



G+D
Currency Technology

Service Manual

BPS® C2



Original operating
instructions

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Note

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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® C2-4, release 2.1. The document is also valid for BPS C2-2, release 2.1 and BPS C2-3, release 2.1.

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 G "Technical Support", p. 209*

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1 About This Manual

This chapter contains the following information:

- Overview of all manuals in the BPS C2 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 C2 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 contains the following information about:

- BPS C2 Site and Facility Requirements
 - Requirements for the installation site, and for the transport and secure operation of the product
 - Technical details 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

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

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

Troubleshooting Manual

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 contains important safety information.
- In the → "General Information about the Product BPS C2" chapter, you will find an overview of the product.
- The → "BPS C2 Site and Facility Requirements" chapter contains the technical data for the product and describes the requirements that must be met at the installation site to safely operate the product.
- The → "Installation" chapter contains information on the transport, installation, and commissioning of the product.
- The → "Operation" chapter contains the following information:
 - Important terms
 - Operating controls
 - Operating unit and user interface
 - Default settings
 - Banknote processing operating procedures
 - System settings
 - System faults
 - Cleaning
- The → "Disposal" chapter provides you with all the information required for disposal.
- The → *Appendix* contains useful additional information. Examples:
 - Technical data
 - Description of reports

- A description of the criteria for fitness sorting
- Symbols used
- Contact addresses
- A list of abbreviations and glossary of terms
- 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.
Mechanical operating control	Names of mechanical operating controls like keys or switches are written in bold. Example: Press Start on the device.
GUI Text	Objects in the graphical user interface (GUI), e. g. a button, are in bold. Example: Click OK .
Menu option > Menu option	Menu names are in bold. Angle brackets indicate navigation through menus. Example: Select File > Print from the menu.
'User input'	User inputs are in single quotes. Example: Enter port = '8080' .
<Placeholder>	Placeholders for display text or user input are in angle brackets. Example: Enter <Password>.

Conventions	Definition
[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 <code>ping</code> .
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.
1. list entry 2. list entry	In numbered lists, make sure you follow the sequence of list entries.
<ul style="list-style-type: none"> ● list entry ● list entry 	In unnumbered lists, the sequence of list entries is not important.

Conventions	Definition
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 C2

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 cause damage to the product.

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

Proper Use

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

The processing of tickets is permitted.

Improper Use

Improper use, e.g. 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 will invalidate the EU Declaration of Conformity for the product.

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

Only genuine spare parts may be used for repair.

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 C2 Site and Facility Requirements" section of the system operating instructions are not fulfilled.

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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 Instructions to Protect Personnel

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 Operating Instructions.

Ensure that unauthorized personnel 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 C2 product does not increase the LED risk group or the risk to the operator.

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 Safety Information for Handling Non-Rechargeable Batteries

Risk of fire, explosion, or leakage of harmful substances if non-rechargeable batteries are not handled correctly.

- Do not recharge, force open, heat or burn the batteries.
- Make sure the polarity is correct.
- Only replace batteries with the same type of battery.
- Dispose of used batteries according to the manufacturer's instructions.

2.3.7 Instructions for Disposing of Batteries

Old batteries should not be put in the trash.

Dispose of old batteries in accordance with the applicable national (local) laws.

Make an active contribution to environmental protection. Return your old batteries to authorized collection points free of charge.

Batteries containing harmful substances are provided with the following symbol:



Figure 2: Symbol for Batteries Containing Hazardous Substances

The symbol includes the chemical name of the hazardous substance, e.g. Cd for cadmium, Pb for lead, and Hg for mercury.

2.3.8 Information on Special Dangers for the Operator

During operation of the product, please 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.

Ergonomics

Stand or sit in a comfortable manner. Arrange your workstation so that you can work ergonomically.

- Set your chair to the optimum position.
- Correct the height of the work surface for table-top machines if possible.
- Tilt the touch screen to the optimum position if possible.

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 operating instructions alerting you to high temperatures. These can cause severe burns (e.g. stepper motors).

Risk of crushing

- When closing flaps, drives, transport sections, etc., be careful that your hands or fingers are not crushed between any 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 damaged in this way. Always vacuum up any dust with a suitable vacuum device, fitted with a micro-filter.

2.3.9 Additional Safety Information for the Field Engineer

The maintenance and repair tasks are described in the service documentation in the System Operating Instructions.

Securing the Product Environment

If you are required to operate the product in an opened condition, ensure that no personnel 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

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. Extreme care must therefore be taken when removing or working on these units. You will find warnings on the risk of burns in the operating instructions.

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

Motion Sequence Testing

2

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.

If you are testing motion sequences (e.g. 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.

3 Assembly Overview of the BPS C2

The BPS C2 product family has three variants.

- BPS C2-4: Four delivery stackers
- BPS C2-3: Three delivery stackers
- BPS C2-2: Two delivery stackers

The BPS C2 product is divided into seven modules (shown for higher variant).

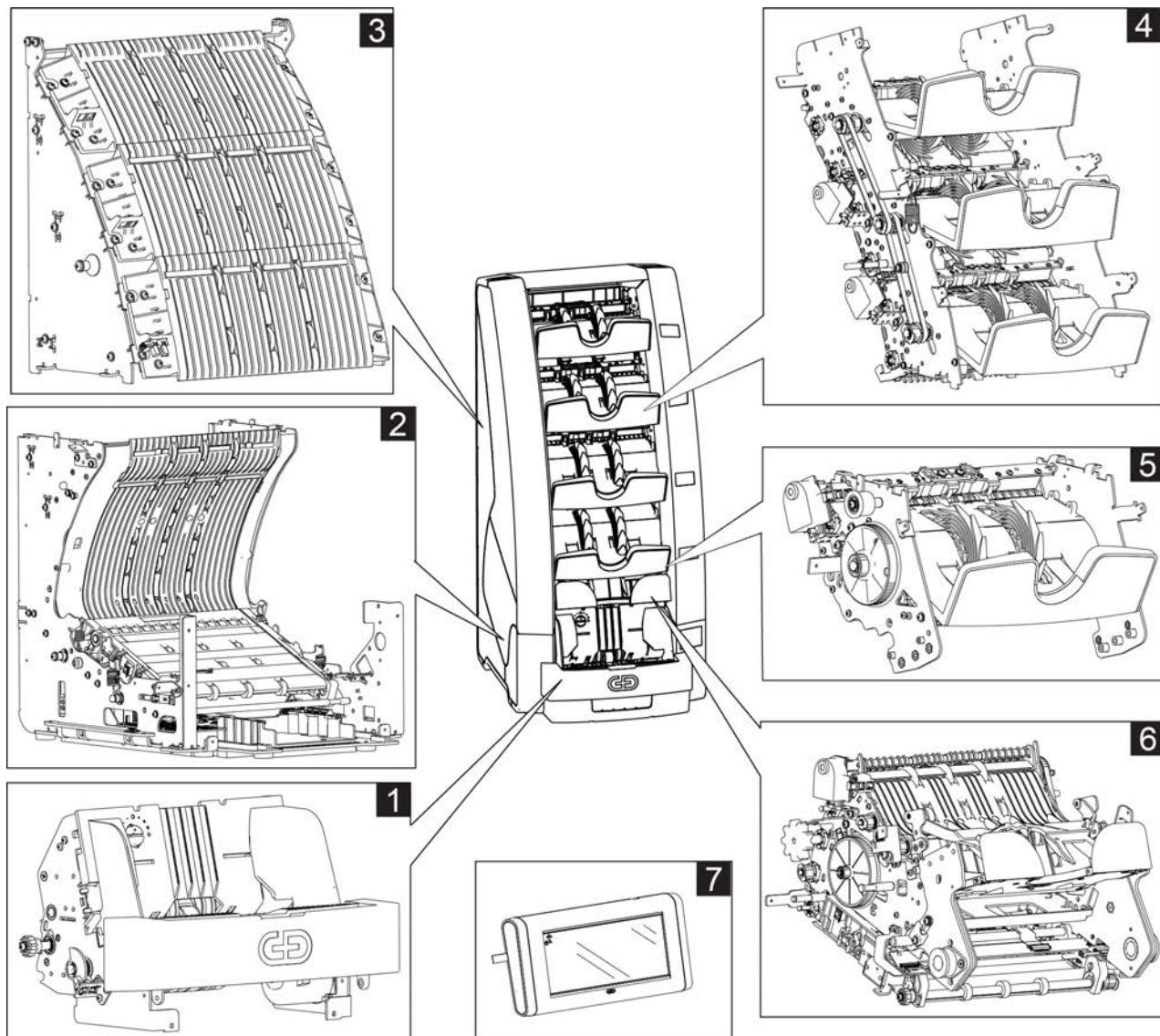


Figure 3: Assembly Overview

- 1 Singler
- 2 Base Module
- 3 Rear Module
- 4 Stacker Module

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- 5 Standard Stacker Module
- 6 Mid Module
- 7 Display Module

4 Type Label

The BPS C2 has the following type label:



Figure 4: Type Label

You will find the type label on the rear of the BPS C2.

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5 Sensors Overview

The BPS C2 has a sensor unit, divided into two halves.

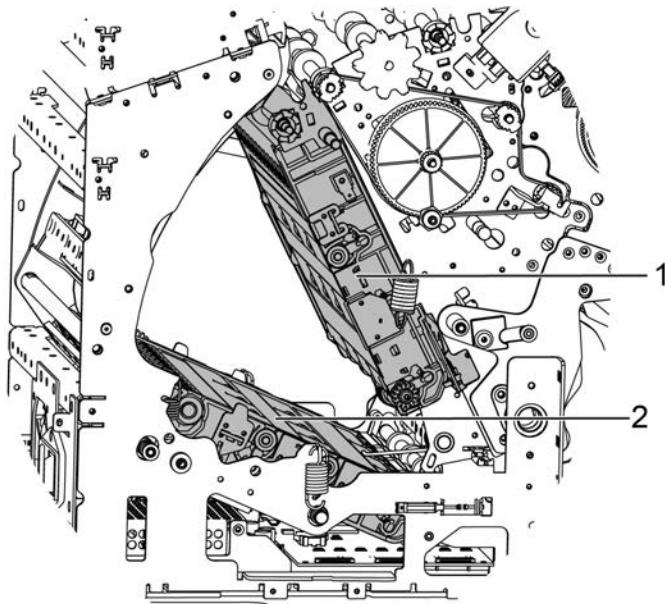


Figure 5: Sensor Housings Overview

1. Upper Sensor Housing: Located in the mid module.
2. Lower Sensor Housing: Located in the base module.

5.1 Upper Housing Sensors

5

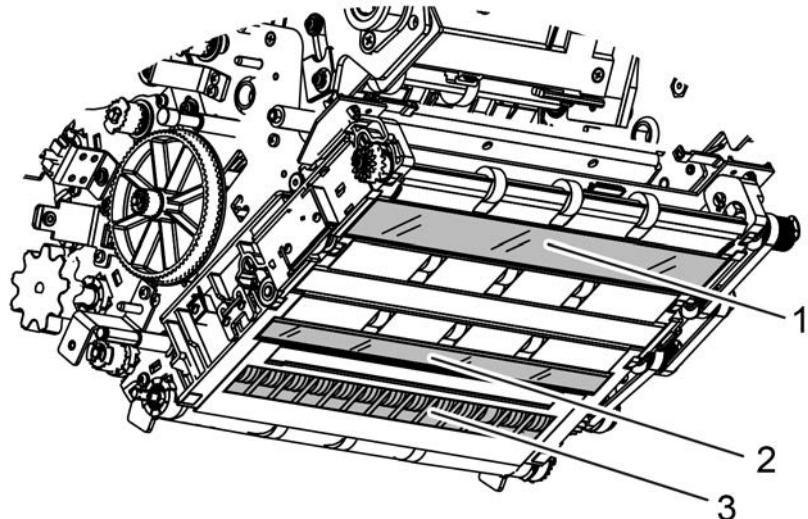


Figure 6: Upper Housing Sensors

- 1 PIS 2 (Primary Image Sensor) - Detects the banknote image, format, holes, tears, stains, soiled banknotes, dog ear, SNR
- 2 MAG (Magnetic) sensor - Detects the magnetic and security properties of the banknote
- 3 MTS (Mechanical Thickness Sensor) - Detects the banknote thickness (counterpart of MTS roller assembly, which is located in the lower sensor housing)

5.2 Lower Housing Sensors

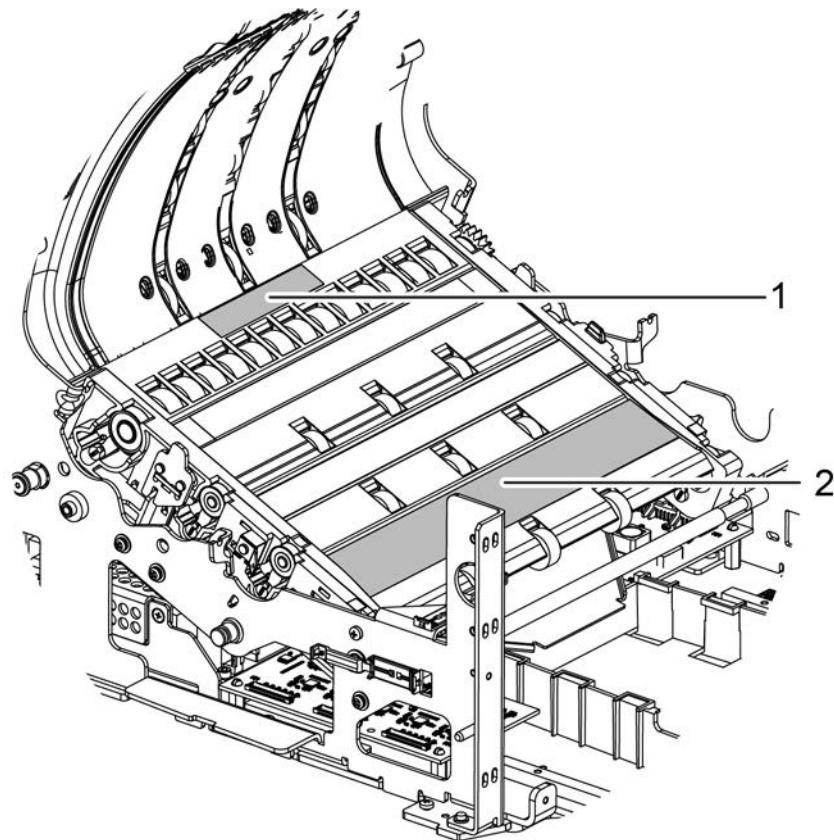


Figure 7: Lower Housing Sensors

- 1 UV (Ultra violet) sensor - Detects the ultraviolet properties
- 2 PIS 1 (Primary image sensor) - Detects the banknote image, format, holes, tears, stains, soiled banknotes, SNR.
PIS 1 and PIS 2 functions as one unit.

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6 Banknote Transport Path

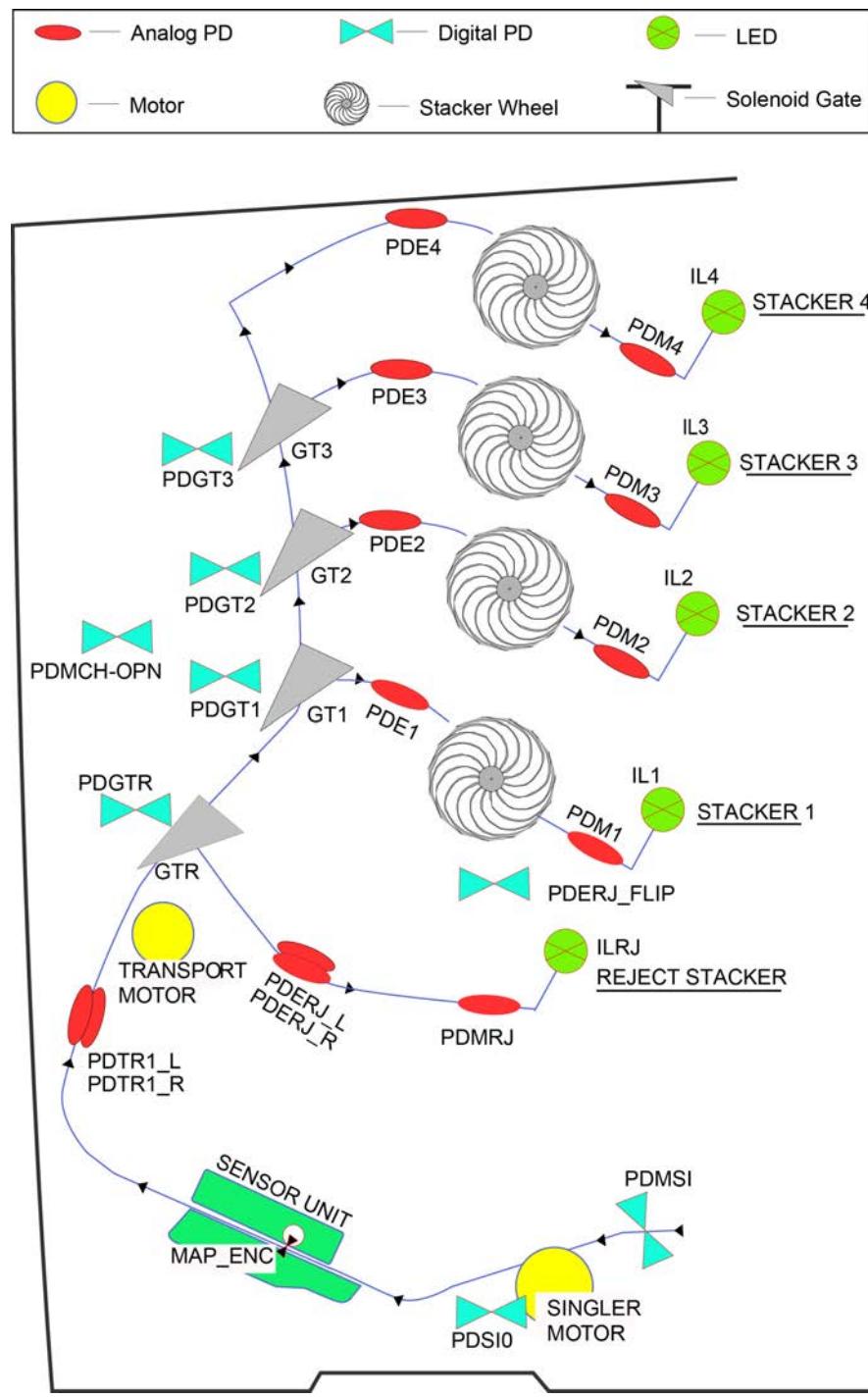


Figure 8: Banknote Transport Path

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7 Photo Detectors Overview

The BPS C2 has the following photo detectors.

SI No	Module	Technical Name	Description	Functionality
1	Singler Module	PDMS	Photo detector monitoring singler	To check the presence of banknotes on singler.
2	Singler Module	PDSI0	Photo detector home position	To check the singler home position and drum rotations.
3	Mid Module	PDGTR	Photo detector gate reject	To check the open/close status of reject diverter.
4	Standard Stacker Module	PDGT1	Photo detector gate stacker 1	To check the open/close status of stacker 1 diverter.
5	Stacker Module	PDGT2	Photo detector gate stacker 2	To check the open/close status of stacker 2 diverter.
6	Stacker Module	PDGT3	Photo detector gate stacker 3	To check the open/close status of stacker 3 diverter.
7	Rear Module	PDMCH_OPN	Photo detector machine open/close	To check the open/close status of machine.
8	Base Module	PDTR1_L	Photo detector transport 1- left	To check the banknotes transportation in transport.

