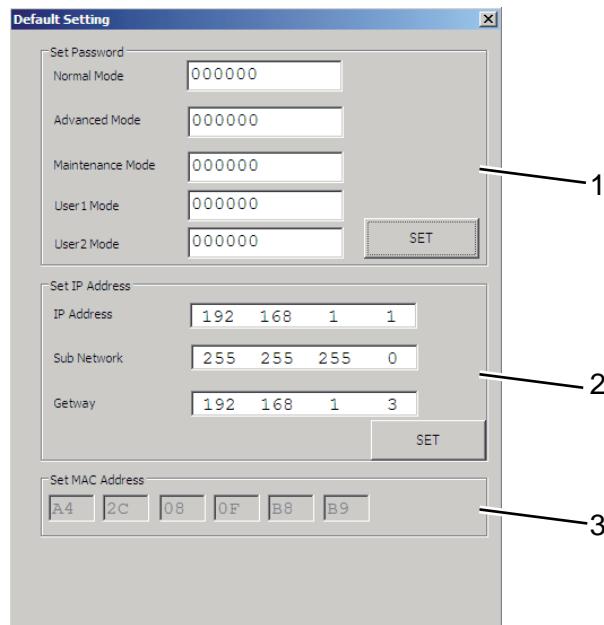


Figure 82: Default Settings

- 1 **Set Password**
- 2 **Set IP Address**
- 3 **Set MAC Address** (the MAC address is only displayed)

### Change Password

To change the password use **Part 1** of the menu.

You have the following input options:

- Password for Normal Mode
- Password for Advanced Mode (Supervisor)
- Password for Maintenance Mode
- Password for User1 Mode/User2 Mode

[2] Enter the password (six numerical characters).

[3] Select **SET**.

⇒ The password is saved and the main menu is displayed.

### Changing the IP Address

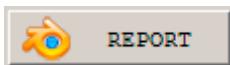
To change the IP address use **Part 2** of the menu.

[4] Enter the IP address.

[5] Select **SET**.

⇒ The data are saved and the main menu is displayed.

## 18.4.4 Creating Reports



You can select the following reports:

A detailed description of the individual reports can be found in the BPS C1 → "User Manual" in the appendix.

Service report as .bin text file

this time ServiceReport (bin)

this time ServiceReport (xml)

this time PaperReport

1~6 month PaperReport

Service report as an .xml file; you can send this file to your service partner/local service organization for error analysis.

Report: Fitness as .bin text file

Requirement for the data memory:

- An SD card is inserted into the back of the machine.

Summary of the Fitness report .bin text file for the first half year (period: 1 January – 30 June); new statements are added to this summary within this period. Once the second half year has begun, this summary is saved and you can always regenerate the saved values from the report during the second half year.

Requirement for the data memory:

- An SD card is inserted into the back of the machine.

Summary of the fitness report .bin text file for the second half year (period: 1 July – 31 December); new statements are added to this summary within this period. Once the first half of a new year has begun, this summary is saved and you can always regenerate the saved values from the report during the first half year.

Report: Deposit as .xml file;

this time XmlReport

Daily time ExcelReport

Report: Daily result as .xls Excel file; enter the day desired in the format year / month / day. The year always has four digits; the month and day have one to two digits (e.g. 2015/10/22 or 2015/8/4).

The content of the report depends on whether the SD card is inserted on the back of the machine:

- without SD card – simple list (denomination, number, total value)
- with SD card – complete list

Storage Location for Reports

The following reports are saved in the directory in which the "GDPCSuite" software is also saved:

- this time ServiceReport
- this time PaperReport
- 1~6 month PaperReport

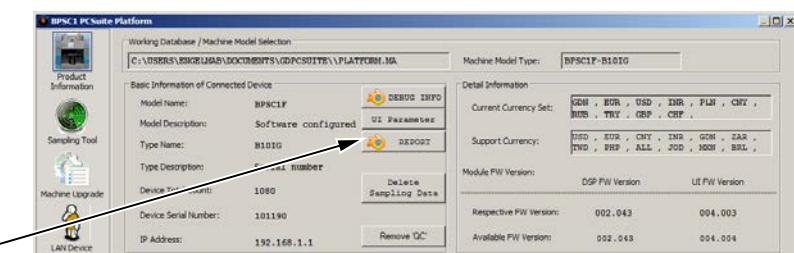
- 7~12 month PaperReport
- this time XmlReport
- Daily time ExcelReport

For the following report, you can enter the storage location the first time:

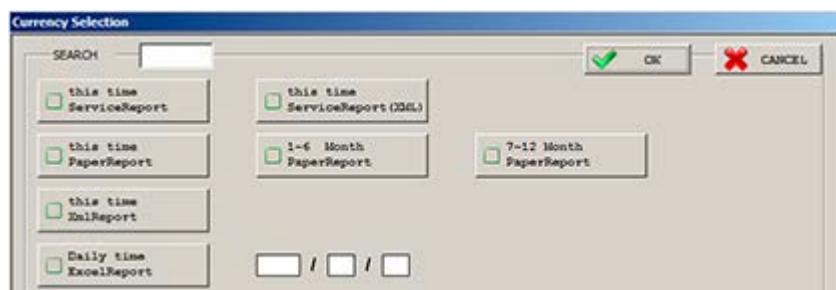
- this time ServiceReport (XML)

Then the report is always saved at the storage location specified. Ensure that you select a directory that is always available and that has an unchangeable name.

### Procedure



[1] Select **REPORT** in the main menu.



[2] Select the desired report and confirm by clicking **OK**.

⇒ When the report has been successfully created, a message appears with the storage location details.

[3] Press **OK** to confirm the message.

⇒ The report is saved to the directory specified.

### 18.4.5 Changing the Machine Type

Extending the Machine Function

You can expand the machine type using a license key for the BPS C1. You can increase the number of currencies available or release the serial number reading and/or ticket reading (TITO Mode) functions.

Updating Software Components

License key is available

To update the software, see → *Section 18.4.6 “Updating the Machine”, p. 282.*

You can obtain two different license keys from your service partner/local service organization.

- License key to extend the machine functions
- License key for a machine without software (e.g. after replacing circuit board A)

If you wish to request a license key, the following information is required:

- Device serial number
- Old model type
- New model type

Once you have updated the machine using the license key, for the machine a release of currencies is required.

Requirement

New license key

Entering the License Key

[1]

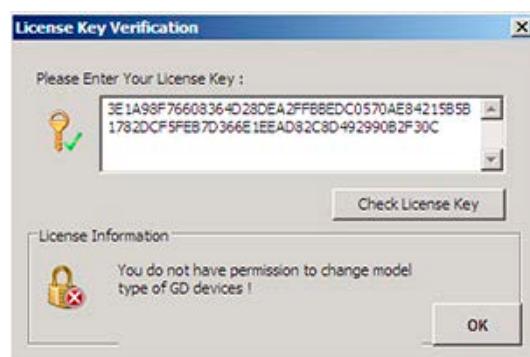


Select

in the main menu.