SI No	Module	Technical Name	Description	Functionality
9	Base Module	PDTR1_R	Photo detector transport 1 - right	To check the banknotes transportation in transport.
10	Mid Module	PDERJ_FLIP	Photo detector reject flip	To check the 'FULL' position of banknotes in the reject stacker.
11	Standard Stacker Module	PDE1	Photo detector exit - stacker 1	To check the banknote transport into stacker 1.
12	Standard Stacker Module	PDM1	Photo detector monitoring - stacker 1	To check the presence of banknotes in stacker 1.
13	Stacker Module	PDE2	Photo detector exit - stacker 2	To check the banknote transport into stacker 2.
14	Stacker Module	PDM2	Photo detector monitoring - stacker 2	To check the presence of banknotes in stacker 2.
15	Stacker Module	PDE3	Photo detector exit - stacker 3	To check the banknote transport into stacker 3.
16	Stacker Module	PDM3	Photo detector monitoring - stacker 3	To check the presence of banknotes in stacker 3.
17	Stacker Module	PDE4	Photo detector exit - stacker 4	To check the banknote transport into stacker 4.

SI No	Module	Technical Name	Description	Functionality
18	Stacker Module	PDM4	Photo detector monitoring - stacker 4	To check the presence of banknotes in stacker 4.
19	Mid Module	PDMRJ	Photo detector monitoring reject	To check the presence of banknotes in reject stacker.
20	Mid Module	PDERJ_R	Photo detector exit reject - right	To check the banknote transport into reject stacker.
21	Mid Module	PDERJ_L	Photo detector exit reject - left	To check the banknote transport into reject stacker.

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8 Parts Replacement

This chapter describes how to replace the parts for service of the BPS C2.

In this chapter, you will find the following information:

- Tools
 - *Section 8.1 “Tools”, p. 31*
- Requirements for Parts Replacement
 - *Section 8.2 “Requirements for Parts Replacement”, p. 32*
- Removing the parts
- System Adjustment
 - *Section 8.16 “System Adjustment”, p. 112*

8.1 Tools

Hardware Tools

For the parts replacement, the following tools list is required.

Tool Specification

1. Phillips head screw driver.....PH2
2. Phillips head screw driver.....PH1
3. Torx screw driver.....T8
4. Torx screw driver.....T10
5. Allen key.....1.5 mm, 2.5 mm, 3:0 mm
6. Spring scale.....5 N
7. Flat screw driver.....1.5 mm
8. Long nose plier.....170 mm

8.1.1 Software Tools

Improved Recording Tool (IRT)

The IRT records the raw data of the banknotes processed in the BPS C2. Raw data that are recorded by IRT are used for creating or fine-tuning adaptation.

To install and run IRT, you must have a PC with:

- Microsoft Windows 7, 64 bit operating system
- Admin rights
- Microsoft .NET Framework installed separately

IRT is contained in a single setup file. Run the setup file to install IRT. It is recommended to install into the proposed path (Microsoft Windows default application path).

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BPS Eco-Configurator

The BPS Eco-Configurator is a comprehensive and interactive tool for configuring the following features of the BPS C2.

- Add, update, or remove currency adaptation packages
- Create and configure operating modes
- Configure thresholds
- Group reject reasons
- Configure customer-specific settings for reports

For more information on The BPS Eco-Configurator, refer to the BPS Eco-Configurator User Manual.

Calfilebuilder

The Calfilebuilder tool is used to generate the MTS Calibration (.ca) file. Calfilebuilder converts the raw data (.nif file) of the MTS calibration documents to the .ca file, which is required to calibrate the MTS sensor of the BPS C2.

The Calfilebuilder tool is contained in a single setup file. Save the setup file in the proposed location and run the *Project5.exe* file to start the Calfilebuilder tool.

8.2 Requirements for Parts Replacement

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

The following requirements 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.


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.

If you do not use an anti-static band, you should "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.


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.

Ergonomics

Stand or sit in a comfortable manner. Make the appropriate adjustments for your work area.

**Non-specified materials
Sharp edges**

Additional dangers may result from the use of non-specified materials such as cleaning agents, sprays, lubricants, etc.

Special care is required when cleaning or checking parts with sharp edges.

Dust

Never use compressed air to clean the banknote processing machine. Breathing in dust can lead to health problems. Furthermore, the whirling dust may also cause damage to the bearings and electronic parts. No claims can be made under the guarantee

for parts damaged in this way. Therefore, vacuum any dust with a suitable vacuum device, fitted with a micro-filter.

8.2.1 Switching the BPS C2 ON/OFF

The BPS C2 has a power switch (1) at the rear and a soft power button (2) at the front.

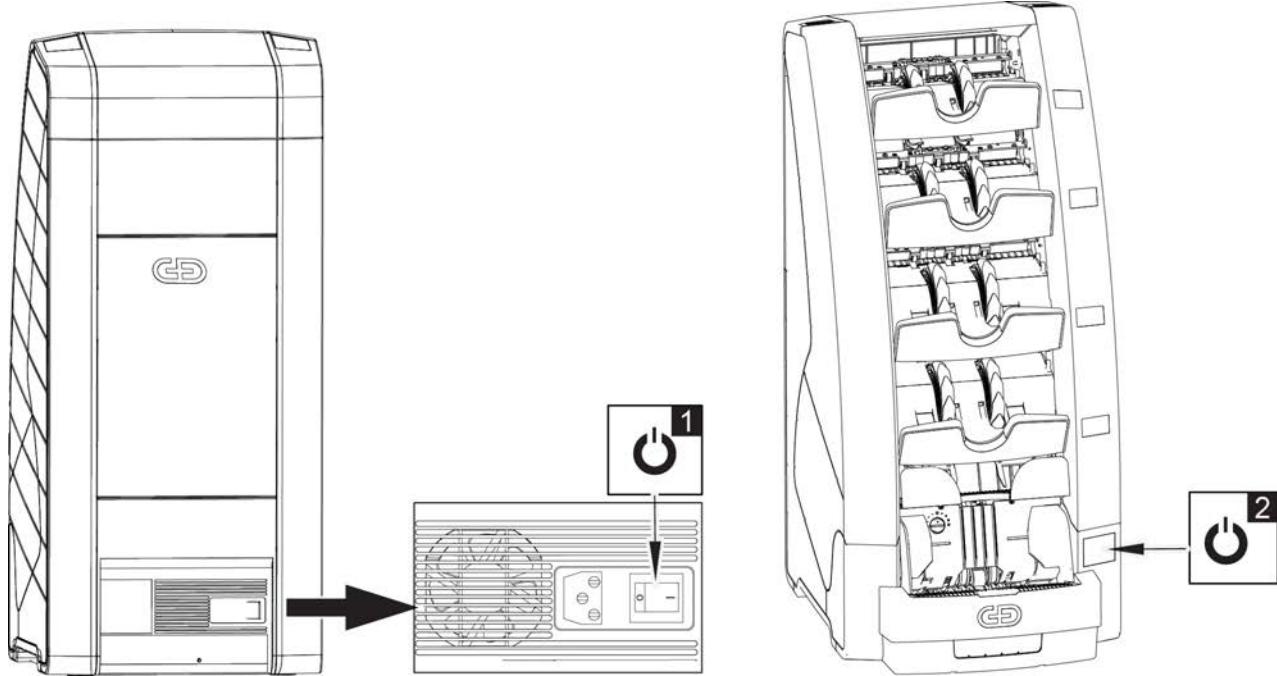


Figure 9: BPS C2 ON/OFF

1. Power Switch
2. Power Button

Switching ON

[1] Switch on the power switch (1).

[2] Press the power button (2).

Result

⇒ The BPS C2 is switched ON, the login screen is displayed.

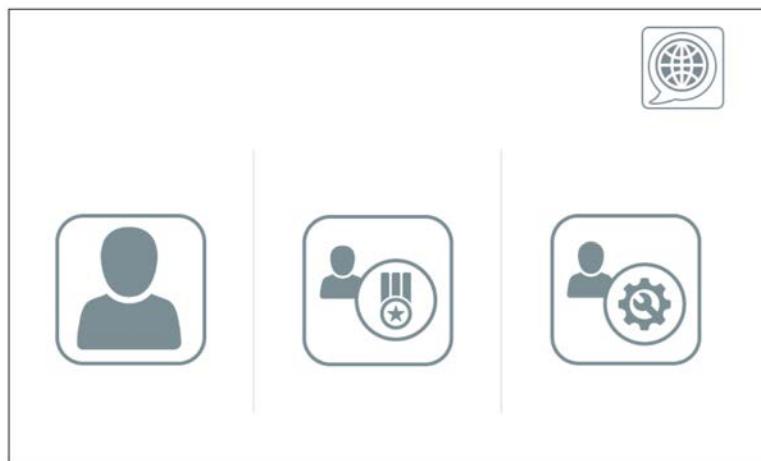


Figure 10: Login Screen

Switching OFF



Important!

All unsaved results will be deleted when the BPS C2 is switched off.

[1] Press the power button (2).

⇒ The power button starts blinking.

[2] Switch off the power switch (1).

Result ⇒ The BPS C2 is switched OFF.

8.2.2 Opening and Closing the BPS C2

For cleaning or in case of malfunctions, you need to open the BPS C2.

8.2.2.1 Opening the BPS C2

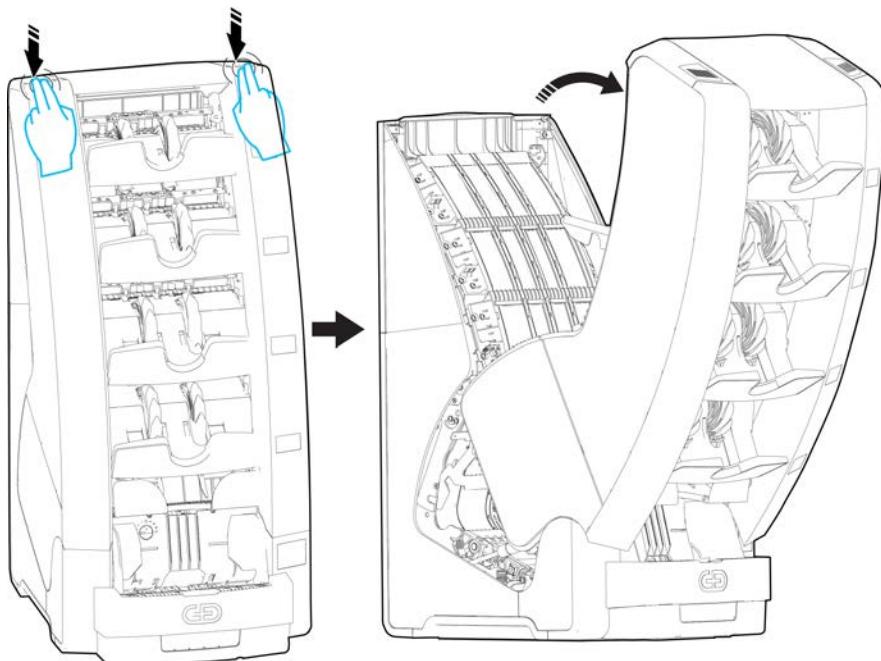


Figure 11: BPS C2 Open

Procedure

- [1] Simultaneously, press the buttons and pull the front module forward.

Result ⇒ The BPS C2 is open.

8

8.2.2.2 Opening the Reject Path

Requirements

- The BPS C2 is opened.
→ *Section 8.2.2.1 "Opening the BPS C2", p. 36*

Procedure

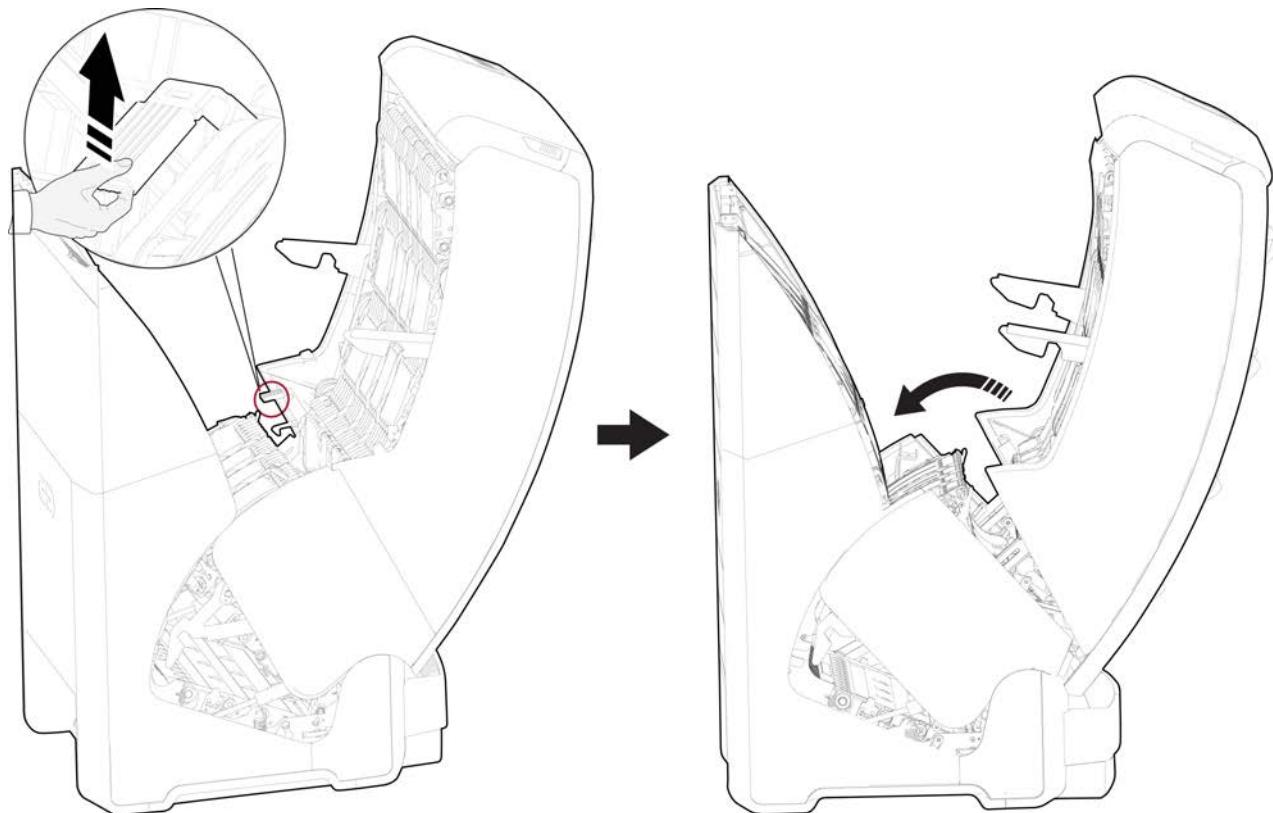


Figure 12: Reject Path Open

8

- [1] Pull the latch upwards.
 Result ⇒ The reject path is open.

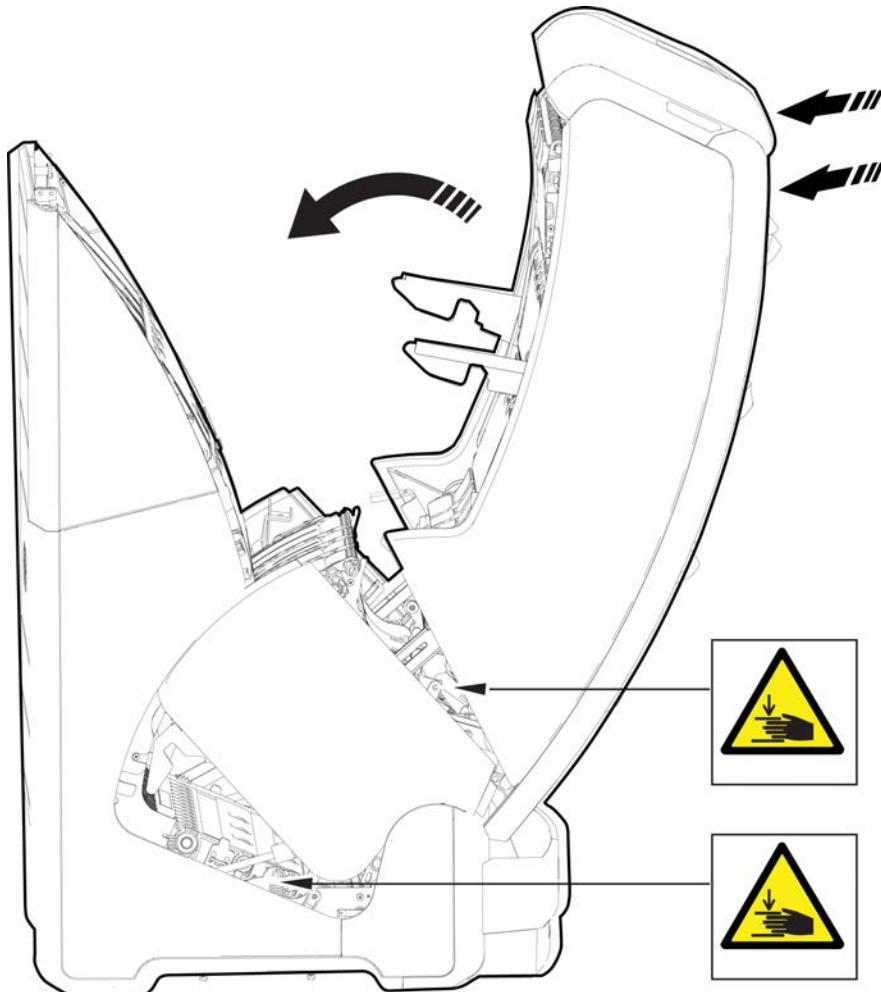
8.2.2.3 Closing the BPS C2



CAUTION

There is a risk of crushing when closing the BPS C2.
 You may trap your fingers.
 When closing, be careful not to crush your fingers.

Procedure



[1] Push the front module back.

**Important!**

Ensure that the front module engages properly not until you hear the latch click sound.

Result

- ⇒ The reject path is closed by the above step.
The BPS C2 is closed when you hear a click sound.

8.3 Removing the Covers

For parts replacement or to perform adjustment procedures, the BPS C2 covers are removed. Follow the same removal procedure on RHS covers.

8.3.1 Covers Overview

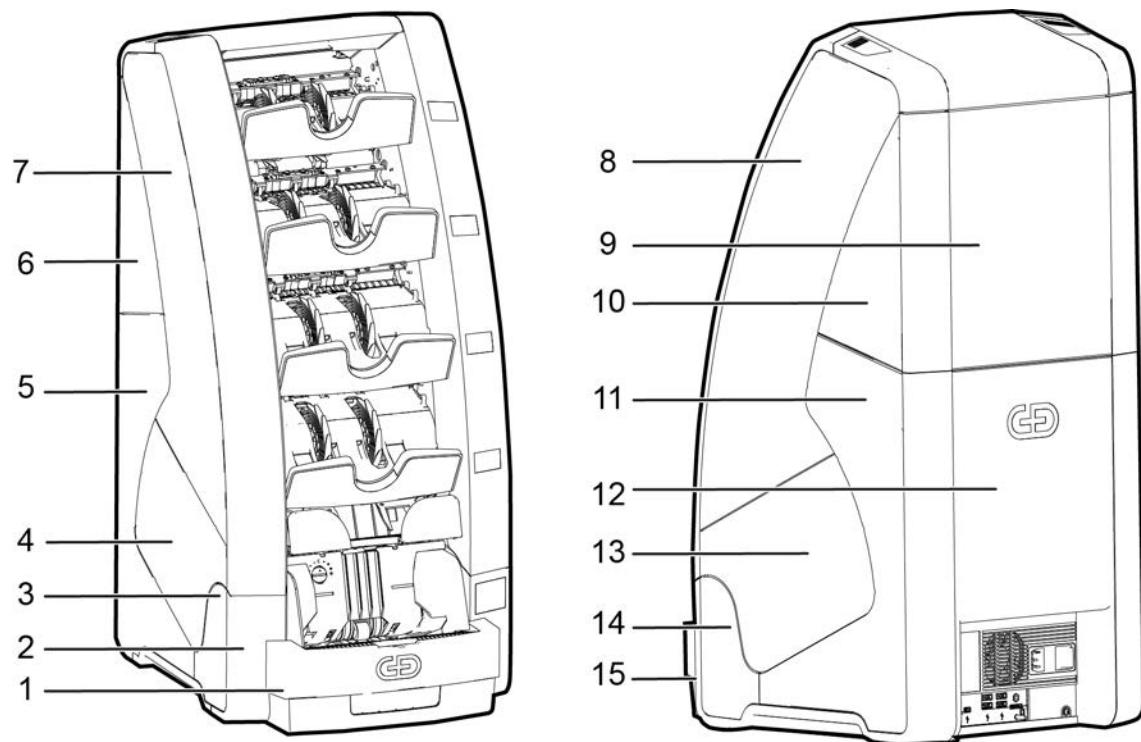


Figure 13: BPS C2 Covers

Item No	Name
1	Singler Cover
2	Side Singler Frame (LHS)
3	Front Base Cover (LHS)
4	Mid Cover (LHS)
5	Base Cover (LHS)
6	Rear Cover (LHS)
7	Side Cover (LHS)
8	Side Cover (RHS)
9	Upper Rear Cover
10	Rear Cover (RHS)

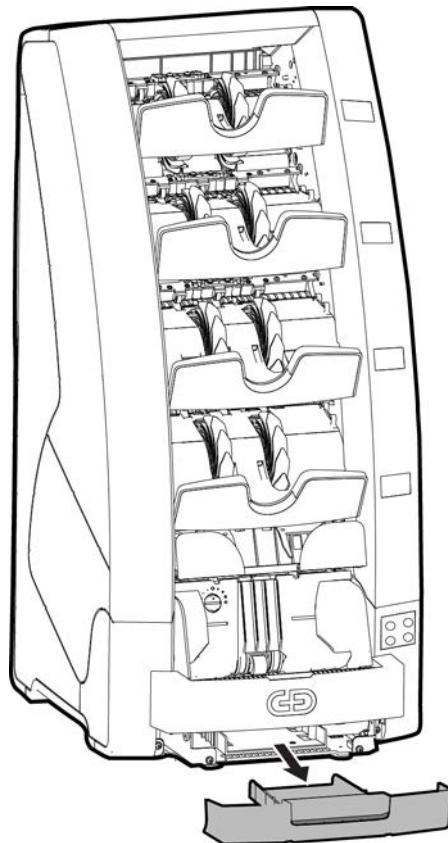
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Item No	Name
11	Base Cover (RHS)
12	Lower Rear Cover
13	Mid Cover (RHS)
14	Front Base Cover (RHS)
15	Side Singler Frame (RHS)

8.3.2 Removing the Dust Tray

This procedure shows how to remove the dust tray.

Procedure



- [1] Pull and remove the dust tray.

Result ⇒ The dust tray is removed.

8.3.3 Removing the Singler Cover

Requirements

- The BPS C2 is switched OFF.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The dust tray is removed.
→ *Section 8.3.2 “Removing the Dust Tray”, p. 40*

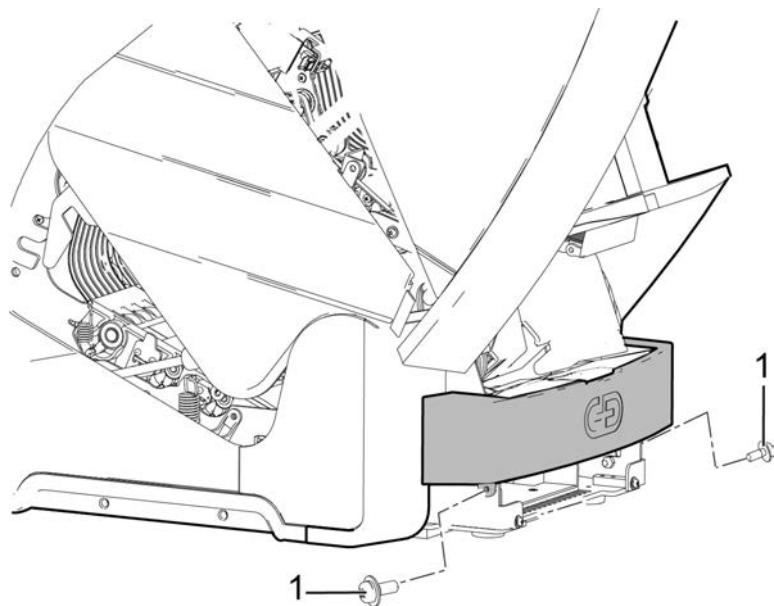


Figure 14: Singler Cover Removal

Result

- [1] Remove the screws (1) on both sides.
 - [2] Remove the singler cover.
- ⇒ The singler cover is removed.

8.3.4 Removing the Side Cover (LHS/RHS)

Requirements

- The BPS C2 is switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The BPS C2 is opened.
→ *Section 8.2.2.1 “Opening the BPS C2”, p. 36*

Procedure

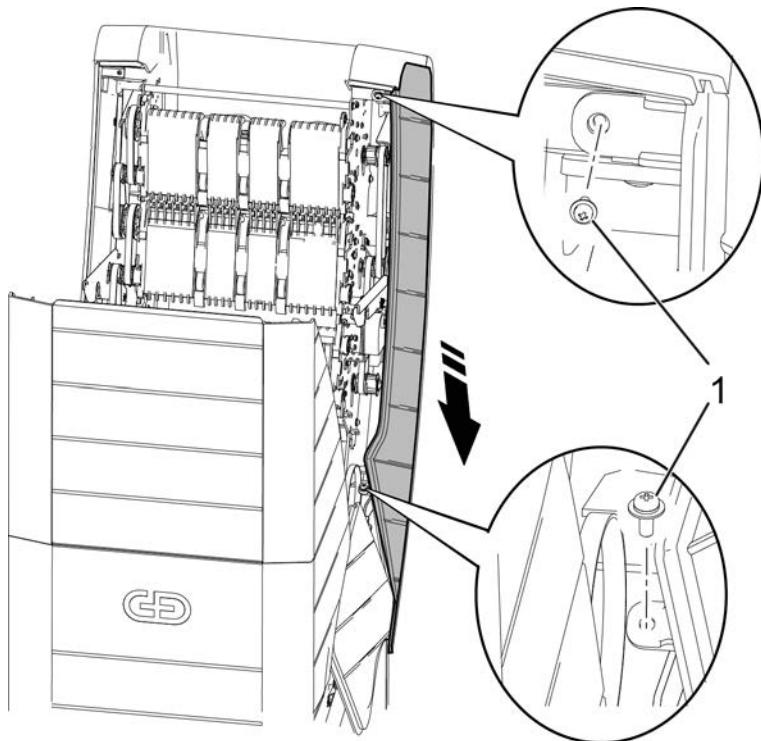


Figure 15: Side Cover Removal (LHS/RHS)

- [1] Remove the screws (1).
- [2] Slide the cover downwards and remove it from the BPS C2.

Result ⇒ The side cover (LHS/RHS) is removed.

8.3.5 Removing the Rear Cover (LHS/RHS)

Requirements

- The BPS C2 is switched OFF.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The BPS C2 is opened.
→ *Section 8.2.2.1 “Opening the BPS C2”, p. 36*

Procedure

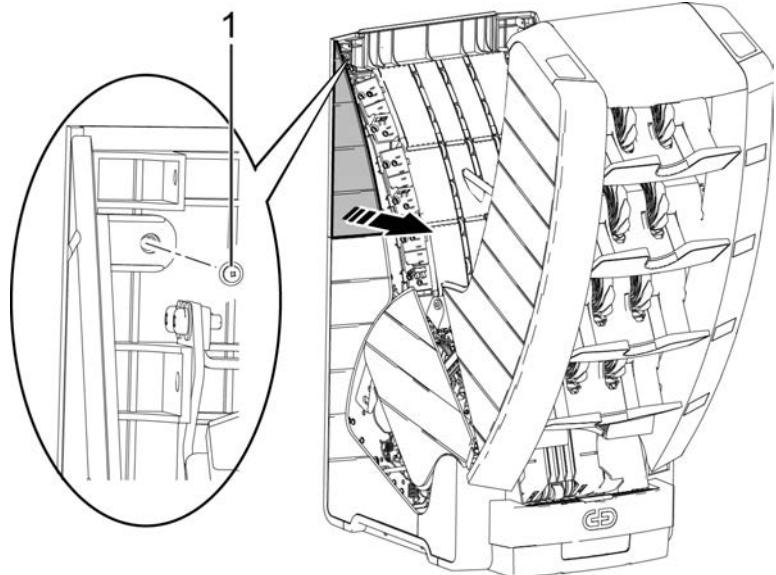


Figure 16: Rear Cover (LHS/RHS) Removal

[1] Remove the screw (1).



Important!

There is a locking arrangement between the rear cover and base cover from inside. Ensure that the covers are unlocked while removing.

[2] Slide out and then remove the rear cover.

Result

⇒ The rear cover (LHS/RHS) removed.

8

8.3.6 Removing the Base Cover (LHS/RHS)

Requirements

- The rear cover (LSH/RHS) is removed.

→ Section 8.3.6 “Removing the Base Cover (LHS/RHS)”, p. 43

Procedure

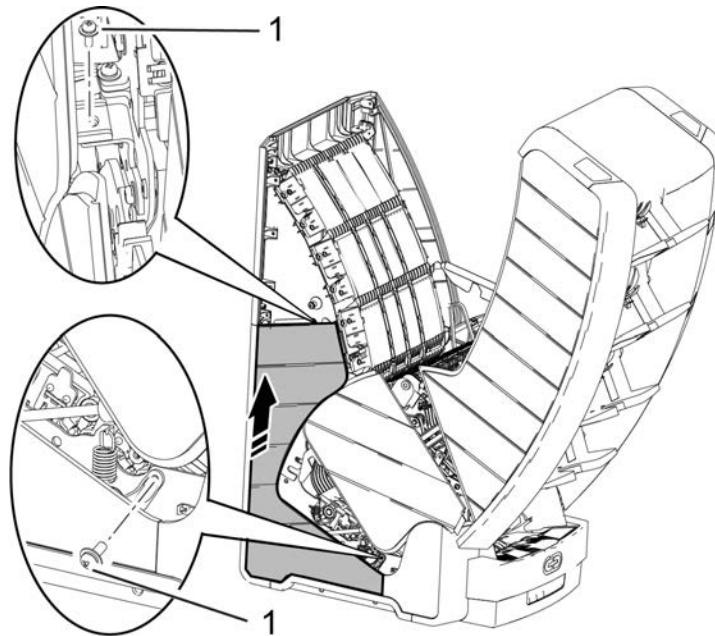


Figure 17: Base Cover (LHS/RHS) Removal

Result

- [1] Remove the screws (1).
 - [2] Slide the cover upwards and remove it from the BPS C2.
- ⇒ The base cover (LHS/RHS) is removed.

8

8.3.7 Removing the Mid Cover (LHS/RHS)

Requirements

- The base cover (LHS/RHS) is removed.
→ *Section 8.3.6 “Removing the Base Cover (LHS/RHS)”, p. 43*

Procedure

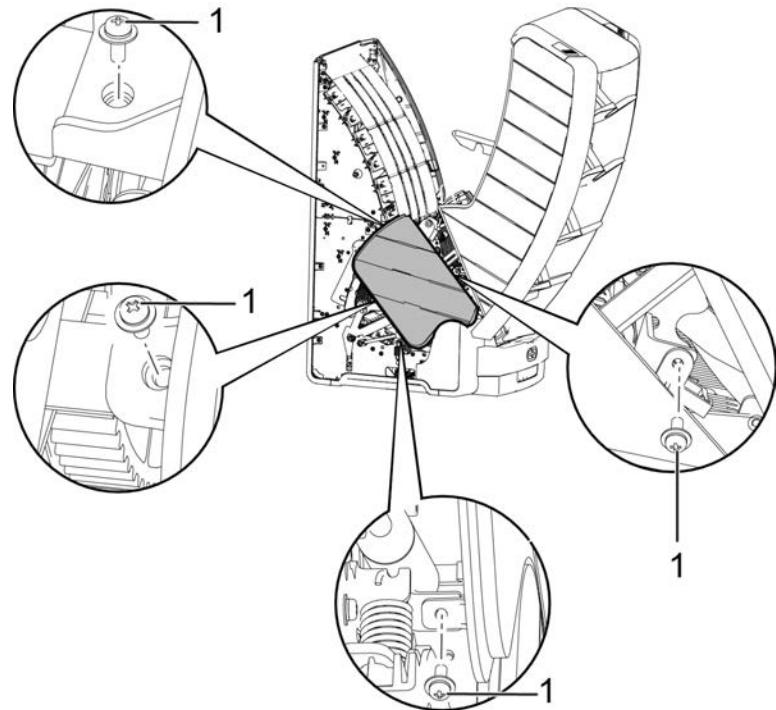


Figure 18: Mid Cover Removal (LHS/RHS)

- [1]** Remove the screws (1) and then remove the cover from the BPS C2.

Result

- ⇒ The mid cover (LHS/RHS) is removed.

8

8.3.8 Removing the Front Base Cover (LHS/RHS)

Requirements

- The mid cover (LHS/RHS) is removed.
→ *Section 8.3.7 “Removing the Mid Cover (LHS/RHS)”, p. 44*

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Procedure

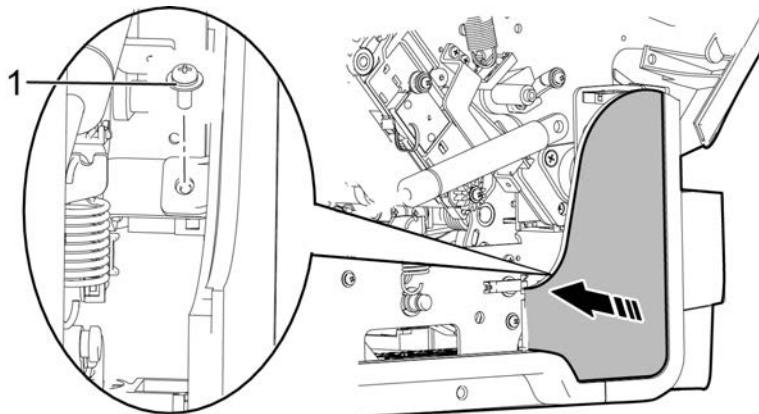


Figure 19: Front Base Cover (LHS/RHS) Removal

- [1] Remove the screw (1).
- [2] Slide and remove the cover from the BPS C2.

Result ⇒ The front base cover (LHS/RHS) is removed.

8.3.9 Removing the Side Singler Frame (LHS/RHS)

Requirements

- The singler cover is removed.
→ *Section 8.3.3 “Removing the Singler Cover”, p. 41*
- The front base cover (LHS/RHS) is removed.
→ *Section 8.3.8 “Removing the Front Base Cover (LHS/RHS)”, p. 45*

Procedure

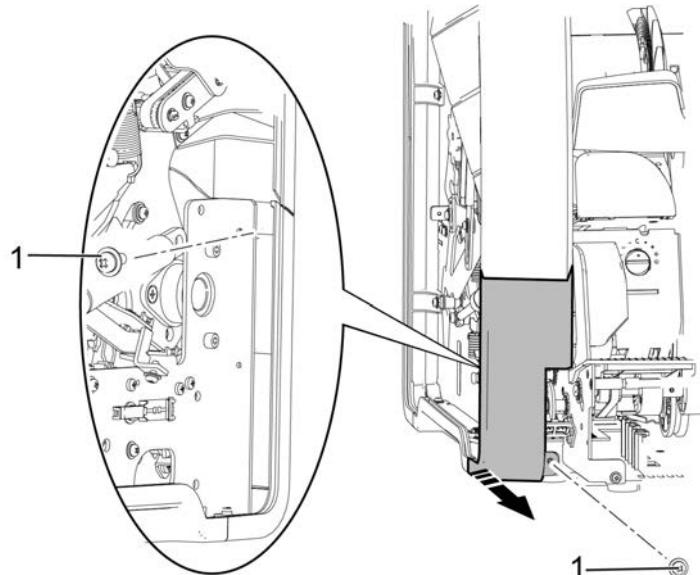
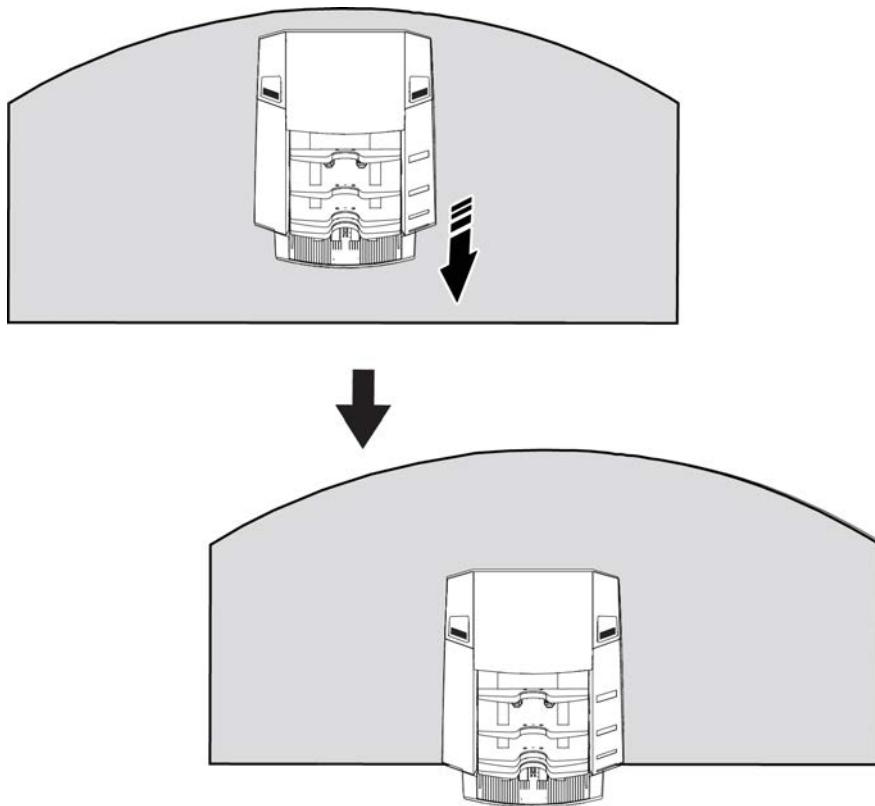


Figure 20: Side Singler Frame (LHS/RHS) Removal

- [1] Remove the screw (1).

**Important!**

Move the BPS C2 forward to open up the space below the side frame.



[2] Slide and remove the cover from the BPS C2.

Result ⇒ The side singler frame (LHS/RHS) is removed.