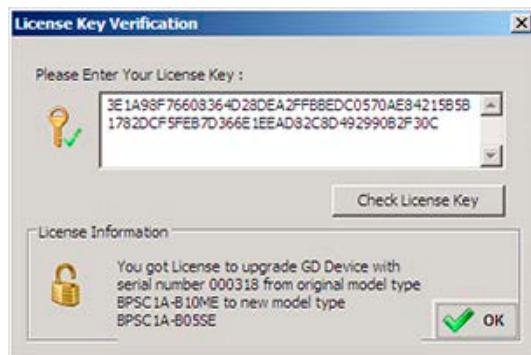
[2]

Enter the license key.

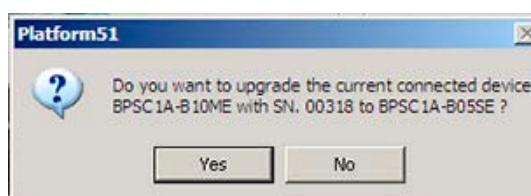


[3]

Select **Check License Key**.



[4] Confirm the "License Key Verification" using **OK**.



[5] Confirm the message by pressing **Yes**.

#### Releasing a Currency

Release the currencies installed using the license key as follows.

[1]

Select

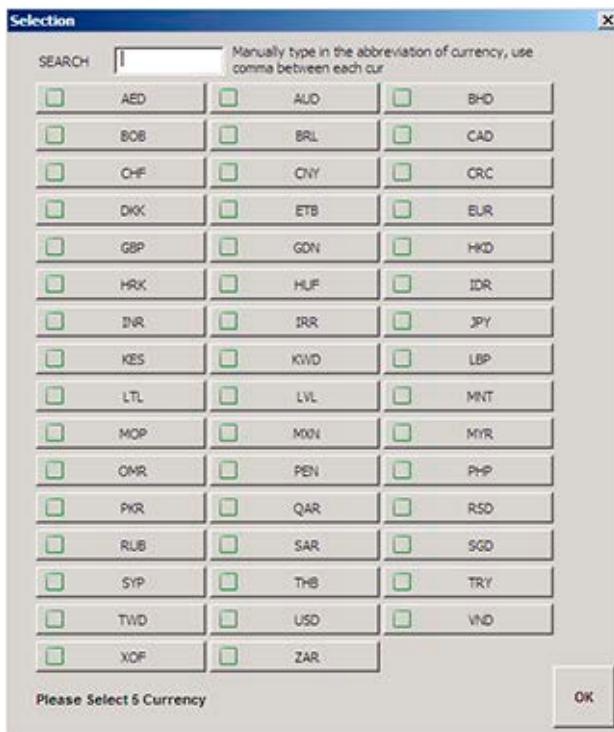


⇒ In the displayed menu the **Detection Module Upgrade** area contains a question mark.



Figure 83: Detection Module Upgrade Area

[2] Click **Select Currency Set**.



- [3] Select the currencies. You have two options.
- [3-1] Mark the currencies in the menu that is displayed.
- [3-2] Enter the currencies separated by a comma in the **SEARCH** box.
- ⇒ The currencies are marked.
- ⇒ Only certain currencies that have been released using the license key can be marked.

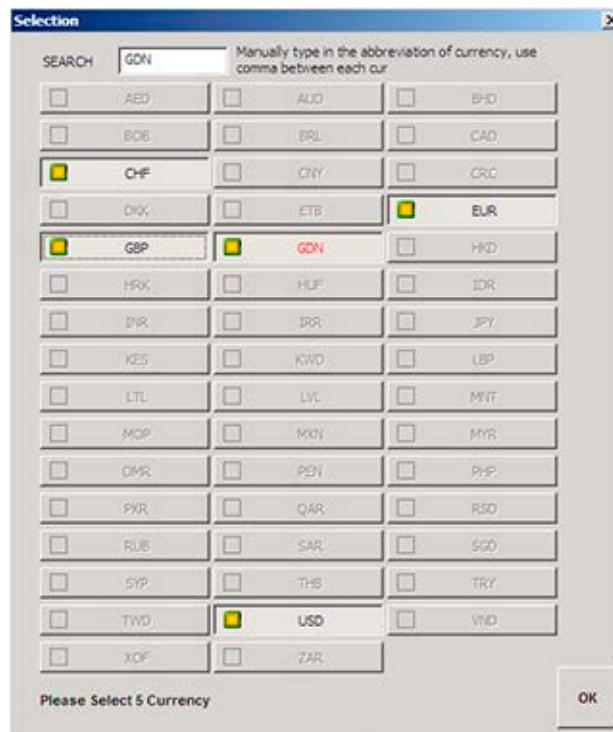


Figure 84: Available Currencies

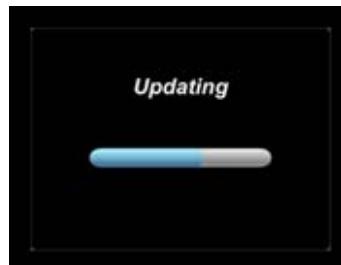
[4] Click **OK**.

⇒ The selected currencies are enabled.

#### Starting the Upgrade

[5] Select Upgrade in the **Detection Module Upgrade** area.

⇒ The progress of the update is displayed on the screen.



#### Restarting the Machine

Depending on the UI software version (V004.015 or higher), the machine starts automatically after 3 seconds.

A seconds counter appears on the operating unit of the machine.

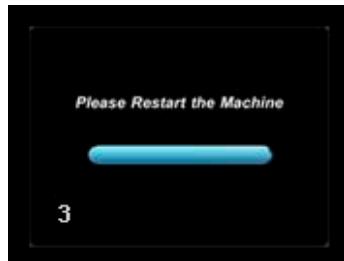


Figure 85: Seconds Counter for Automatic Restart of the Machine

Restart the machine, if it does not start automatically.

[6] Switch off the machine.

[7] Switch the machine on again.

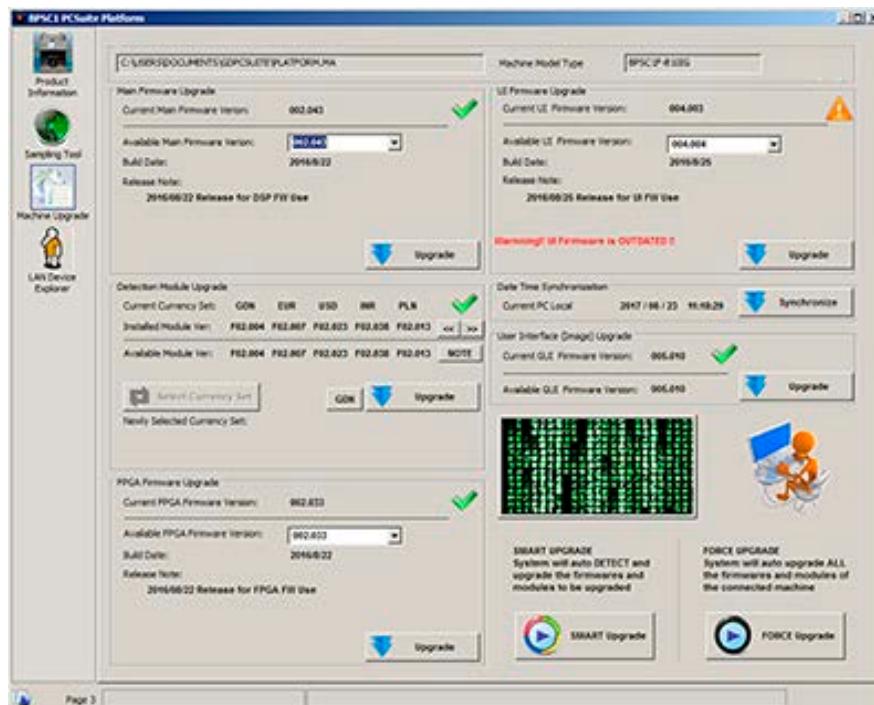
#### 18.4.6 Updating the Machine

You can easily check and update the software version of the connected BPS C1 via the program menu. The current and available firmware version is displayed for each software component.

In addition, you can define a default currency for the user interface.

##### Updating the Firmware

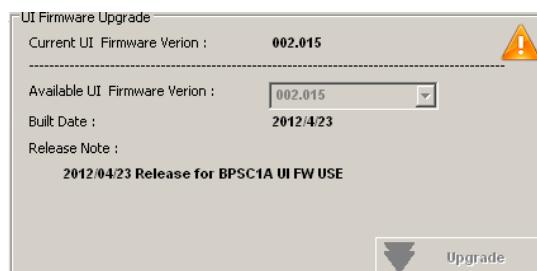
[1] Select  in the main menu.



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**[2] Check the display.**

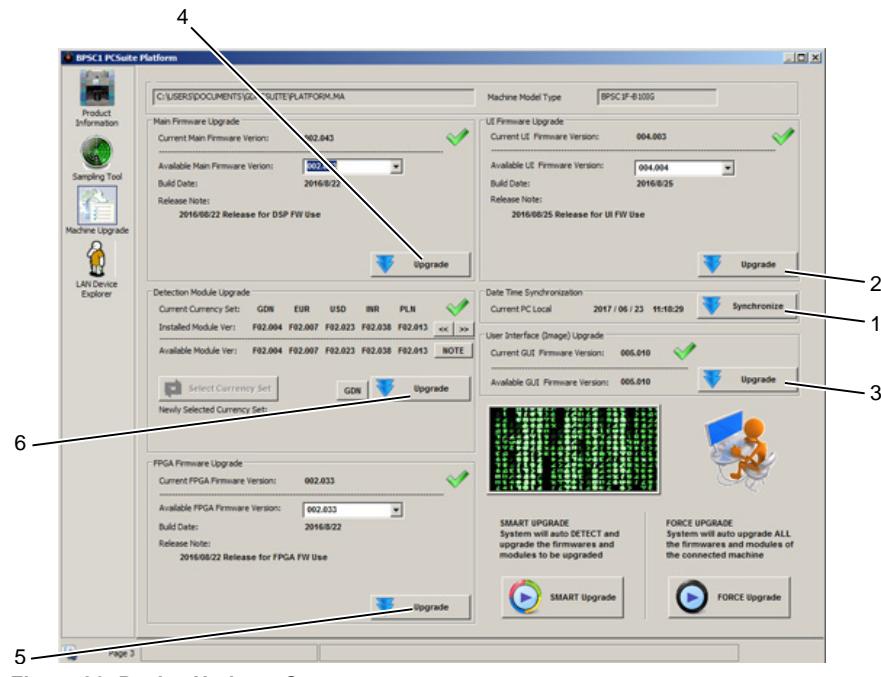
- A green tick means that the latest version is installed.
- If the versions do not match, an orange triangle with a warning will appear next to the affected component.



**[3] Always update the machine if a warning triangle is displayed for a component.**

**Important!**

Please follow the below procedure steps when carrying out the update.



**Figure 86: Device Update - Steps**

1. Synchronize the PC with the BPS C1
2. UI Firmware Upgrade software
3. USER Interface (Image) Upgrade
4. Main Firmware Upgrade
5. FPGA Firmware Upgrade
6. Detection Module Upgrade

### Synchronizing the PC and BPS C1

Before updating, synchronize the date and time of the PC and the BPS C1.

- [4] Select **Synchronize**.

⇒ Date and time are transferred from the PC to the BPS C1.

Perform the software component update as follows.

- [5] Select **Upgrade**.

## Starting the Update

[6] Confirm with **OK**.

⇒ The progress of the update is displayed.

- On the PC screen

The black and green matrix is running.

The progress bar at the lower edge of the menu gets bigger.

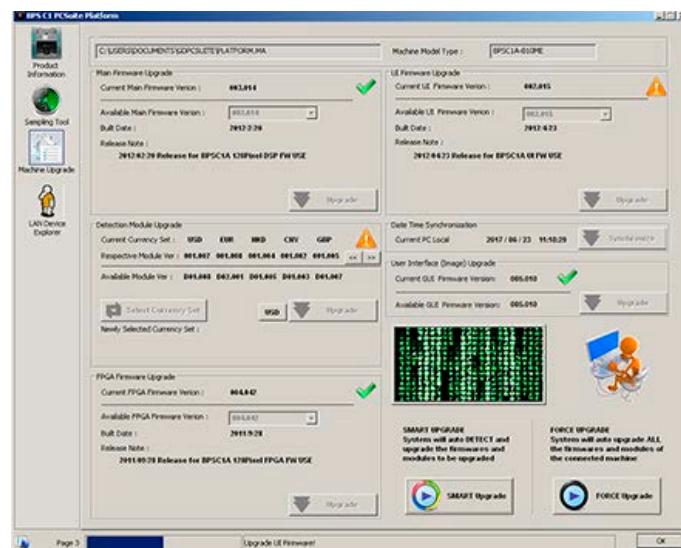


Figure 87: Machine Update - Progress

- On the operating unit of the machine

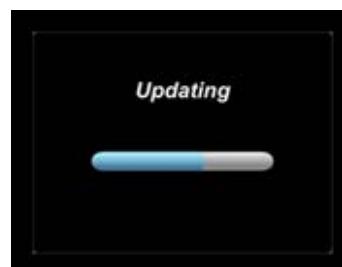
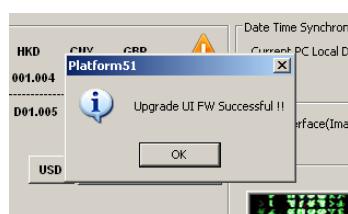


Figure 88: Machine Update - Progress



[7] After the update, confirm the message on the PC screen.

Machine - Automatic  
Restart

⇒ The machine starts automatically after 3 seconds. A seconds counter appears on the operating unit of the machine.