8.3.10 Removing the Upper Rear Cover

Requirements

- The BPS C2 is switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The BPS C2 is open.
→ *Section 8.2.2.1 “Opening the BPS C2”, p. 36*

Procedure

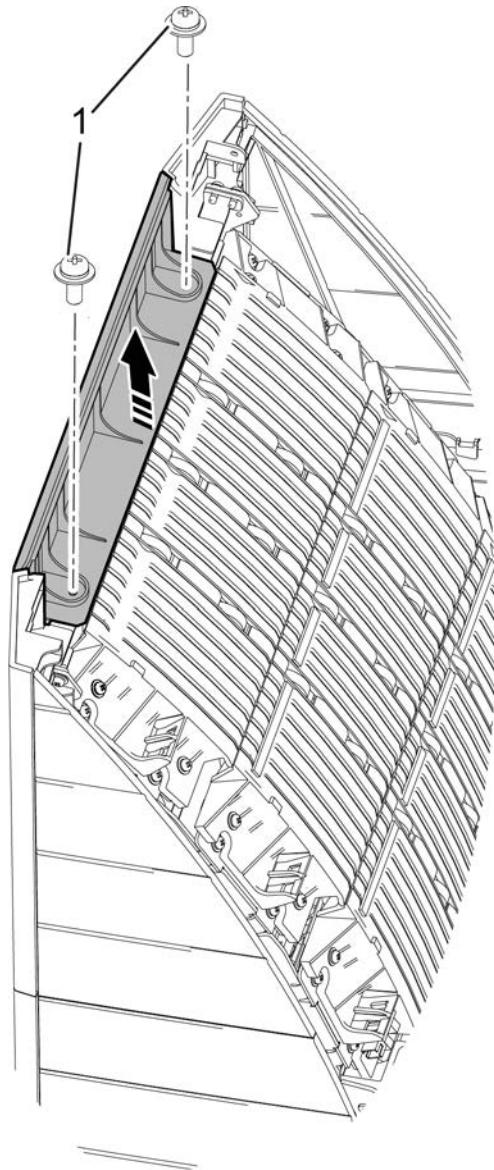


Figure 21: Upper Rear Cover Removal

- [1] Remove the screws (1).
- [2] Slide the cover upwards and then it from the BPS C2.

Result

⇒ The upper rear cover is removed.

8.3.11 Removing the Lower Rear Cover

Requirements

- The upper rear cover is removed.
→ *Section 8.3.10 “Removing the Upper Rear Cover”, p. 48*
- Unplug the power chord, LAN and accessory cables from the USB ports.

Procedure

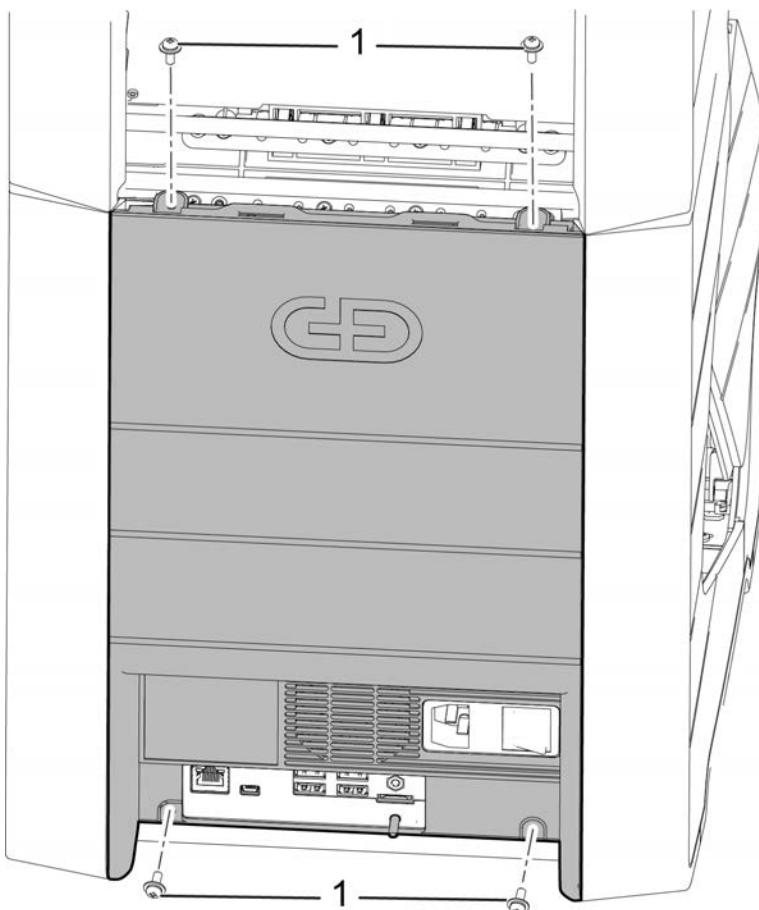


Figure 22: Lower Rear Cover Removal

- [1] Remove the screws (1).
- [2] Slide and then remove the cover.

Result

⇒ The lower rear cover is removed.

8.4 Replacing Parts in the Singler Module

The singler module is a sub-system of BPS C2. The singler module of BPS C2 is of the friction type and functions to single out

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unbundled banknotes stacked in the singler area. The banknotes are further processed in various stages and sent to the relevant stacker.

The singler module consists of the following main parts/sub-systems.

- Singler drum assembly
- Hopper wheels assembly
- Retarding wheel assembly
- Feeder plate assembly
- Singler motor

The singler module is removed/replaced when:

- The spare parts in the singler module needs replacement.
- The singler needs adjustments.

This chapter contains the following information on replacing parts in various modules of BPS C2:

- → *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34.*
- → *Section 8.4.1 “Removing the Singler Module”, p. 52.*
- → *Section 8.4.2 “Replacing the Feeder Plate Assembly”, p. 52.*
- → *Section 8.4.3 “Replacing the Singler Drum Assembly”, p. 54.*
- → *Section 8.4.4 “Replacing the Hopper Wheels Assembly”, p. 58.*
- → *Section 8.4.5 “Replacing the Retarding Wheels Assembly”, p. 60.*
- → *Section 8.4.6 “Removing the Guide Roller Assembly (1R 16MM)”, p. 61.*
- → *Section 8.4.8 “Replacing the Spur Gear Assembly (14T W6)”, p. 64.*
- → *Section 8.4.9 “Replacing the Singler Motor”, p. 65.*

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

Requirements

The following requirements must be satisfied for all works.

- The BPS C2 switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34.*
- Power plug is removed from the socket and secure it so that it cannot be switched on again.

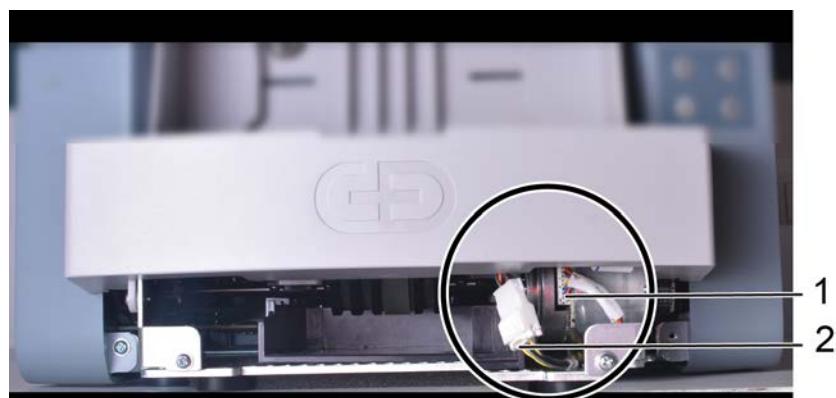
8.4.1 Removing the Singler Module

This procedure shows how to remove the singler module from the BPS C2.

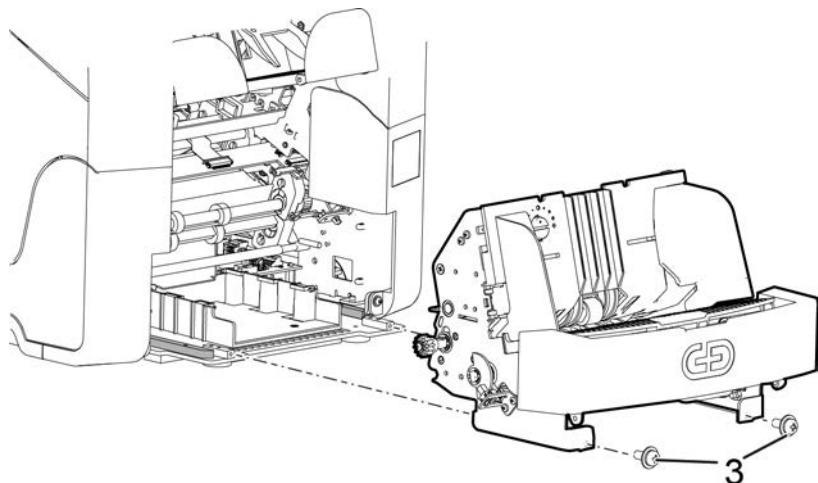
Requirements

- The BPS C2 is switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The dust tray is removed.
→ *Section 8.3.2 “Removing the Dust Tray”, p. 40*

Procedure



- [1] Unplug the motor connector (1) and the PD connector (2).



- [2] Remove the two screws (3).

- [3] Slide and remove the singler module.

Result

- ⇒ The singler module is removed.

8.4.2 Replacing the Feeder Plate Assembly

This procedure shows how to replace the feeder plate assembly.

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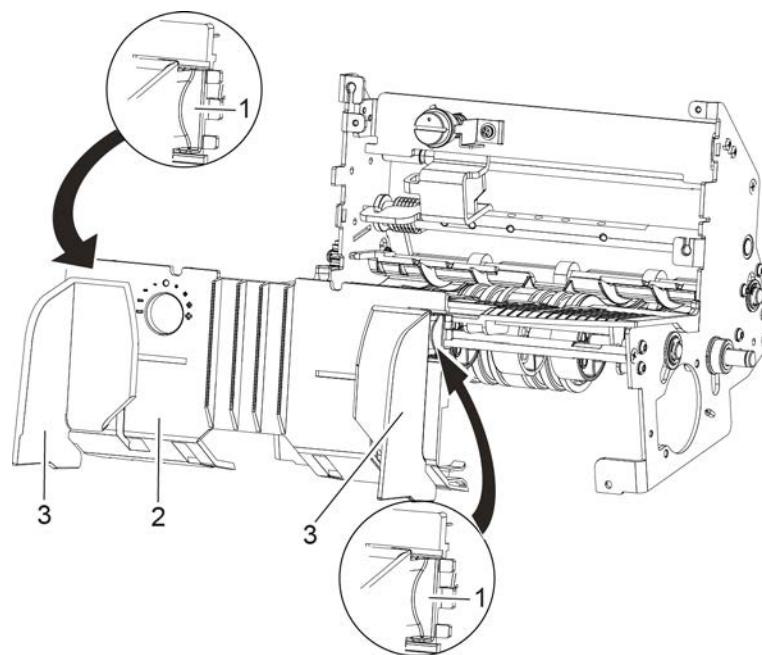


Figure 23: Removing the Feeder Plate Assembly

- [1] Slide the guide flaps (3) inward.
 - [2] Press the two locks (1) fully inward by your finger.
 - [3] Remove the feeder plate assembly (2).
- ⇒ The feeder plate assembly is removed.

Mounting the Feeder Plate Assembly

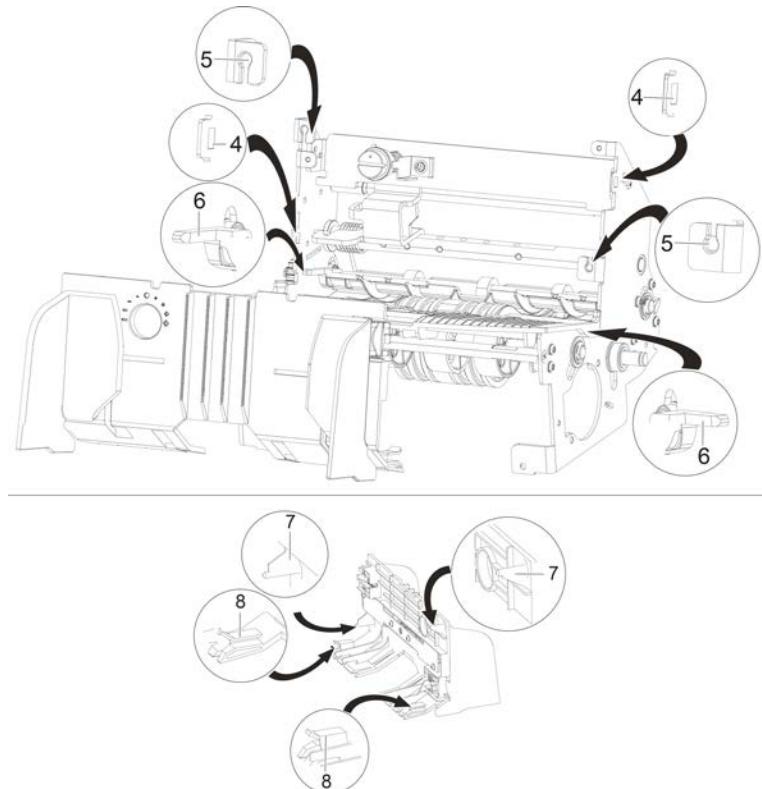


Figure 24: Mounting the Feeder Plate Assembly

- [1] Hold the assembly by the two flaps (3) and press the two locks (1) fully inward.
 - [2] Mount the feeder plate assembly (2) onto singler area.
Feeder plate assembly can be mounted by:
 - Locating the two locating pins (4) into the two slots (5).
 - Guiding the two guiding pins (6) into the two guiding pockets (7).
 - [3] Press the feeder plate assembly (2) until the two locks (1) are secured in the two square holes (8).
- Result ⇒ The feeder plate assembly is mounted.

8.4.3 Replacing the Singler Drum Assembly

This procedure shows how to replace the singler drum assembly.

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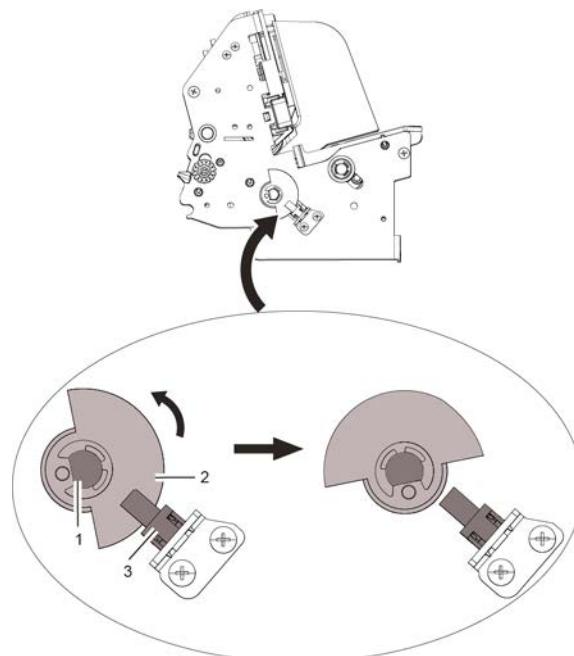


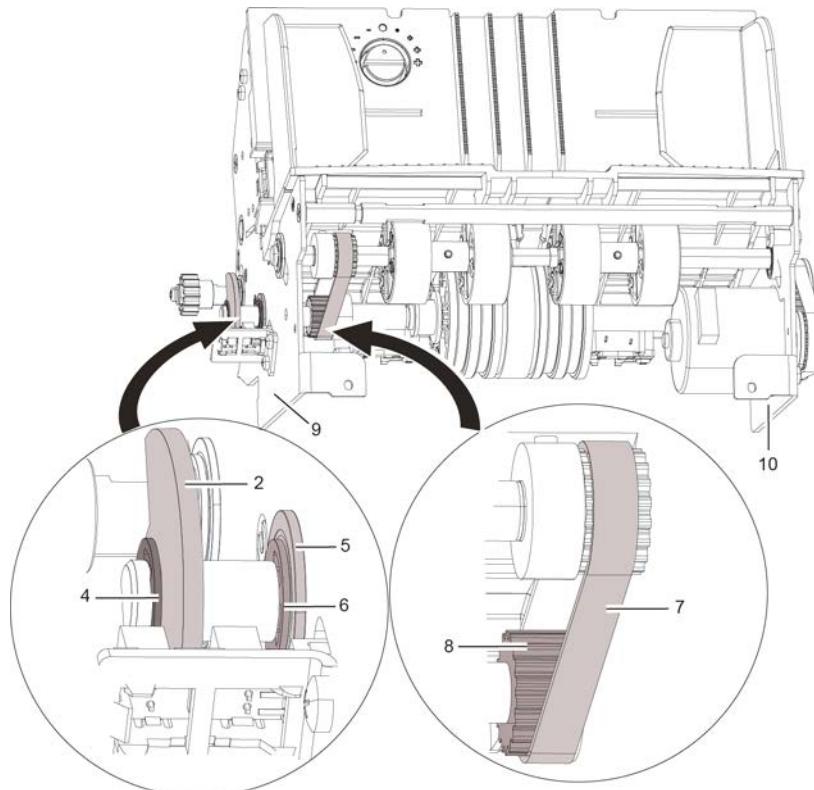
Figure 25: Removing the Singler Drum Assembly

Requirements

- Singler module is removed from BPS C2.
 → *Section 8.4.1 “Removing the Singler Module”, p. 52*

Procedure

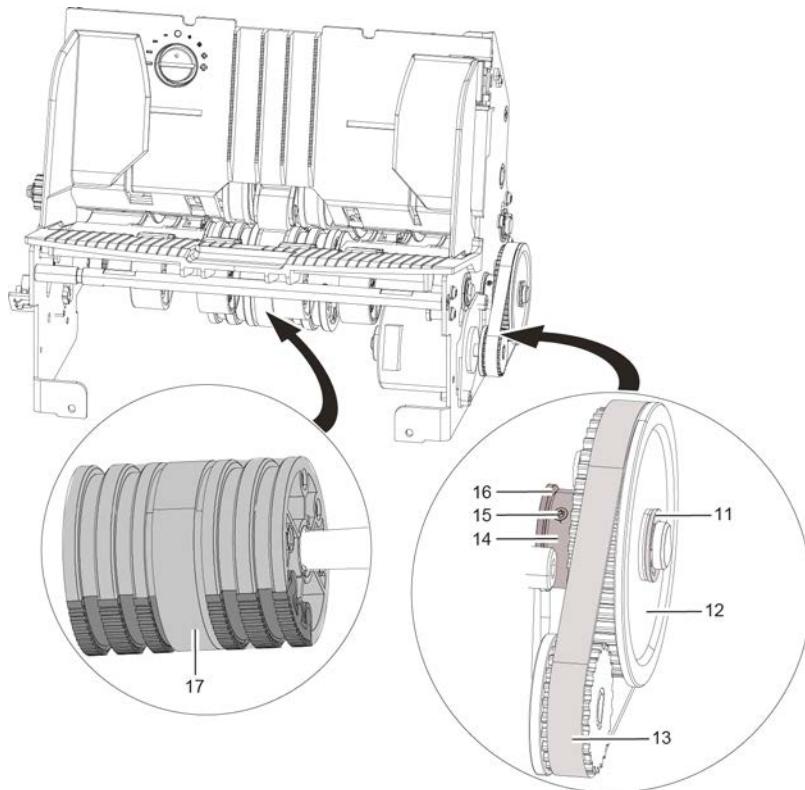
- [1]** Rotate the singler shaft (1) so that the position of the sensor flag (2) is away from the photo detector (3).



- 8**
- [2] Remove the circlip (4).
 - [3] Remove the sensor flag (2).
 - [4] Remove the circlip (6).
 - [5] Dismount the timing belt (7) from the timing pulley (8).


Important!

As the timing belt (7) is also mounted on the timing pulley of the hopper wheels assembly, it cannot be dismounted completely.



8

- [6] Remove the circlip (11).
- [7] Remove the timing pulley (12) along with the timing belt (13).
- [8] Loosen the grub screw (15).
- [9] Remove the bearing lock (14).
- [10] Remove the bearings (5) & (16).
- [11] Hold the singler drum (17) and then remove the singler drum assembly from the singler area.

Result

⇒ The singler drum assembly is removed.

Mounting the Singler Drum Assembly

- [1] Insert the singler drum assembly through the timing belt (7).
- [2] Locate the two ends of the singler shaft (1) into its bearing mounting holes.

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- [3]** Mount the bearings (5) & (16) onto the both sides of singler shaft (1) with press fit.



Important!