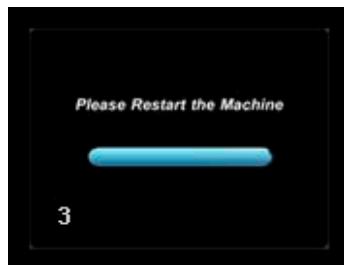


Figure 89: Seconds Counter for Automatic Restart of the Machine

## Additional Option

In addition to the procedure described above, with the Distributor Tool you can also update the machine using the following buttons:



Only components with lower version numbers are updated.



All components are updated. This function may take a long time.



### Important!

Once the first components have been updated, the request to restart appears on the machine. Ignore this message, as the machine restarts automatically when the update is complete.



### Important!

If you have updated individual components or the machine using the SMART Upgrade option, you must then update the USER interface (images), see → *Figure 78 “Distributor Tool - Main Menu”, p. 270 (3)*.

Note: If an error occurs when using the FORCE Upgrade option to update, confirm the error message and restart the option. The upgrade begins at the point at which the error occurred and continues on from there.

### 18.4.7 Defining the Default Currency

Follow the steps below to define the default currency for the user interface.

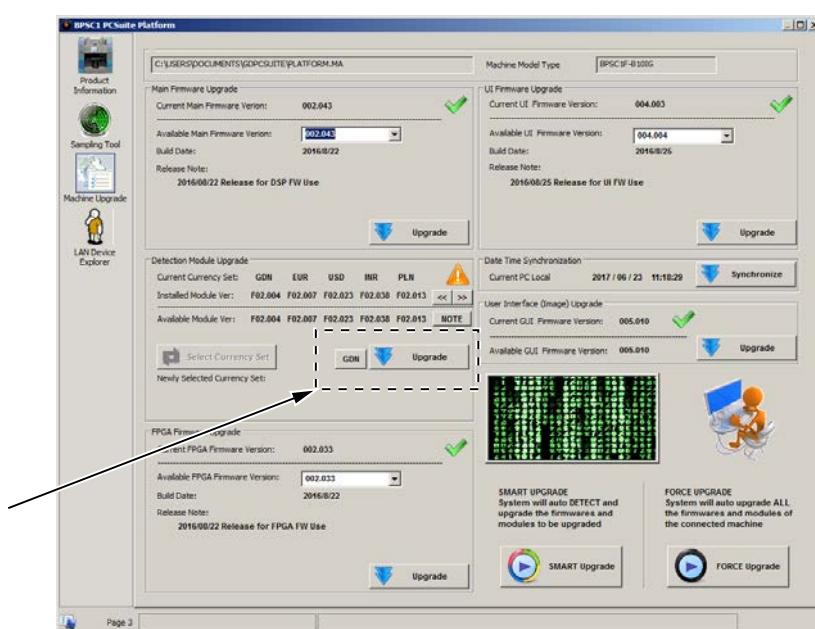
## Defining the Default Currency

[1]

Select



in the main menu.



[2]

Select the Currency button.

⇒ The installed currencies are displayed.

[3]

Mark the desired currency.

[4]

Select .

⇒ After the machine has been started, the selected currency will be displayed at the top left of the operating unit.

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### 18.4.8 Connecting LAN Explorer

The machines available in the network are displayed in LAN Explorer.

You can update software and adaptations for the machines via the LAN interface.

Follow the steps below to connect LAN Explorer.

#### Procedure

[1] Connect the LAN cable.

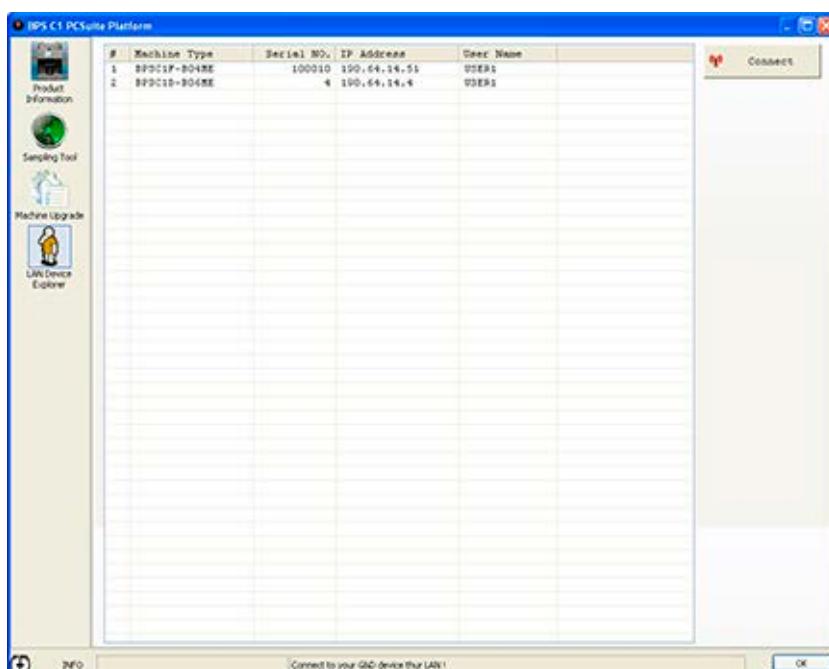
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## Starting LAN Explorer

[2]

Select  in the main menu.

⇒ LAN Explorer is displayed.



[3]

Select the desired entry.

## Connecting the Machine

[4]

Select  in the Explorer menu to establish the connection.

### 18.4.9 Recording Banknote Data

You can extend and stabilize the adaptation by recording the following data:

- New currencies
- Suspicious and counterfeit banknotes
- Unknown banknotes

Record the banknotes by following the below steps:

- Resetting raw data

## Requirement

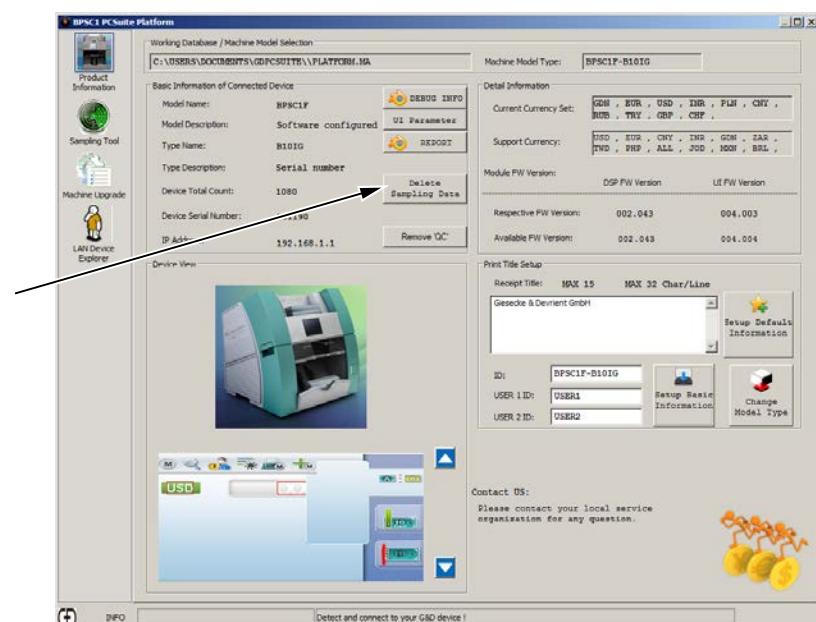
- Selecting the recording mode
  - Recording raw data
  - Recording rejects
  - Recording counterfeits
- Importing banknotes

## Resetting Raw Data

[1]



Select **Product Information** in the main menu.