Make sure that the inner surface of the bearings (5) & (16) touches the side plate (9) and (10) of the singler assembly.

- [4]** Mount the circlip (6).

- [5]** Mount the sensor flag (2).



Important!

Make sure that the position of sensor flag (2) is away from PD (3).

- [6]** Mount the circlip (4).

- [7]** Mount the timing belt (7) onto the timing pulley (8).

- [8]** Mount the bearing lock (14).

- [9]** Tighten the grub screw (15).



Important!

Make sure that there is no play in the singler drum assembly after the bearing lock is tightened.

- [10]** Mount the timing pulley (12) onto the singler shaft (1).

- [11]** Mount the timing belt (13) onto the timing pulley (12).

- [12]** Mount the circlip (11).

Result

⇒ The singler drum assembly is mounted.

8.4.4 Replacing the Hopper Wheels Assembly

This procedure shows how to replace the hopper wheels assembly.

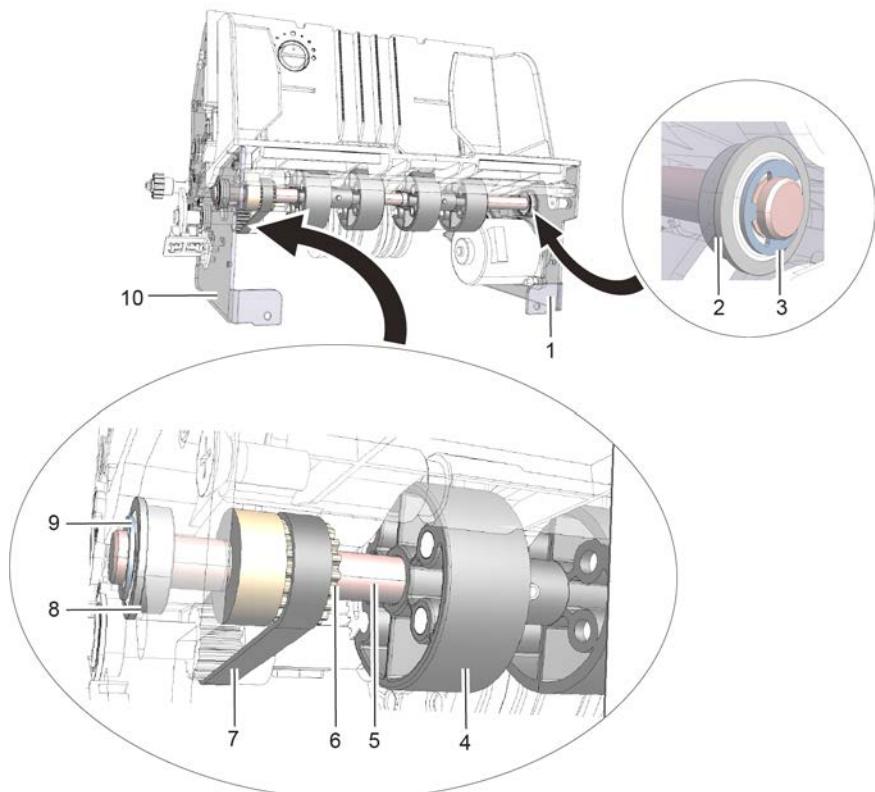


Figure 26: Removing the Hopper Wheels Assembly

Requirements

- Singler module is removed from BPS C2.
→ *Section 8.4.1 “Removing the Singler Module”, p. 52*

Procedure

- [1] Remove the circlips (9) & (3).
- [2] Remove the bearing (8) & (2).
- [3] Dismount the timing belt (7) from the timing pulley (6).



Important!

As the timing belt (7) is also mounted on the timing pulley of the singler drum assembly, it cannot be dismounted completely.

- [4] Remove the hopper wheels assembly (4) from the singler area.

Result

⇒ The hopper wheels assembly is removed.

Mounting the Hopper Wheels Assembly

- [1] Insert the hopper wheels assembly through the timing belt (7).

[2] Locate the two ends of the hopper wheels assembly shaft (5) into its bearing mounting holes.

[3] Mount the bearing (2) onto the hopper wheels assembly shaft (5) with press fit.



Important!

Make sure that the inner surface of the bearing (2) touches the side plate (1) of the singler assembly.

[4] Mount the circlip (3).

[5] Mount the timing belt (7) onto the timing pulley (6).

[6] Mount the bearing (8) onto the hopper wheels assembly shaft (5) with press fit.



Important!

Make sure that the inner surface of the bearing (8) touches the side plate (10) of the singler assembly.

[7] Mount the circlip (9).

Result

⇒ The hopper wheels assembly is mounted.

8

8.4.5 Replacing the Retarding Wheels Assembly

This procedure shows how to replace the retarding wheels assembly.

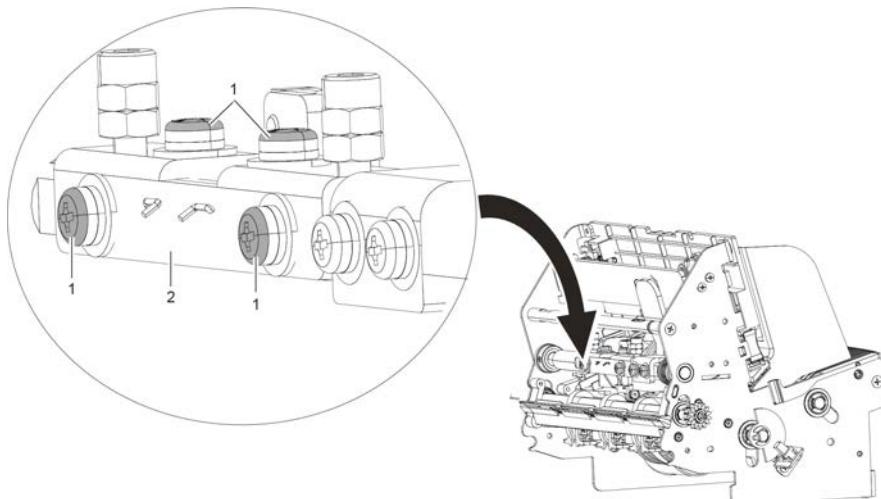


Figure 27: Removing the Retarding Wheels Assembly

Requirements

- Singler module is removed from BPS C2.
→ *Section 8.4.1 "Removing the Singler Module", p. 52.*
- Feeder plate assembly is dismounted.
→ *Section 8.4.2 "Replacing the Feeder Plate Assembly", p. 52.*

Procedure

- [1] Remove the four screws (1).
- [2] Remove the retarding wheels assembly (2).

Result

⇒ The retarding wheels assembly is removed.

Mounting the Retarding Wheels Assembly

**Important!**

Make sure that the hexagonal locknut is loosened so that the thread of the bolt is below the frame surface.

- [1] Mount the retarding wheels assembly (2).
- [2] Fasten the four screws (1).
- [3] Mount the feeder plate assembly.
→ *Section 8.4.2 "Replacing the Feeder Plate Assembly", p. 52.*

Result

⇒ The retarding wheels assembly is mounted.

After the retarding wheels assembly is mounted, adjust the singler.

→ *Section 8.16.2.3 "Adjustments Via Singler Health Option", p. 117*

→ *Section 8.16.2.4 "Adjustments Using Spring Scale", p. 120*

→ *Section 8.16.2.5 "Fine Adjustments of the Singler", p. 122*

8.4.6 Removing the Guide Roller Assembly (1R 16 MM)

This procedure shows how to remove the guide roller assembly (1R 16MM).

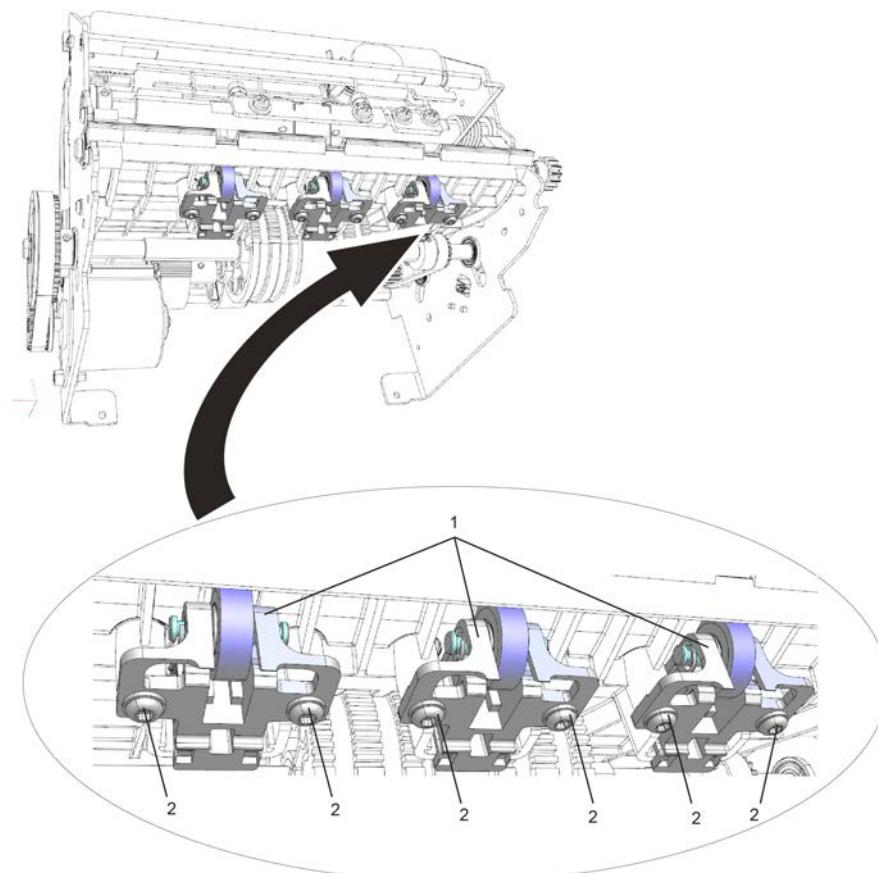


Figure 28: Removing the Guide Roller Assembly

8

Requirements

- Singler module is removed from BPS C2.
→ *Section 8.4.1 “Removing the Singler Module”, p. 52*

Procedure

- [1] Remove the screws (2).
- [2] Remove the guide roller assemblies (1).

Result

- ⇒ The guide roller assembly (1R 16MM) is removed.

8.4.7 Replacing the Roller Assembly (3R 1G)

This procedure shows how to replace the roller assembly (3R 1G).

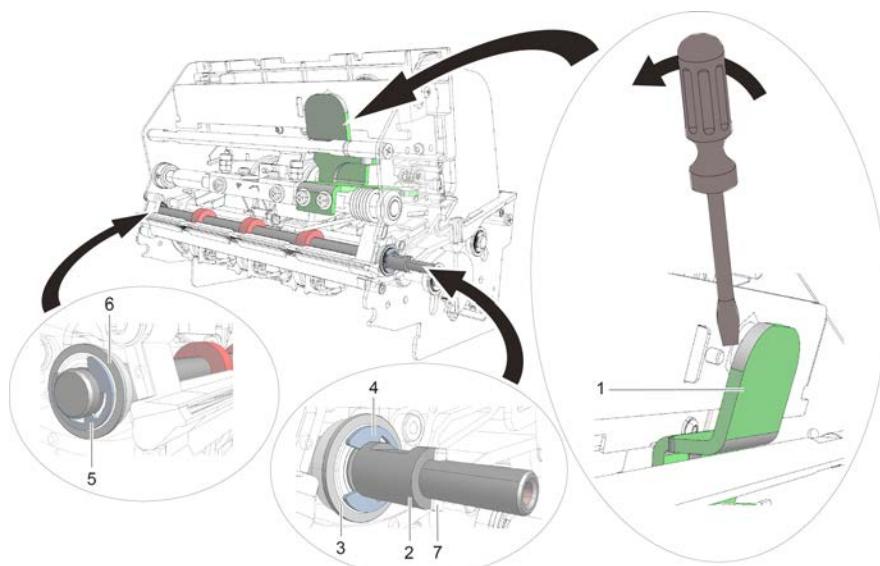


Figure 29: Replacing the Roller Assembly

Requirements

- Singler module is removed from BPS C2.
→ *Section 8.4.1 “Removing the Singler Module”, p. 52.*

Procedure

- [1] Remove the spur gear assembly (14T W6).
→ *Section 8.4.8 “Replacing the Spur Gear Assembly (14T W6)”, p. 64.*
- [2] Remove the locating pin (7).
- [3] Remove the circlip (4).
- [4] Dismount the bearing (3).
- [5] Remove the circlip (5).
- [6] Remove the bearing (6).
- [7] Press the stopper (1) using a flat head screwdriver.
- [8] Dismount the shaft (2).

Result

⇒ The roller assembly (3R 1G) is removed.

Mounting the Roller Assembly (3R 1G)

- [1] Press the stopper (1) using a flat head screwdriver.
- [2] Mount the shaft (2).
- [3] Mount the bearing (6).
- [4] Mount the circlip (5).
- [5] Mount the bearing (3).

Result ⇒ The roller assembly (3R 1G) is mounted.

8.4.8 Replacing the Spur Gear Assembly (14T W6)

This procedure shows how to replace the spur gear assembly (14T W6).

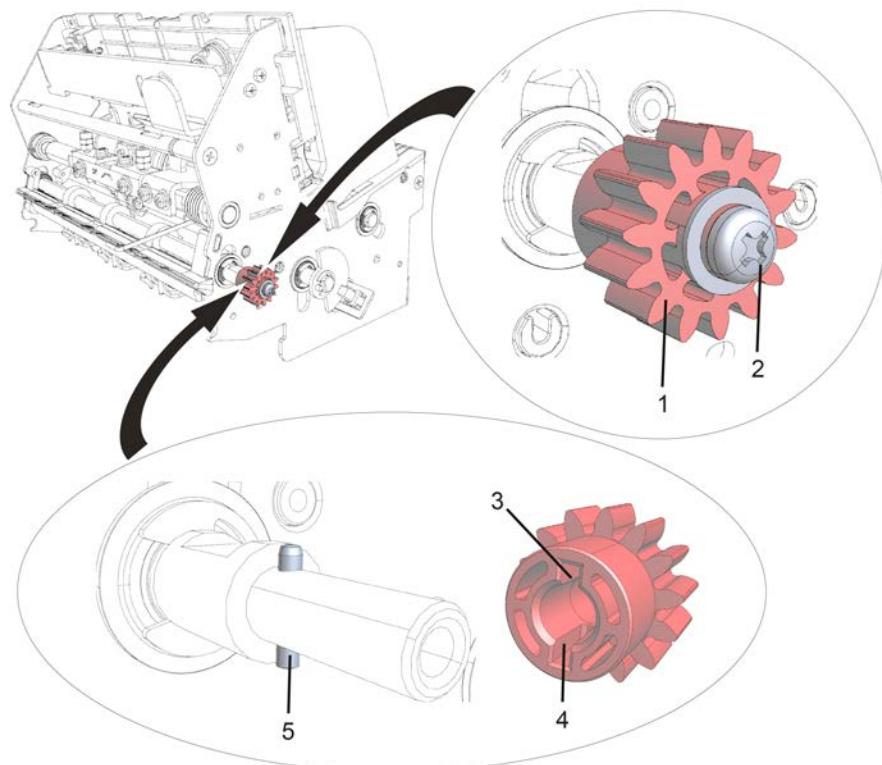


Figure 30: Replacing the Spur Gear assembly

Requirements

- Singler module is removed from BPS C2.
→ *Section 8.4.1 “Removing the Singler Module”, p. 52.*

Procedure

- [1] Remove the screw (2).
- [2] Remove the spur gear 14T W6 (1).

Result ⇒ The spur gear assembly (14T W6) is removed.

Mounting the Spur Gear assembly (14T W6)

- [1] Mount the spur gear 14T W6 (1) by locating the pin (5) into the grooves (3) & (4).

- [2] Fasten the screw (2).
- Result ⇒ The spur gear assembly (14T W6) is mounted.

8.4.9 Replacing the Singler Motor

This procedure shows how to replace the singler motor.

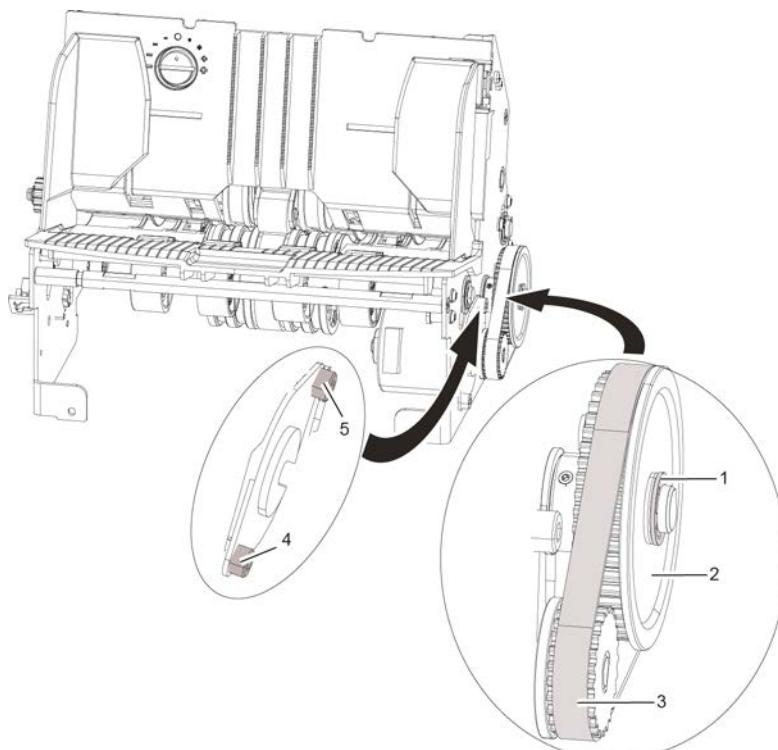
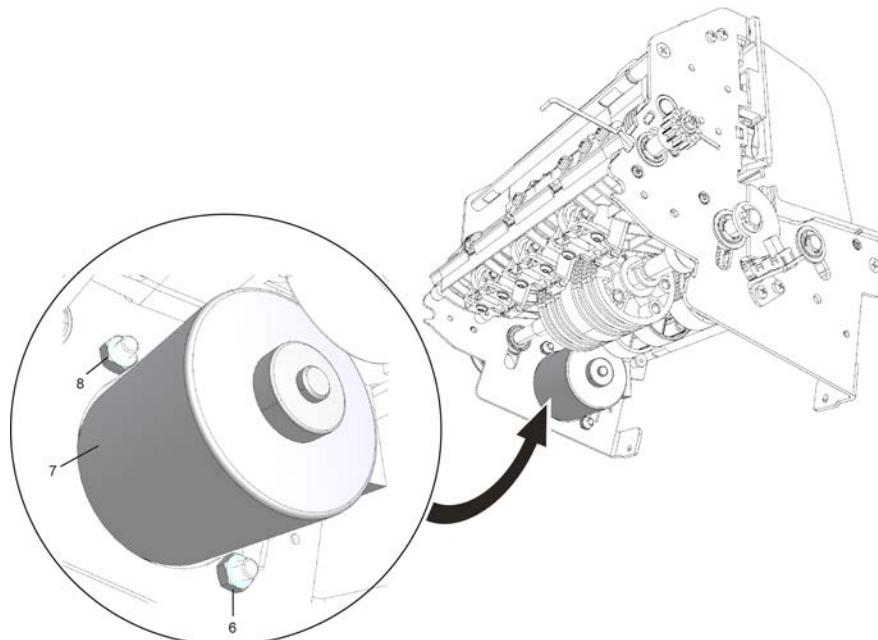


Figure 31: Removing the Singler Motor

- Requirements
- Singler module is removed from BPS C2.
→ *Section 8.4.1 “Removing the Singler Module”, p. 52*
- Procedure
- [1] Remove the timing belt (3).
- [2] Remove the screws (4) & (5).



[3] Remove the singler motor (7) along with the motor pulley.

Result

⇒ The singler motor is removed.

Mounting the Singler Motor

[1] Mount the singler motor (7) along with the motor pulley.

[2] Fasten the screws (4) & (5) along with the nuts (6) & (8) to secure the singler motor (7) in its position.

[3] Mount the timing belt (3) onto the timing pulley (2) and the timing pulley of the singler motor (7).

Result

⇒ The singler motor is mounted.

8

8.5 Replacing Parts in the Power Supply Assembly

This chapter contains the following information on replacing parts in the power supply assembly of BPS C2:

- → *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- → *Section 8.5.1 “Removing the Power Supply Unit”, p. 67.*
- → *Section 8.5.2 “Removing the EMI Filter”, p. 69.*
- → *Section 8.5.3 “Removing the Power Supply PCB”, p. 69.*
- → *Section 8.5.4 “Removing the Heat Exhaust Fan”, p. 70.*
- → *Section 8.5.5 “Removing the Main Fuses”, p. 71.*

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**NOTICE**

Electrostatic discharge possible

Electronic parts can be damaged.

1. Before starting any maintenance work, switch off the BPS C2.
2. Unplug the power plug from the power socket.
3. Secure the BPS C2 against being switched back on.

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

Requirements

- The BPS C2 is switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- Unplug the power chord and secure it so that it cannot be switched on again .
- The display unit cable is removed.
- The accessory cables from the USB ports are removed.
- The upper and lower rear covers removed.
→ *Section 8.3.10 “Removing the Upper Rear Cover ”, p. 48* →
Section 8.3.11 “Removing the Lower Rear Cover”, p. 50
- The upper and lower rear frames (LHS) removed.

8.5.1 Removing the Power Supply Unit

This procedure shows how to remove the power supply unit.

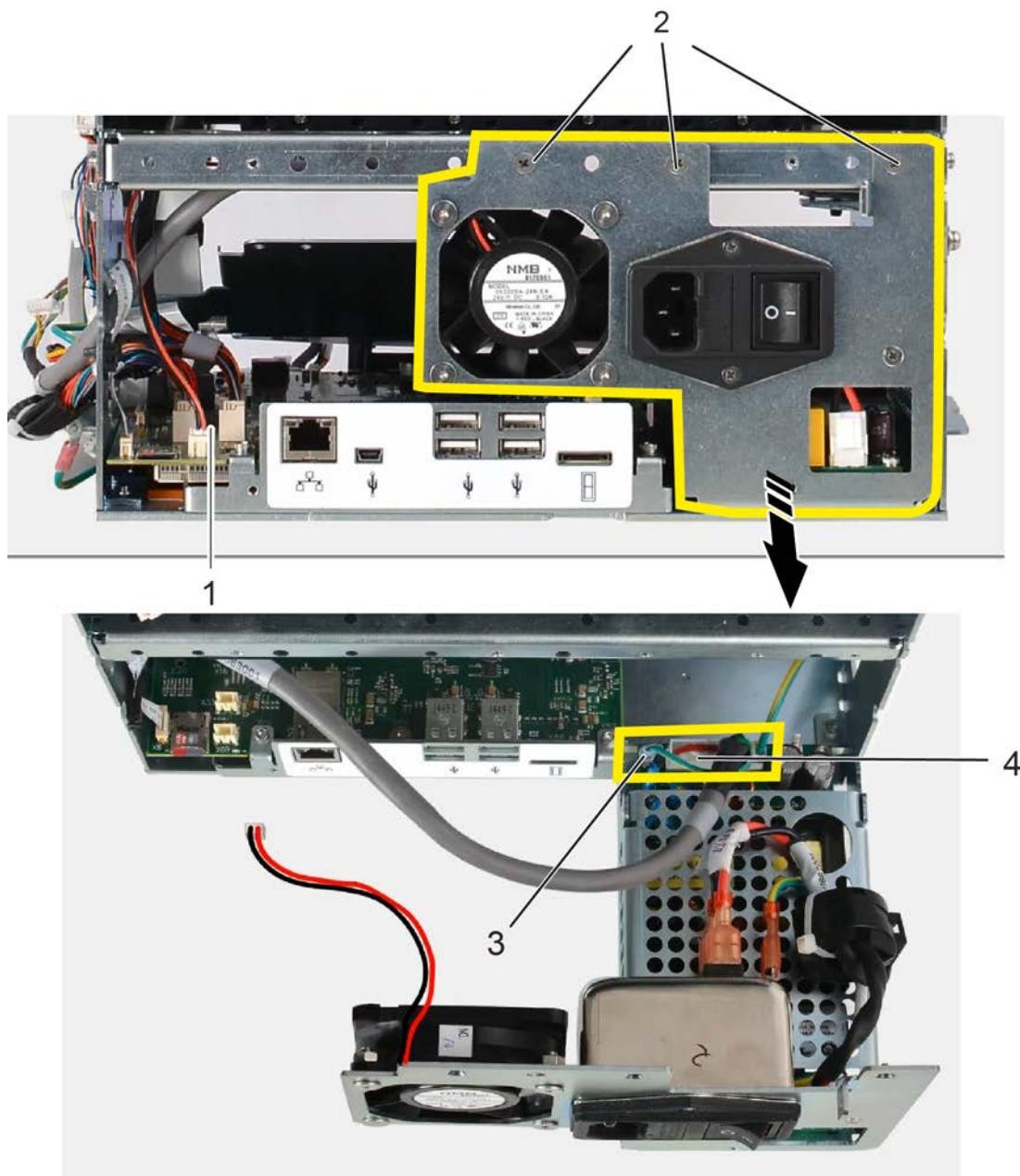


Figure 32: Power Supply Unit Removal

Procedure

- [1] Unplug the fan connector (1).
- [2] Remove the three screws (2) from the power supply unit.
- [3] Gently slide out the power supply unit from BPS C2.
- [4] Unplug the ground cable connector (3).
- [5] Unplug the connector (4).

Result

⇒ The power supply unit is removed.

8.5.2 Removing the EMI Filter

This procedure shows how to remove the EMI Filter.

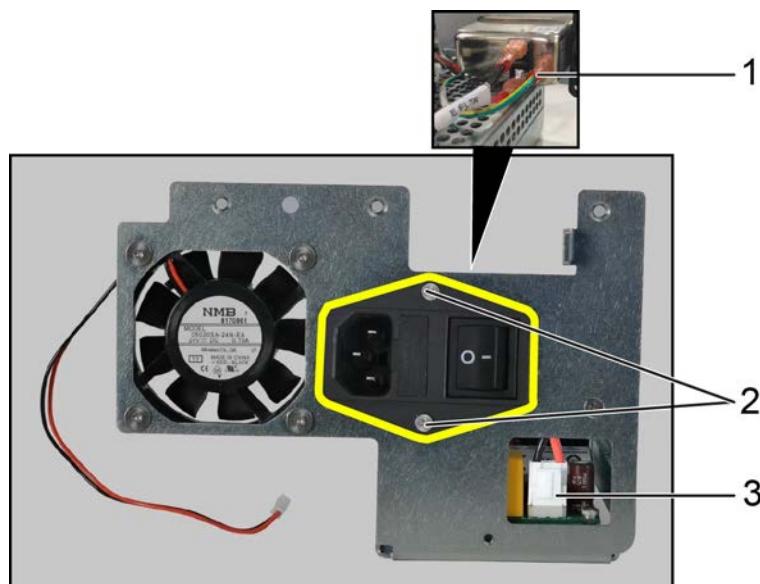


Figure 33: EMI Filter Removal

Requirements

- The power supply unit is removed.
→ *Section 8.5.1 “Removing the Power Supply Unit”, p. 67.*

Procedure

- [1] Unplug the ground connector (1).
- [2] Remove the screws (2).
- [3] Unplug the EMI filter (3) from the power supply PCB.
- [4] Remove the EMI filter.

Result

- ⇒ The EMI filter is removed.

8.5.3 Removing the Power Supply PCB

This procedure shows how to remove the power supply PCB.

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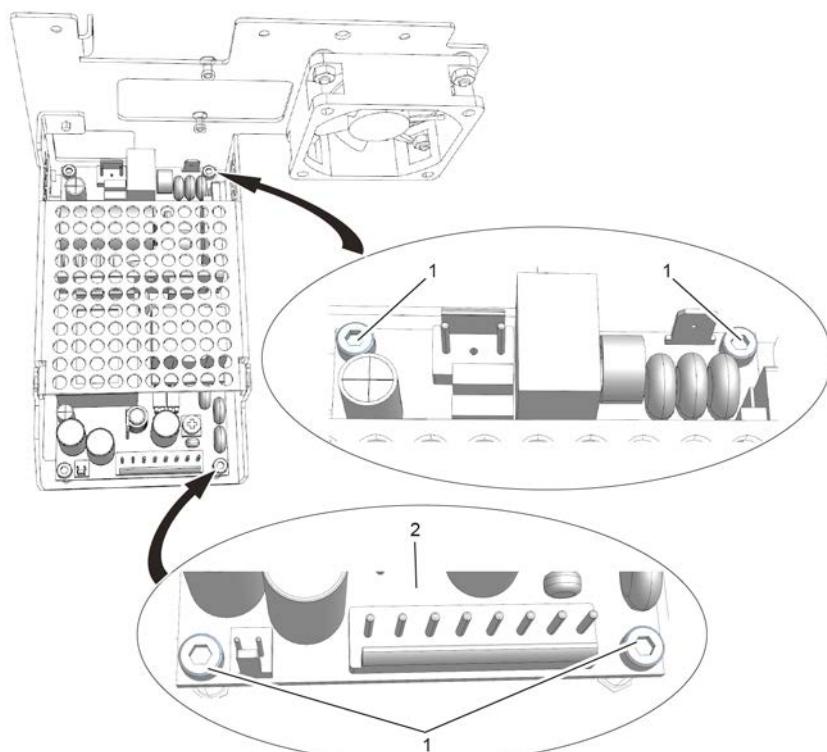


Figure 34: Removing the Power Supply PCB

Requirements

8

- The power supply tray is removed.
→ *Section 8.5.1 “Removing the Power Supply Unit”, p. 67.*
- The EMI filter is removed.
→ *Section 8.5.2 “Removing the EMI Filter”, p. 69.*

Procedure

- [1] Remove the four screws (1).
- [2] Pull and then remove the power supply PCB (2).

Result

- ⇒ The power supply PCB is removed.

8.5.4 Removing the Fan

The fan is installed on BPS C2 power supply unit near the PCB main. The fan removes the heat generated by the power supply PCB and the PCB main.

This procedure shows how to remove the fan.

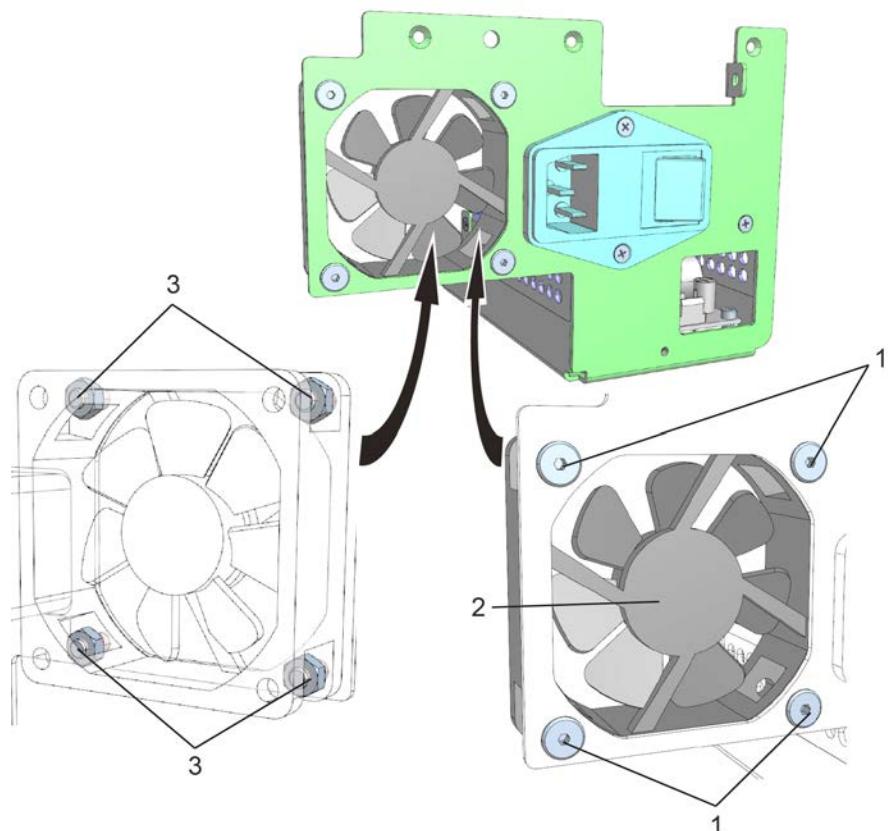


Figure 35: Removing the Fan

8

Requirements

- The power supply unit is removed.
→ *Section 8.5.1 “Removing the Power Supply Unit”, p. 67.*

Procedure

- [1] Remove the four screws (1) along with the four nuts (3) from the fan (2).
- [2] Remove the heat exhaust fan (2).

Result

⇒ The fan is removed.

8.5.5 Removing the Main Fuses

Fuse protection for the main power input is provided by two pluggable cartridge fuses of value 3.15 A each on the EMI filter. The position of the fuses (3) can be seen in the following illustration.
This procedure shows how to remove the main fuses.

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Procedure

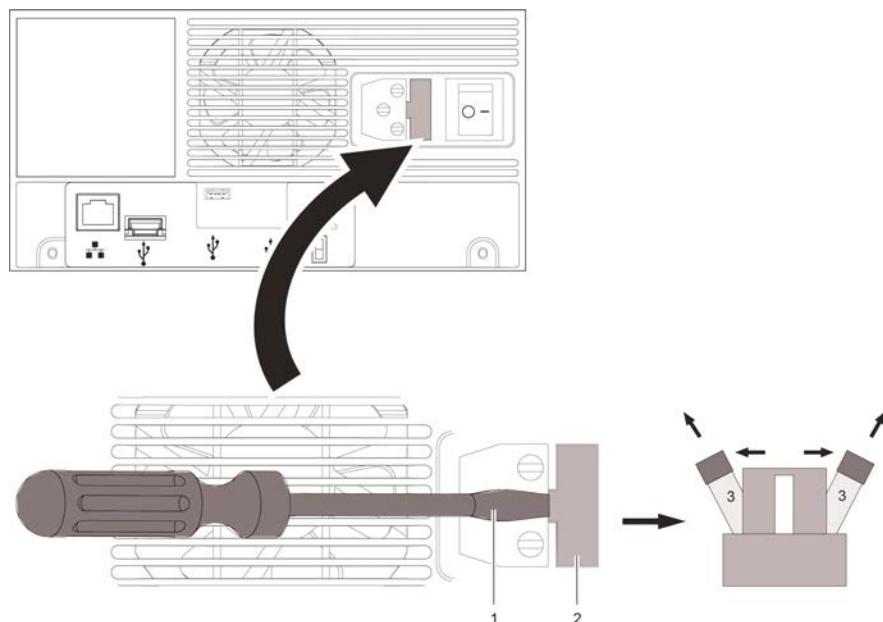


Figure 36: Removing the Main Fuses

- [1] Remove the fuse holder (2) using a flat-headed screwdriver.
- [2] Remove both the fuses (3) from the fuse holder (2).

Result

- ⇒ The main fuses are removed.

8.6 Removing the Upper Sensor Housing

Requirements

- The BPS C2 is switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The BPS C2 is opened.
→ *Section 8.2.2.1 “Opening the BPS C2”, p. 36*
- The side and mid covers on both sides are removed.
→ *Section 8.3.4 “Removing the Side Cover (LHS/RHS)”, p. 41*
→ *Section 8.3.7 “Removing the Mid Cover (LHS/RHS)”, p. 44*

Procedure

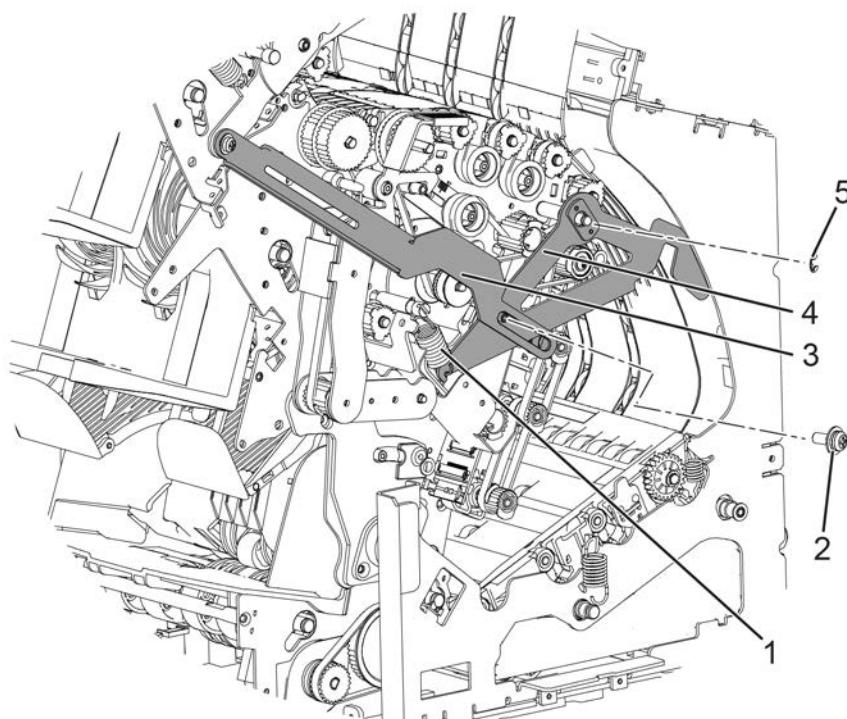
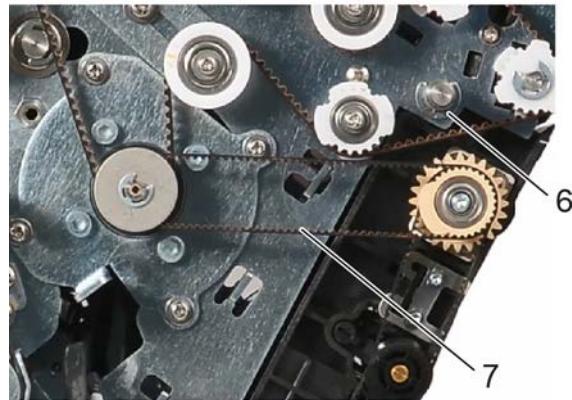
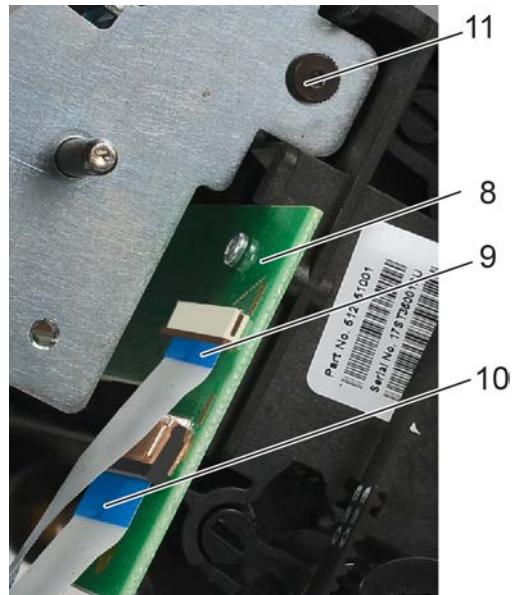


Figure 37: Latch Bracket Removal

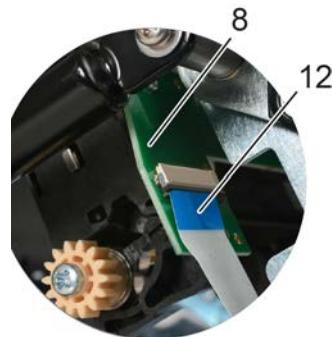
- [1] Remove the torsion springs (1) on both sides.
- [2] Remove the screws (2) on both sides.
- [3] Detach the latch extension brackets (3) on both sides.
- [4] Remove the circlips (5) on both sides.
- [5] Remove the lower latch brackets (4) on both sides of the BPS C2.