[2] Click **Delete All Sampling Data**.

[3]



⇒ The machine is blocked and the following message is displayed:

- On the operating unit of the machine

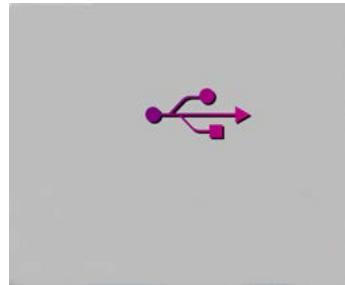


Figure 90: Machine in Service Mode

- On the PC screen

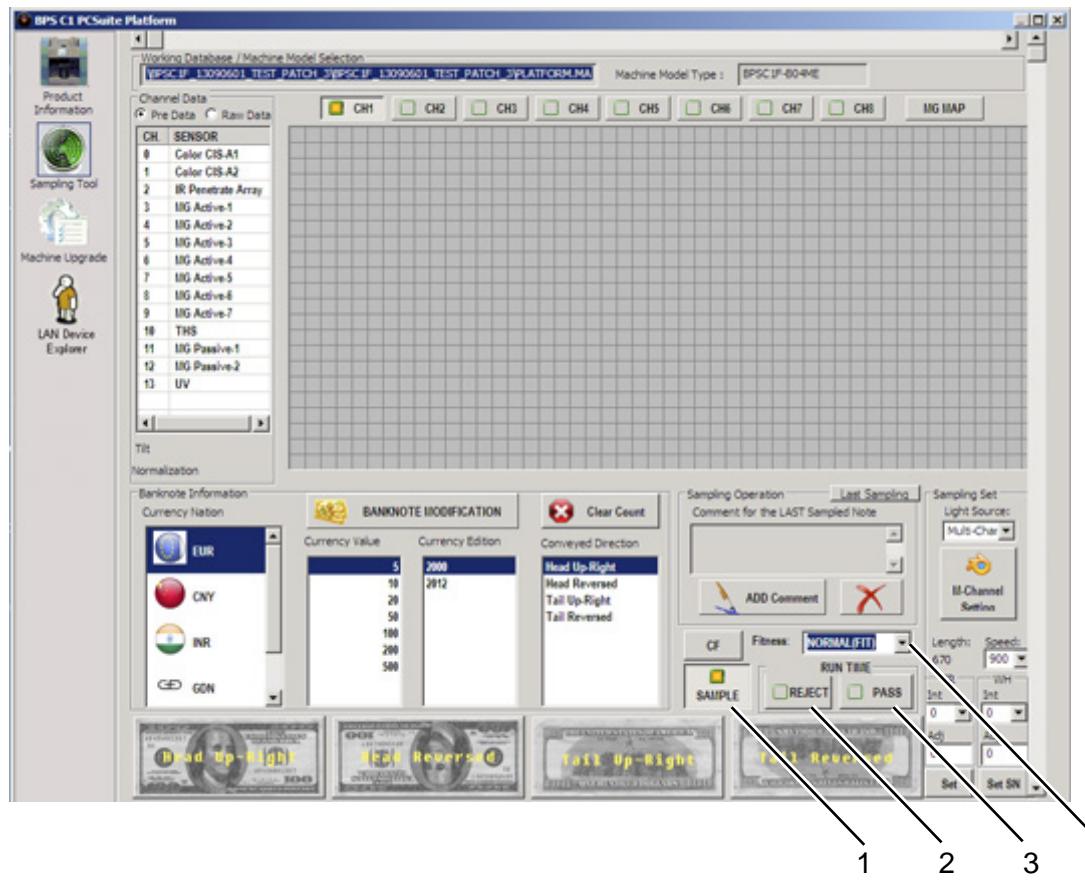


Figure 91: Menu – Sampling Tool

### Selecting the Recording Mode

Select one of the following four procedures for recording raw data.

-  (1)

Record banknote data (650 BN/min with 50 dpi)

Use this setting to record all banknotes in the delivery stacker.



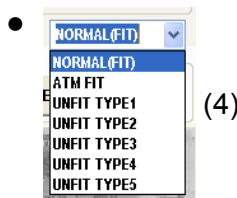
Record rejects (1200 BN/min with 10 dpi)

Use this setting to record all banknotes in the reject stacker.



Record new counterfeits (1200 BN/min with 10 dpi)

This setting is used to record counterfeits that have been accepted as real banknotes. Other objects that have been recognized as real denominations can also be recorded. To mark the recorded data as counterfeits, select the **CF** button.



Record different classes of raw data.

- [4] Select the button for the recording mode (at the bottom right of the menu).

## Importing Banknote Data

Before importing, define the banknote data in the **Banknote Information** area.

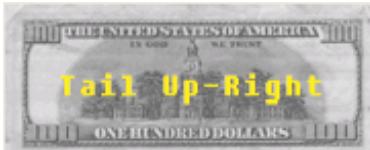
- [5] Select the currency under **Currency Nation**.
- [6] Select the currency value under **Currency Value**.
- [7] Select the edition (issue) under **Currency Edition**.
- [8] Select the banknote orientation under **Conveyed Direction**.  
A bundle of 100 banknotes is recommended for recording.
- [9] Select **Head Up-Right** (Orientation 1)



- [10] Place the banknote bundle in the singler the selected way round.

---

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- ⇒ The raw data are saved in the directory C:\Program Files\GD Technology\BPSC1\_PCSuite\2DSample.
- [11] Select **Head Reversed** (Orientation 2)
- 
- [12] Place the banknote bundle in the singler the selected way round.
- ⇒ The raw data are saved in the directory C:\Program Files\GD Technology\BPSC1\_PCSuite\2DSample.
- [13] Select **Tail Up-Right** (Orientation 3)
- 
- [14] Place the banknote bundle in the singler the selected way round.
- ⇒ The raw data are saved in the directory C:\Program Files\GD Technology\BPSC1\_PCSuite\2DSample.
- [15] Select **Tail Reversed** (Orientation 4)
- 
- [16] Place the banknote bundle in the singler the selected way round.
- ⇒ The raw data are saved in the directory C:\Program Files\GD Technology\BPSC1\_PCSuite\2DSample.
- [17] Send a zip file containing the 2DSample directory and the Platform.ma file from the directory C:\Program Files\GD Technology\BPSC1\_PCSuite to G+D.

## A Technical Data

The following table lists the other technical data:

	<b>Values</b>
Maximum transport speed	1,300 BIN/min for item counting (Accounting mode: <b>Count mode</b> ) 1,050 BN/min for fitness detection, serial number reading, and barcode reading You can also manually set three different speed levels.
Deposit capacity (singler)	ca. 500 BN depending on the banknote quality
Stacker capacity	Delivery stacker – 300 BN Reject stacker – 100 BN
Banknote formats handled	Length: 85 - 190 mm Width: 60 - 100 mm Thickness: 0.08 - 0.12 mm
Number of adaptations	Up to 10 adaptations can be made on the machine.
Display	TFT color screen, 3.5 " (inches)
Power supply connection	100 – 240 V AC 50/60 Hz
Electrical power consumption	max. 200 W
Fuse protection	3.15 A/250 V, medium slow-blow fuse
Dimensions	350 x 333 x 350 mm (depth x width x height)
Weight	approx. 16 kg
Transport system	Friction rollers
External devices (optional)	<ul style="list-style-type: none"> <li>● Thermal printer</li> <li>● Barcode reader</li> <li>● PC</li> </ul>

**A**

	<b>Values</b>
	<ul style="list-style-type: none"> <li>● External display</li> <li>● SD card</li> </ul> <p><u>Recommendation:</u></p> <ul style="list-style-type: none"> <li>– HW: SDHC, C10 &amp; C4</li> <li>– Capacity: 4GB-16GB</li> <li>– SW: FAT32, 4096 (4K)</li> </ul> <ul style="list-style-type: none"> <li>● LAN interface</li> </ul>
Sensors	<ul style="list-style-type: none"> <li>● Image sensor</li> <li>● Magnet</li> <li>● Infrared</li> <li>● Security thread</li> <li>● Fluorescence</li> <li>● Mechanical thickness sensor*</li> </ul>

**Table 1: Technical Data**

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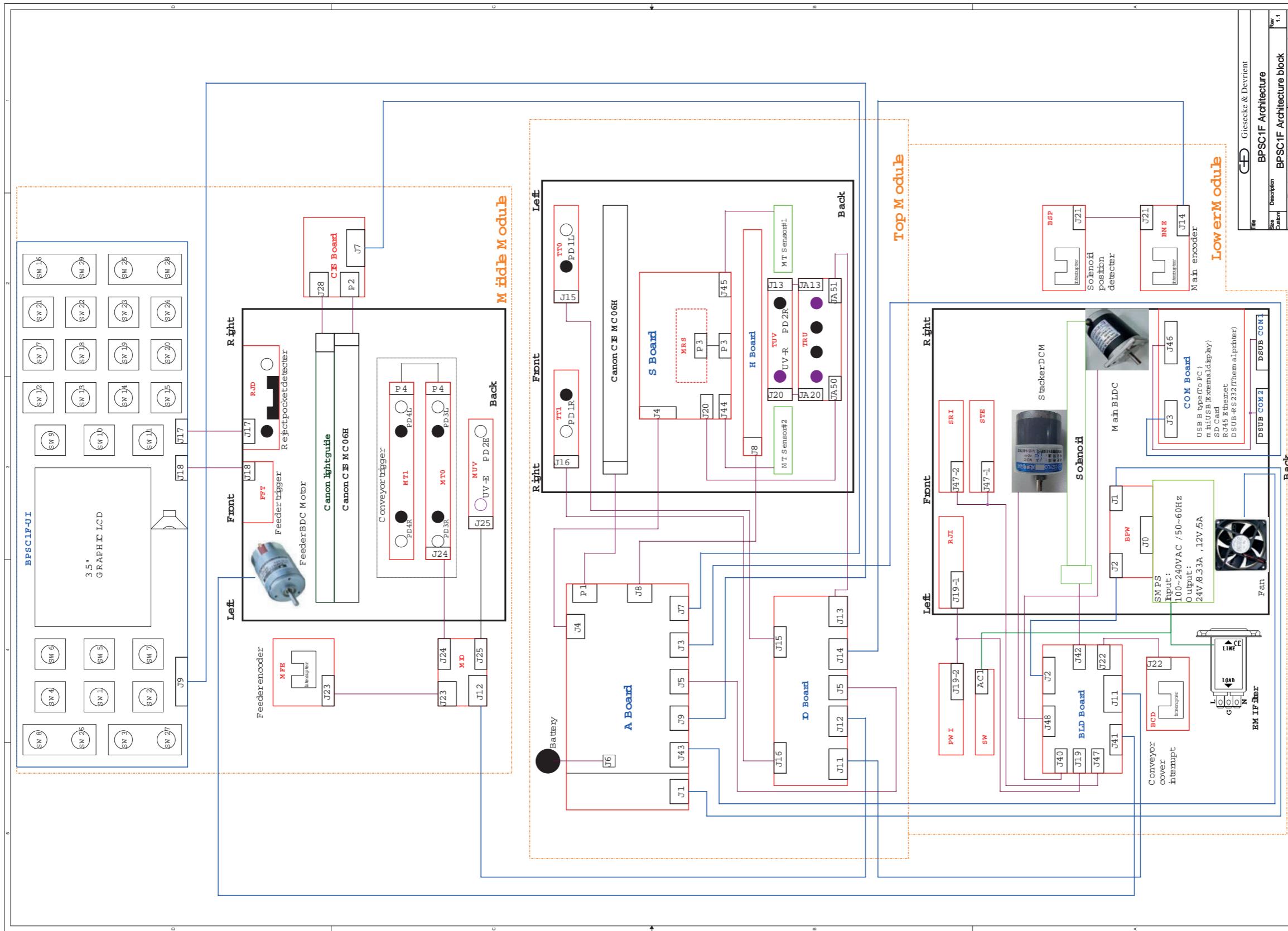
## B Cabling Diagram

**B**

---

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## C Belt Diagrams

In this chapter, you are informed about the positions of the toothed belts. There are toothed belts on both sides of the machine. For the replacement of the toothed belts, see:

→ *Chapter 12 “Replacing Toothed Belts”, p. 123*

### C.1 Toothed Belt A

Toothed belt A; 153/6 mm is on the axle of the friction element set in the middle module. For the replacement, see:

→ *Section 10.7 “Removing Feeder Roller Assembly”, p. 73*

There are seven toothed belts on the left side of the machine. The belts are different depending on the serial number of the device.