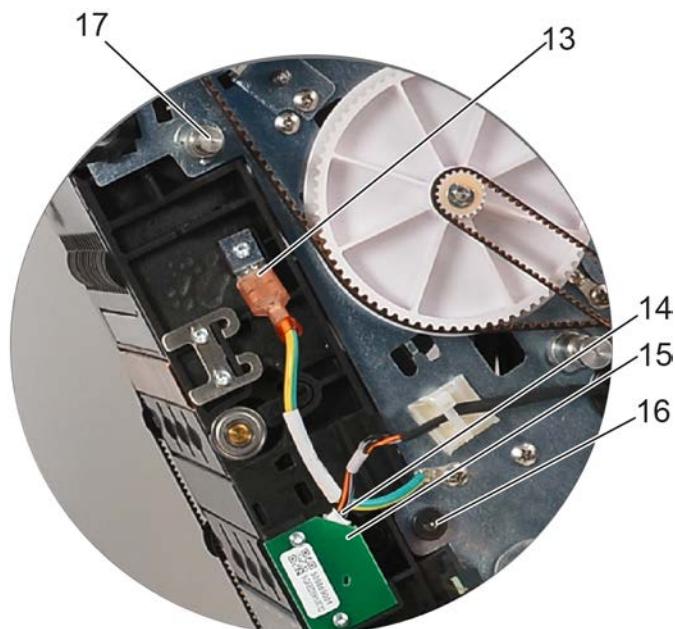
- [6] Remove the circlips (6) on both sides.
- [7] Dismount the belt (7) from the spur gear of the sensor housing.



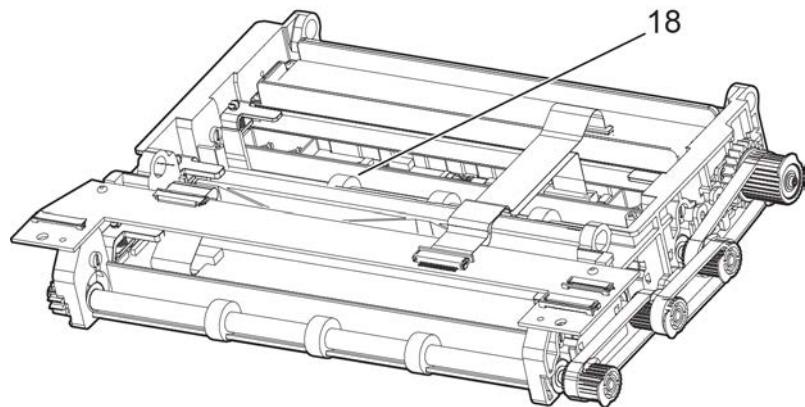
- [8] Gently, unlock and unplug the MAG cable (9) from the connector on the BASB (8).
- [9] Gently, unlock and unplug the MTS cable (10) from the connector on the BASB (8).
- [10] Remove the screw (11).



- [11]** Gently, unlock and unplug the PIS cable (12) from the connector on the BASB (8).



- [12]** Unplug the ground connector (13).
- [13]** Unplug the encoder connector (14) from the encoder assembly (15).
- [14]** Remove the screw (16).
- [15]** Hold the sensor housing assembly (18) with one hand and remove the shaft (17).



[16] Remove the sensor housing (18) from the BPS C2.

Result \Rightarrow The upper sensor housing is removed.

8.6.1 Removing the MTS

Requirements

- The upper sensor housing removed.
 \rightarrow Section 8.6 “Removing the Upper Sensor Housing”, p. 72

Procedure

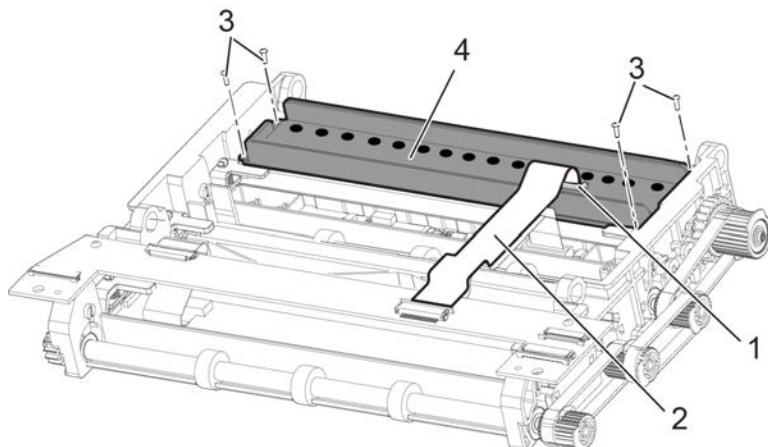
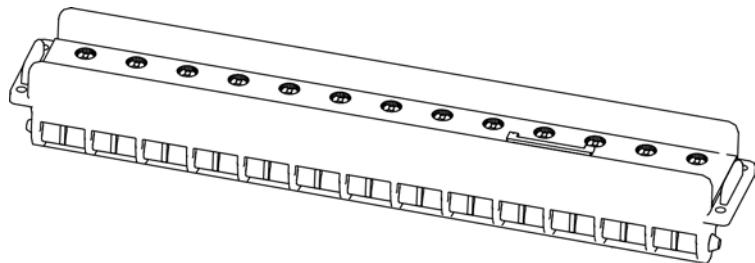


Figure 38: MTS Removal

- [1]** Gently, unlock (1) and unplug the cable (2) from the connector.
- [2]** Remove the screws (3) on both sides.
- [3]** Remove the MTS assembly (4) from the upper sensor housing.

Result \Rightarrow The MTS is removed.



8.6.2 Removing MAG Sensor

Requirements

- The upper sensor housing assembly removed.
 → *Section 8.6 “Removing the Upper Sensor Housing”, p. 72*

Procedure

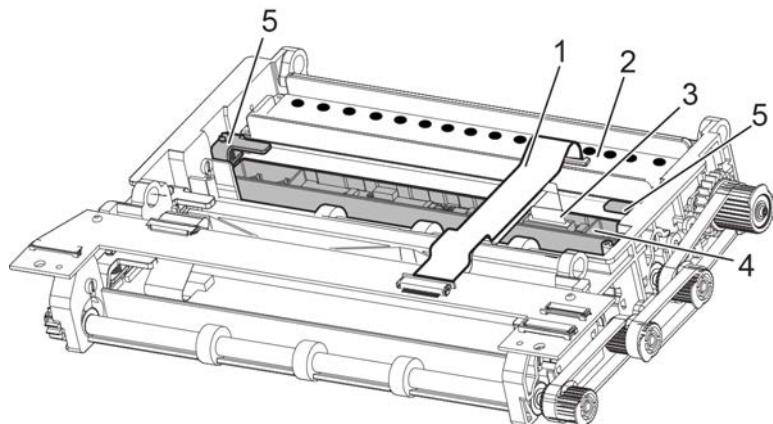


Figure 39: MAG Sensor Removal

- [1] Gently, unlock and unplug the MTS Cable (1) from the MTS sensor (2) connector .
- [2] Gently, unlock and unplug the MAG Cable (3) from the MAG sensor (4) connector.

**Important!**

Press down and move the locking latch (5) sideways till it is removed from its position.

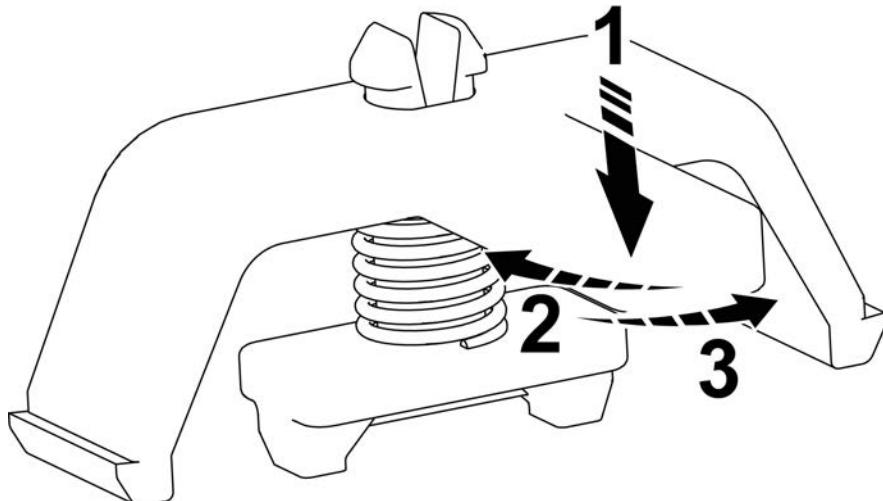
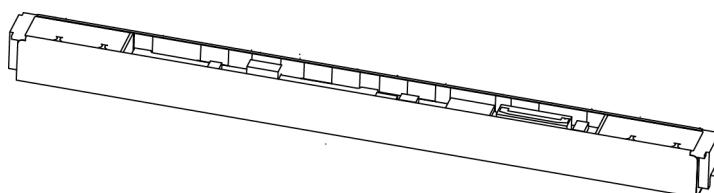


Figure 40: Lock Latch Removal

- [3] Remove the locking latches (5) on both sides.
 - [4] Remove the MAG sensor (4) from the upper sensor housing.
- Result ⇒ The MAG sensor is removed.



8.6.3 Removing the Encoder Assembly

Requirements

- The upper sensor housing assembly removed.
→ Section 8.6 “Removing the Upper Sensor Housing”, p. 72

Procedure

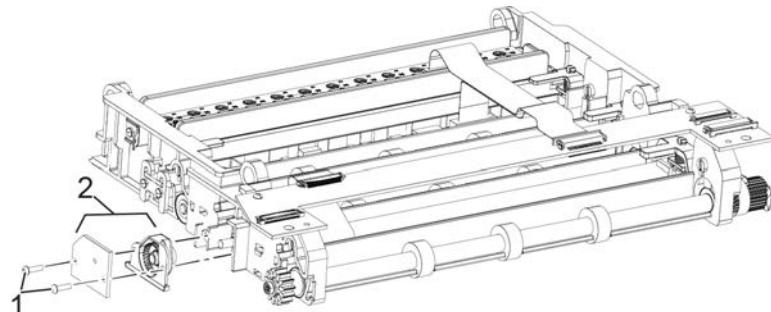


Figure 41: Encoder Removal

- [1] Remove the screws (1).
- [2] Remove the encoder assembly (2) from the sensor drive roller shaft.

Result \Rightarrow The encoder assembly is removed.

8.6.4 Removing the Drive Rollers assembly

Recommended to replace all the drive rollers assemblies together.

Requirements

- The upper sensor housing assembly removed.
→ *Section 8.6 “Removing the Upper Sensor Housing”, p. 72*
- For the drive roller assembly (5) removal, first, the encoder assembly is removed.
→ *Section 8.6.3 “Removing the Encoder Assembly”, p. 78*

Procedure

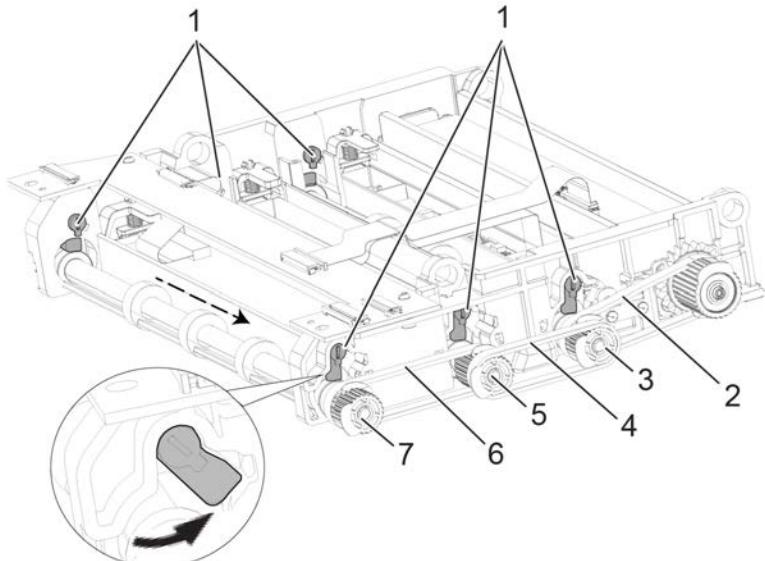
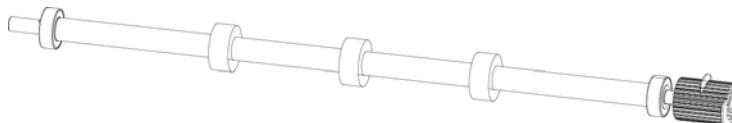


Figure 42: Drive Rollers Assembly Removal

- [1] Remove the belt (4).
- [2] Remove the belts (2, 6).
- [3] Turn the respective lock bearings (1) on both sides in anti-clock wise direction to unlock.
- [4] Slide and remove the drive roller assemblies (3, 5, 7) from the upper sensor housing assembly.

Result

⇒ The drive roller assemblies (3, 5, 7) are removed.



8.7 Removing the Lower Sensor Housing

Requirements

- The BPS C2 switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The BPS C2 opened.
→ *Section 8.2.2.1 “Opening the BPS C2”, p. 36*
- The side and mid covers on both sides are removed.
→ *Section 8.3.7 “Removing the Mid Cover (LHS/RHS)”, p. 44*
→ *Section 8.3.4 “Removing the Side Cover (LHS/RHS)”, p. 41*

Procedure

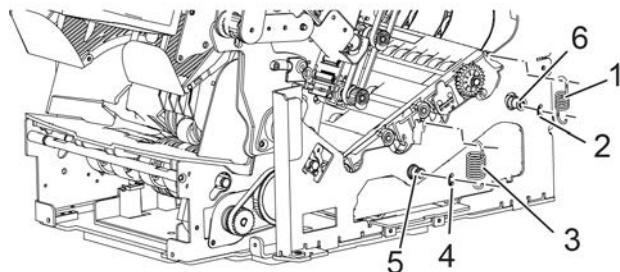
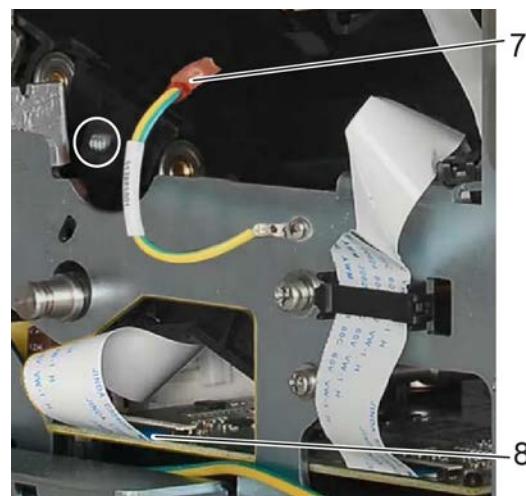
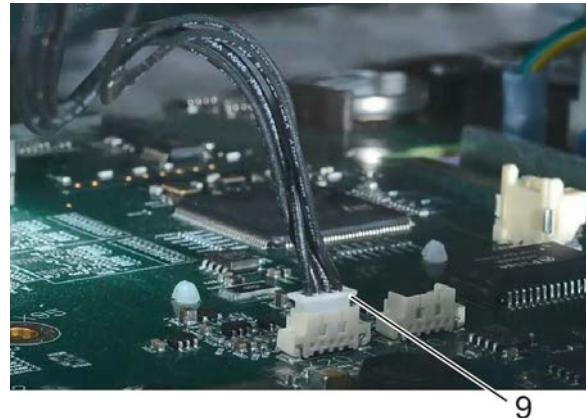


Figure 43: Torsion Spring Removal

- [1] Remove the torsion springs (1) on both sides.
- [2] Remove the circlips (2) on both sides.
- [3] Remove the torsion springs (3) on both sides.
- [4] Remove the circlips (4) on both sides.



- [5] Unplug the ground connector (7).
- [6] Gently, unlock and unplug the PIS 1 cable (8) from the connector on the PCB Main.



- [7] On the rear side, unplug the UV cable connector (9) from the PCB Main.
- [8] Remove the shafts (5) and (6).

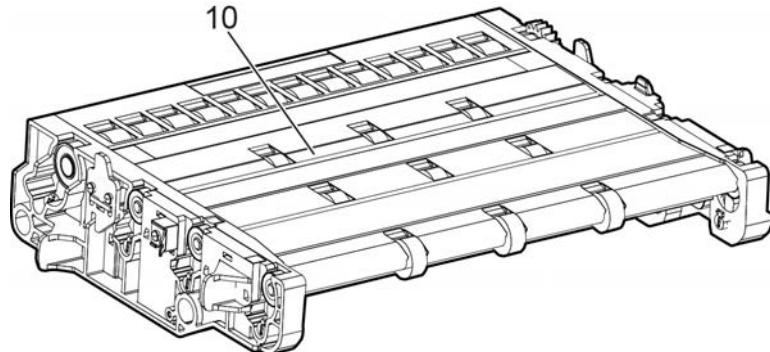


Figure 44: Lower Sensor Housing Removal



Important!

Pay attention to PIS and UV cables for damage, while removing the sensor housing.

Result

- [9] Remove the lower sensor housing (10) out of the BPS C2.
 ⇒ The lower sensor housing is removed.

8.7.1 Removing the UV sensor

Requirements

- The lower sensor housing removed.
 → *Section 8.7 “Removing the Lower Sensor Housing”, p. 80*

Procedure

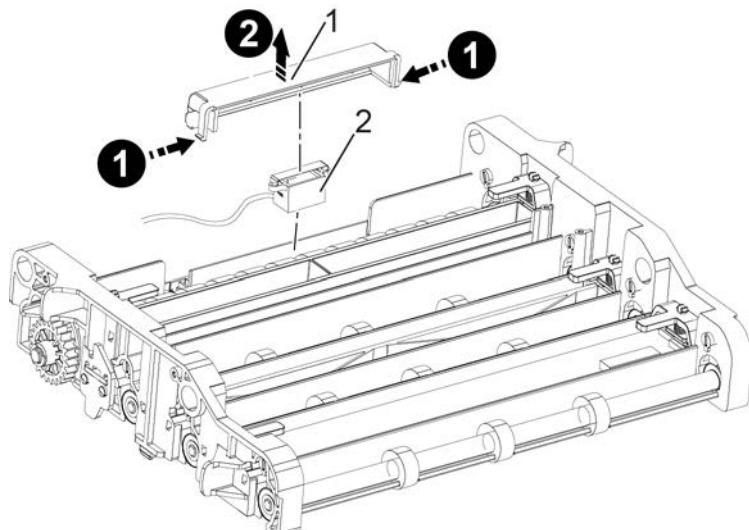


Figure 45: UV Sensor Removal

- [1] Hold, press the locks (on both sides) and remove the cover (1).
- [2] Remove the UV sensor (2) along with the cable from the lower sensor housing (3).

Result \Rightarrow The UV sensor is removed.

8

8.7.2 Removing the Transport Rollers

There are three transport roller and one MTS roller assembly in the lower sensor housing. Follow the same removal procedure for all roller assemblies.

Replace all the roller assemblies together.