C

## C.2 Toothed Belts Left Side (Serial Number T0100016 - T0100815, T1100816 - T1102060, T1102080 - T1102726)

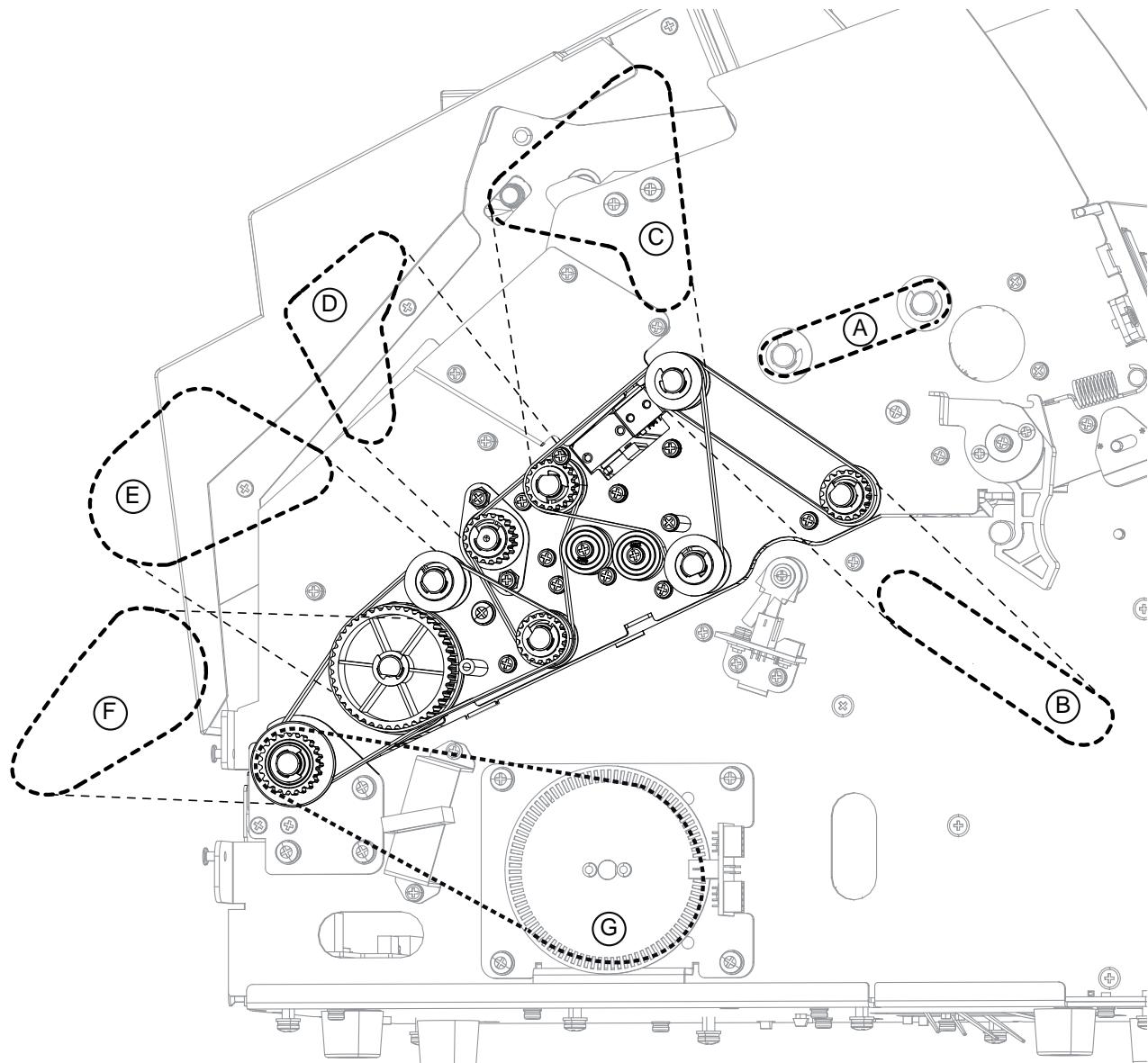


Figure 92: Belt Diagram - Left Side (Serial Number T0100016 - T0100815, T1100816 - T1102060, T1102080 - T1102726)

- A Toothed belt A; 153/6 mm
- B Toothed belt B; 189/6 mm
- C Toothed belt C; 228/5 mm
- D Toothed belt D; 171/5 mm
- E Toothed belt E; 207/5 mm
- F Toothed belt F; 192/6 mm
- G Toothed belt G; 300/6 mm

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### C.3 Toothed Belts Left Side (Serial Number T1102061 - T1102079, T1102727 and Higher, M0300001 and higher)

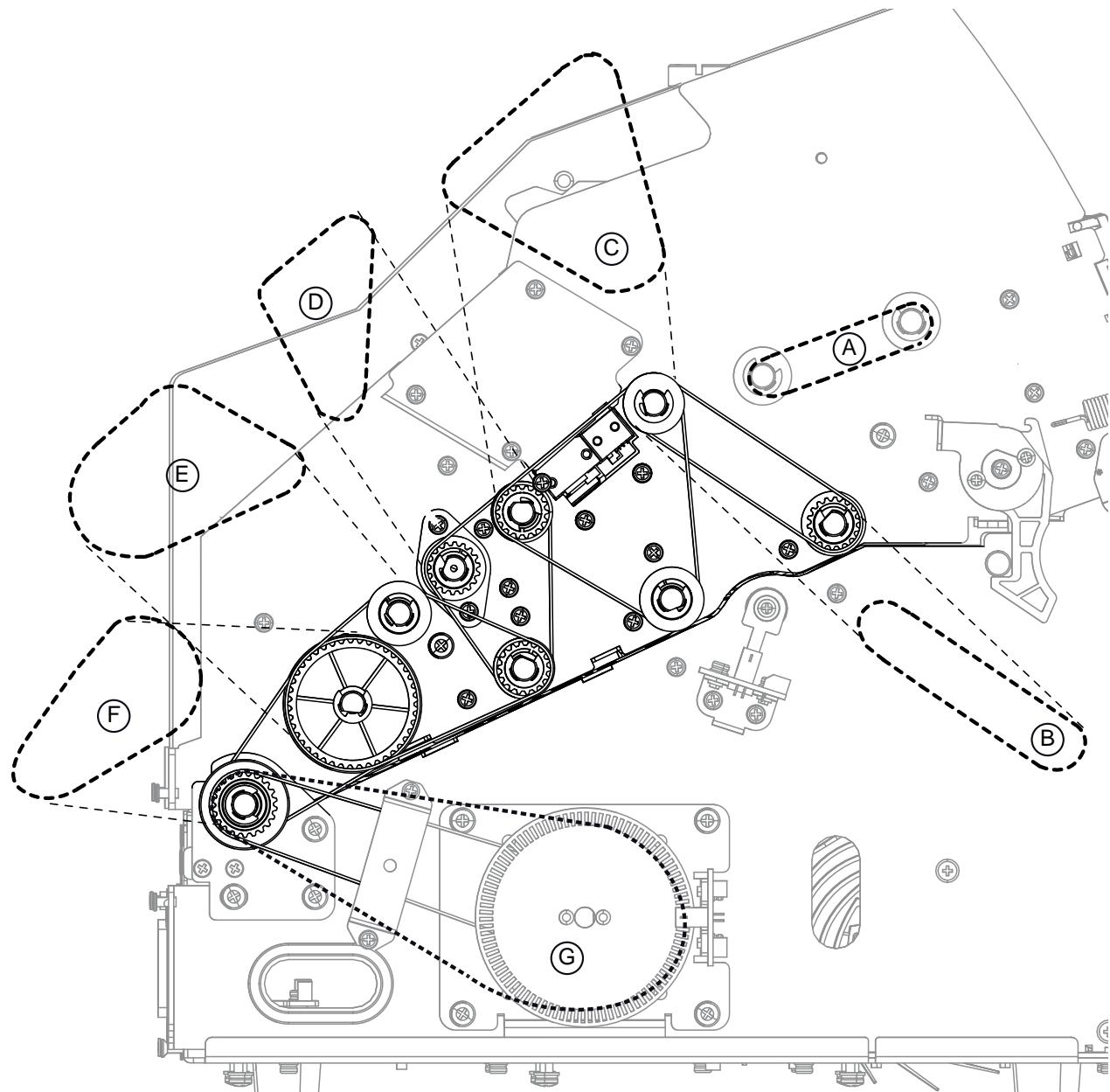


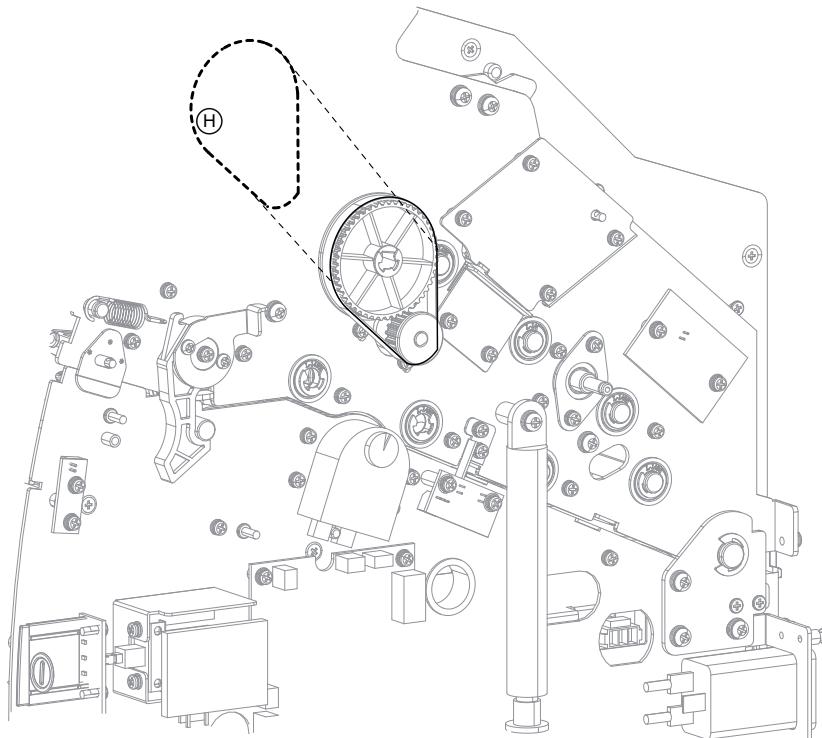
Figure 93: Belt Diagram - Left Side (Serial Number T1102061 to T1102079, T1102727 and Higher, M0300001 and higher)

- A Toothed belt A; 153/6 mm
- B Toothed belt B; 189/6 mm
- C Toothed belt C; 222/5 mm
- D Toothed belt D; 168/5 mm
- E Toothed belt E; 213/5 mm
- F Toothed belt F; 192/6 mm
- G Toothed belt G; 300/6 mm

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## C.4 Toothed Belt Right Side

There is one toothed belt on the right side of the machine.



**Figure 94: Belt Diagram - Right Side**

H Toothed belt H; 177/5 mm

## D Cable Harness

---

D

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### List of Cable Harness BPS C1

Material Number	Material Name	
283935xx1	POWER SOCKET WITH CABLE	
503521xx0	RIBBON CABLE	P1-A -> Up CIS
503522xx0	RIBBON CABLE	P2-Lo CIS->CIS
503523xx0	RIBBON CABLE	P3-S -> MRS
503524xx0	RIBBON CABLE	P4-MT0 -> MT1
503915xx1	CABLE, PREFABRICATED	AC1-EMI-SW-SPS
510304xx1	HARNESS	E2-MRS ESD
510305xx1	HARNESS	G1-GND
510306xx1	HARNESS	J1-BPW to A
510307xx1	HARNESS	J2-BPW to BLD
510308xx1	HARNESS	J3-A to COM
510309xx1	HARNESS	J4-A to S
510310xx1	HARNESS	J5-A to IO
510311xx1	HARNESS	J7-A to CIS
510312xx1	HARNESS	J8-A to H
510313xx1	HARNESS	J9-A UI
510314xx1	HARNESS	P1-A to CIS
510315xx1	HARNESS	P2-CIS to CIS
510316xx1	HARNESS	P3-S to MRS
510317xx1	HARNESS	P4-MT0 to MT1
510318xx1	HARNESS	EMI to SW/SPS
510319xx1	HARNESS	AC2-SPS
510320xx1	HARNESS	J11-IO to BLD
510321xx1	HARNESS	J12-IO to MIO
510322xx1	HARNESS	J13-TRU to TUV
510323xx1	HARNESS	J14-IO to BME
510324xx1	HARNESS	J15-IO to TT0
510325xx1	HARNESS	J16-IO to TT1
510326xx1	HARNESS	J17-UI to RJD
510327xx1	HARNESS	J18-UI to FFT
510328xx1	HARNESS	J19-BLD-RJ/PWI
510329xx1	HARNESS	J20-TRU to TUV
510330xx1	HARNESS	J21-BME to BSP
510331xx1	HARNESS	J22-BLD to BCD
510332xx1	HARNESS	J23-MIO to MFE
510333xx1	HARNESS	J24-MIO to MT0
510334xx1	HARNESS	J25-MIO to MVU
510335xx1	HARNESS	J28-CIS - LIGH
510336xx1	HARNESS	J41-BLD-FEED
510337xx1	HARNESS	J46-COM - DSub
510338xx1	HARNESS	J48-BLD-STK
510339xx1	HARNESS	J50-TRU to S
510340xx1	HARNESS	J51-TRU to IO
510341xx1	HARNESS	E1-Stacker ESD
510342xx1	HARNESS	J47-BLD-STE/SRI
510351xx1	SPEAKER	UI to SPK

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## Glossary

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### A

A	ampere (physical unit of current)
AC	alternating current

### C

CD	compact disk digital storage medium
COM	serial interface for data transmission between devices
CPU	central processing unit

### D

DVD	digital versatile disk digital storage medium
-----	--

### E

ECB	European Centralbank
EMI	electromagnetic interference signals or emissions impairing the function of other devices
EN	European standard
Ethernet	technology for specification of data exchange in local networks
EU	European Union (since December 1, 2009)

### G

GB	gigabyte (unit of measurement for data volumes)
GS	“Geprüfte Sicherheit” = “tested safety” certification
GUI	graphical user interface

**H**

HW	hardware mechanical and electrical equipment of a system
Hz	hertz (physical unit of frequency)

**I**

IEC	International Electrotechnical Commission
-----	---

**L**

LAN	local area network computer network limited to a company or campus site
LED	light emitting diode

**M**

M	mega prefix for units of measurement with a factor of one million
MB	megabyte (unit of measurement for data volumes)

**O**

OCR	optical character recognition
-----	-------------------------------

**P**

PC	personal computer
----	-------------------

**R**

RAM	random access memory
RTC	real time clock board that keeps the current time in a device after switching off

**U**

USB	universal serial bus
-----	----------------------

**V**

V                   volt (physical unit of electrical potential)

**W**

W                   watt (physical unit of power)

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