Requirements

- The lower sensor housing removed.
 \rightarrow Section 8.7 “Removing the Lower Sensor Housing”, p. 80

Procedure

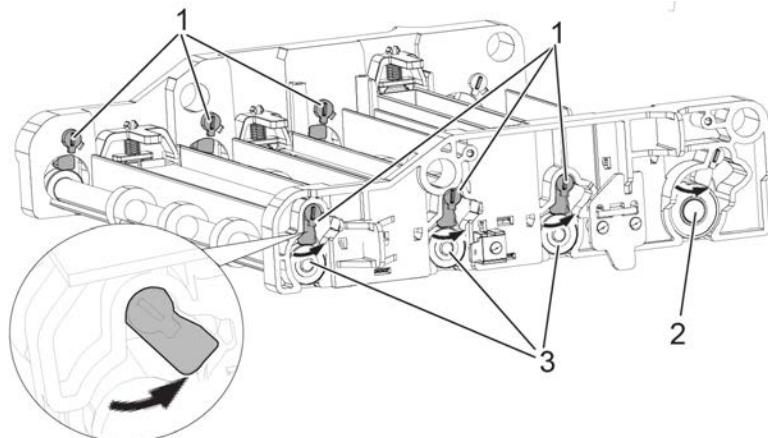
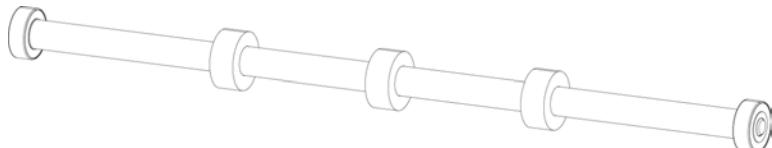


Figure 46: Sensor Transport Rollers removal

- [1] Turn the respective lock bearings (1) in anticlockwise direction to unlock (on both sides).
- [2] Remove the MTS (2) and the transport rollers (3) from the lower sensor housing.

Result

⇒ The MTS and the transport rollers are removed.



8.8 Removing the BASB

Requirements

- The upper sensor housing removed.
→ *Section 8.6 "Removing the Upper Sensor Housing", p. 72*

Procedure

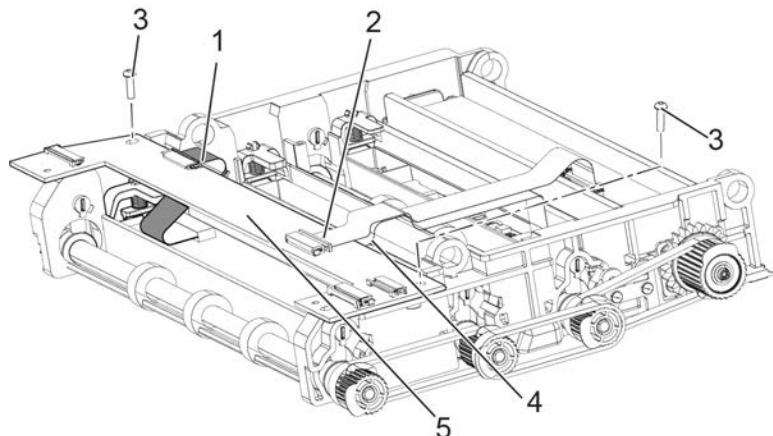
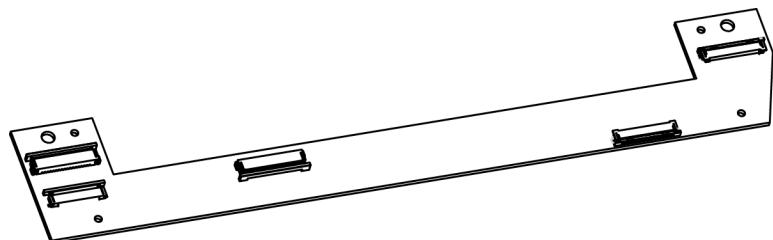


Figure 47: BASB Removal

- [1] Gently, unlock and unplug the PIS 2 flex cable (1) from the connector on the BASB (5).
- [2] Gently, unlock and unplug the MTS flex cable (2) from the connector on the BASB (5).
- [3] Remove the screws (3) on the BASB (5).
- [4] Dismount the BASB (5) along with MAG flex cable (4).
- [5] Unlock and unplug the MAG flex cable (4) from the connector on the BASB (5).

Result

⇒ The BASB is removed.



8.9 Removing the Image Sensors (PIS 1 and PIS 2)

Recommended to replace the PIS 1 (lower sensor housing) and PIS 2 (upper sensor housing) together.

Requirements

- The upper sensor housing removed.
→ *Section 8.6 “Removing the Upper Sensor Housing”, p. 72*
- The lower sensor housing removed.
→ *Section 8.7 “Removing the Lower Sensor Housing”, p. 80*

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Removing the PIS 1 (Lower Sensor Housing)

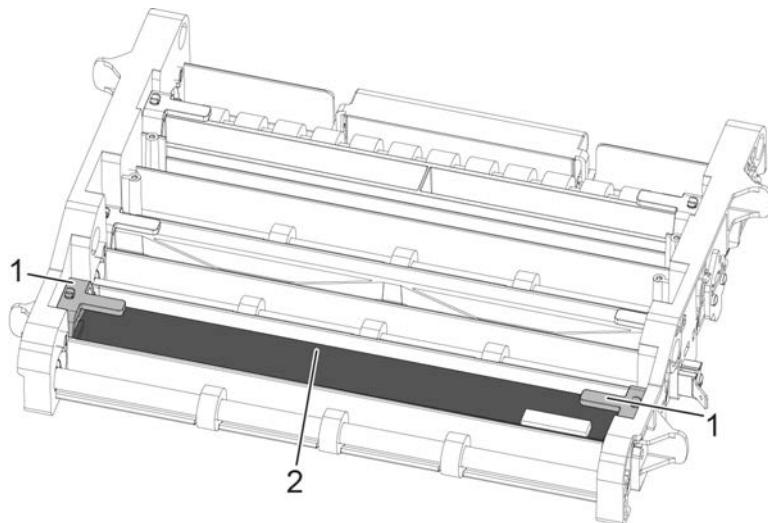


Figure 48: PIS 1 Removal

- [1] Remove the locking latches (1) on both sides.

**Important!**

Press and move the locking latch (1) sideways till it is removed from its position.

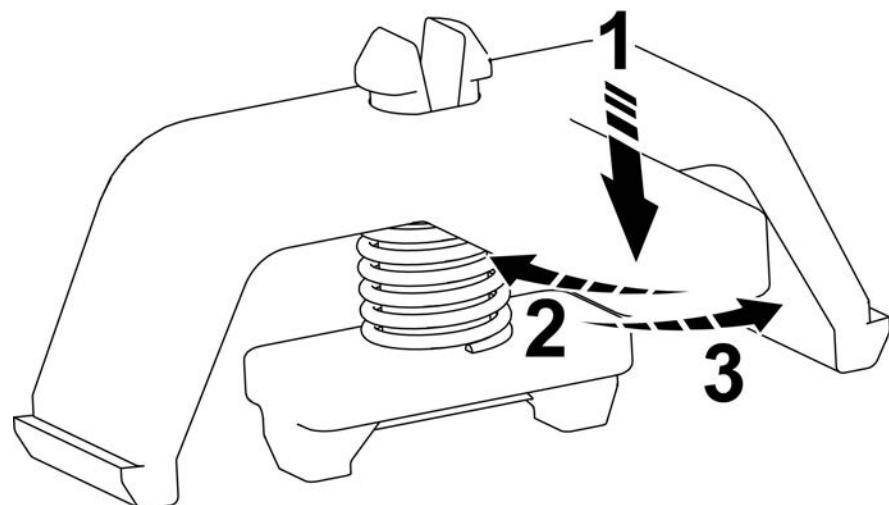


Figure 49: Locking Latch Removal

- [2] Remove the PIS 1 (2) from the Lower sensor housing.

Removing the PIS 2 (Upper Sensor Housing)

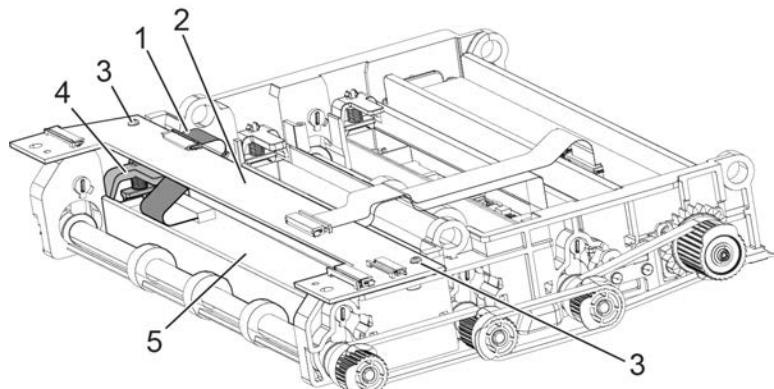


Figure 50: PIS 2 Removal

- [3] Gently, unlock and unplug the PIS 2 flex cable (1) from the connector on the BASB (2).
- [4] Remove the screws (3) on the BASB (2).
- [5] Along with the flex cables, dismount the BASB (2) from the upper sensor housing.



Important!

Press and move the locking latch (4) sideways till it is removed from its position.

8

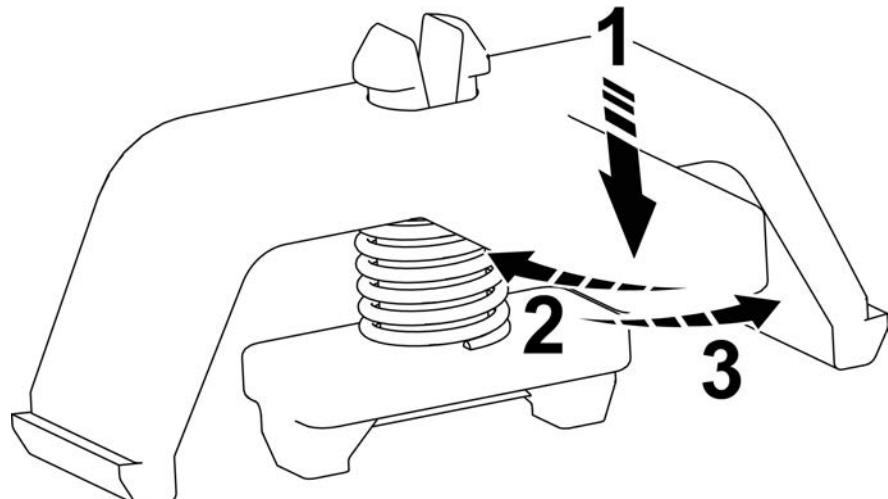
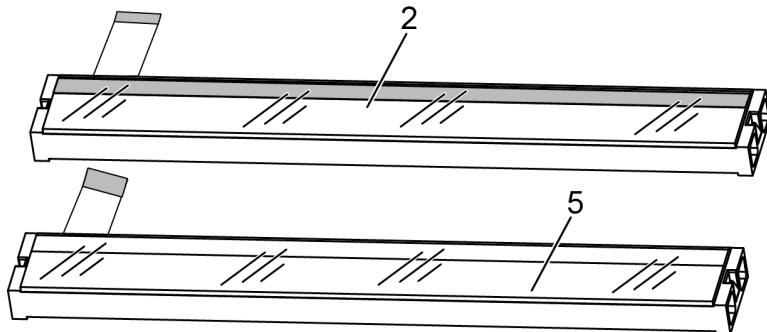


Figure 51: Locking Latch Removal

- [6] Remove the locking latches (4) on both sides.
- [7] Remove the PIS 2 (5) from the upper sensor housing.

Result

⇒ The PIS 1 and PIS 2 are removed.

**Important!**

Presence of light guide strip (grey colored) on the PIS 2 differentiates from PIS 1.

8.10 Removing the Guide Roller Assembly (3R 16 MM)

Requirements

- The side covers on both sides are removed.
→ *Section 8.3.4 "Removing the Side Cover (LHS/RHS)", p. 41*

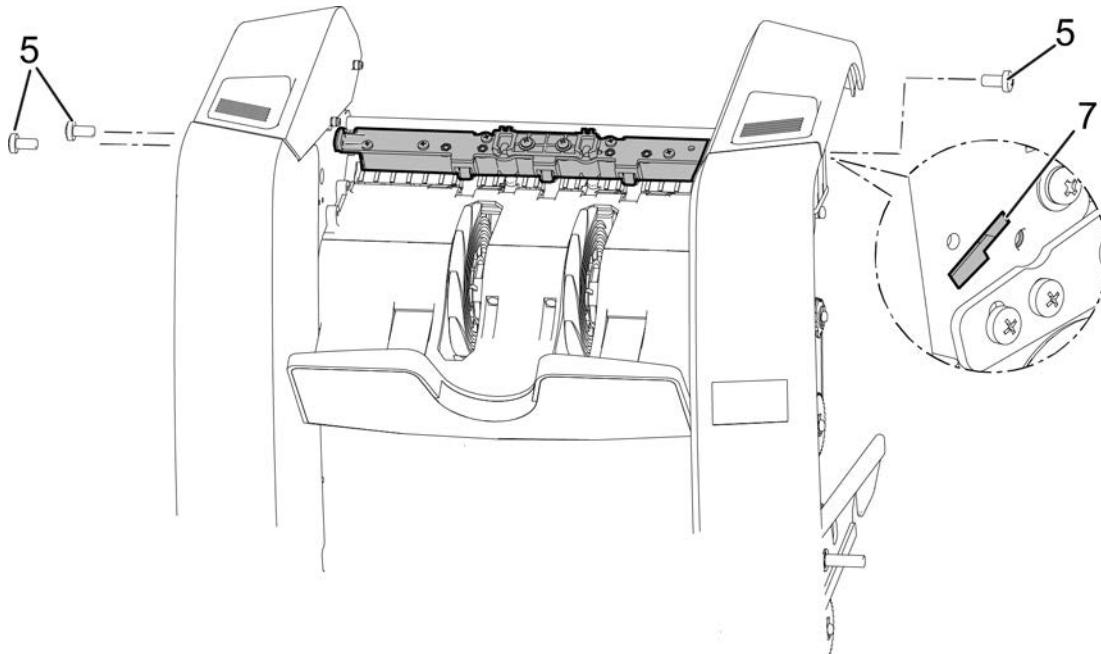


Figure 52: Guide Roller Assembly Removal (3R 16 MM)

[1]

Top cover is not shown for the sake of clarity.

Remove the two screws (5) from LHS and the screw (5) from RHS of the BPS C2.

**NOTICE**

Incorrect handling

can cause permanent damage to the guide roller assembly (6).

There is notch (7) provided for easy removal or installation. Pay attention while removing or installing the guide roller assembly.

- [2] Remove the guide roller assembly (6) from the notch (7) side.

Result

⇒ The guide roller assembly (3R 16 MM) is removed.

8.11 Removing the Guide Roller Assembly (3R 20 MM)

There are six guide rollers in the base module and six guide rollers in the rear module.

Follow the same removal procedure for all the guide roller assemblies.

Requirements

- The BPS C2 switched off.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- The base covers on both sides are removed.
→ *Section 8.3.6 “Removing the Base Cover (LHS/RHS)”, p. 43*
- The upper and lower rear frames on both sides are removed.
- The upper and lower rear covers are removed.
→ *Section 8.3.10 “Removing the Upper Rear Cover ”, p. 48*
→ *Section 8.3.11 “Removing the Lower Rear Cover”, p. 50*

Procedure

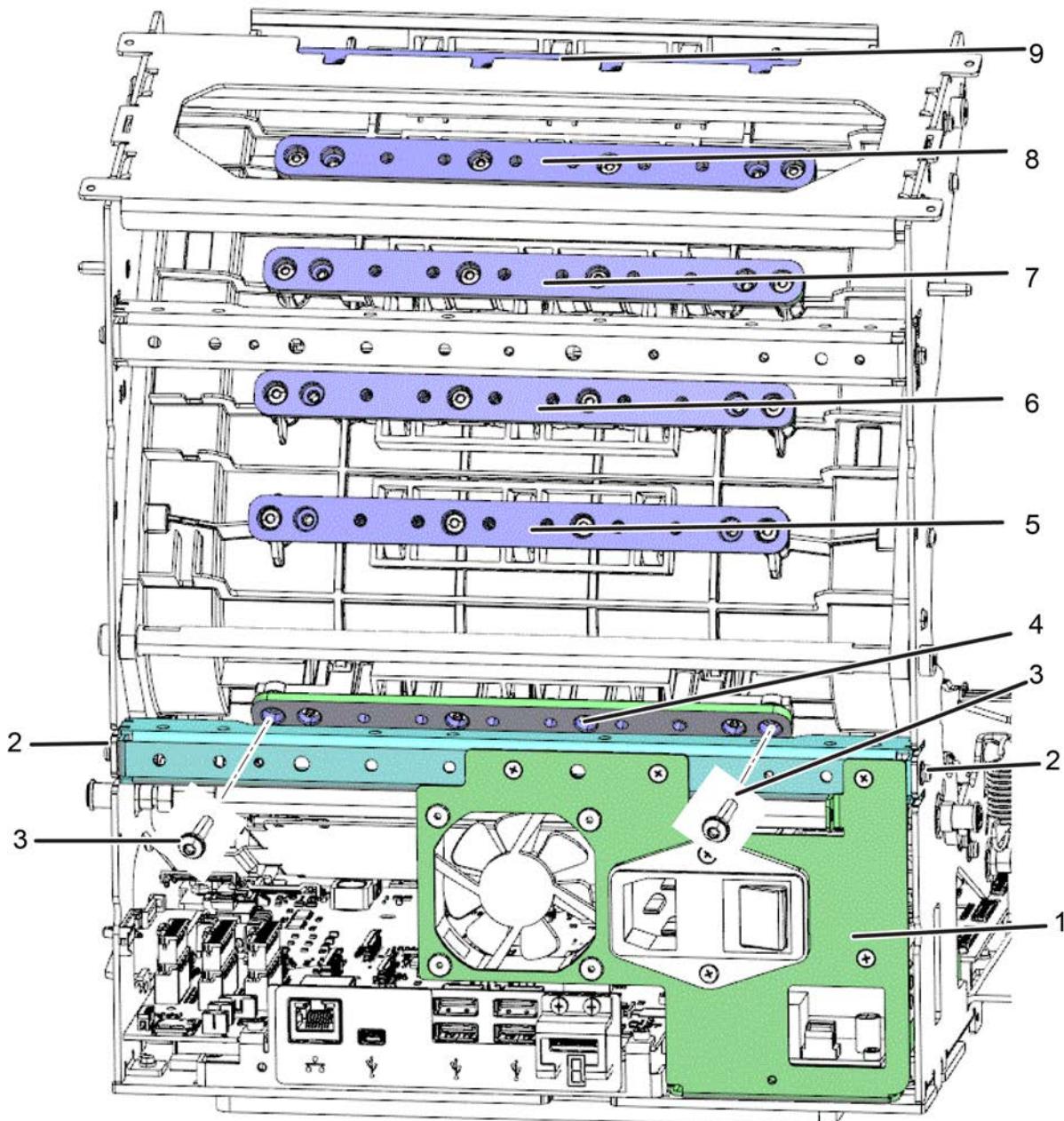


Figure 53: Guide Roller Assembly Removal (3R 20 MM)

- [1] Remove the two screws (2) from both sides of the BPS C2.
- [2] Gently slide out the power supply unit (1). Do not remove it completely.
- [3] Remove the two screws (3).

- [4] Remove the guide roller assembly (4) from the BPS C2.

Removing the Guide Roller Assemblies (5, 6, 7)

- [5] Repeat the step 4 and step 5 for removal.

Removing the Guide Roller Assemblies (8, 9, 13 - 18)

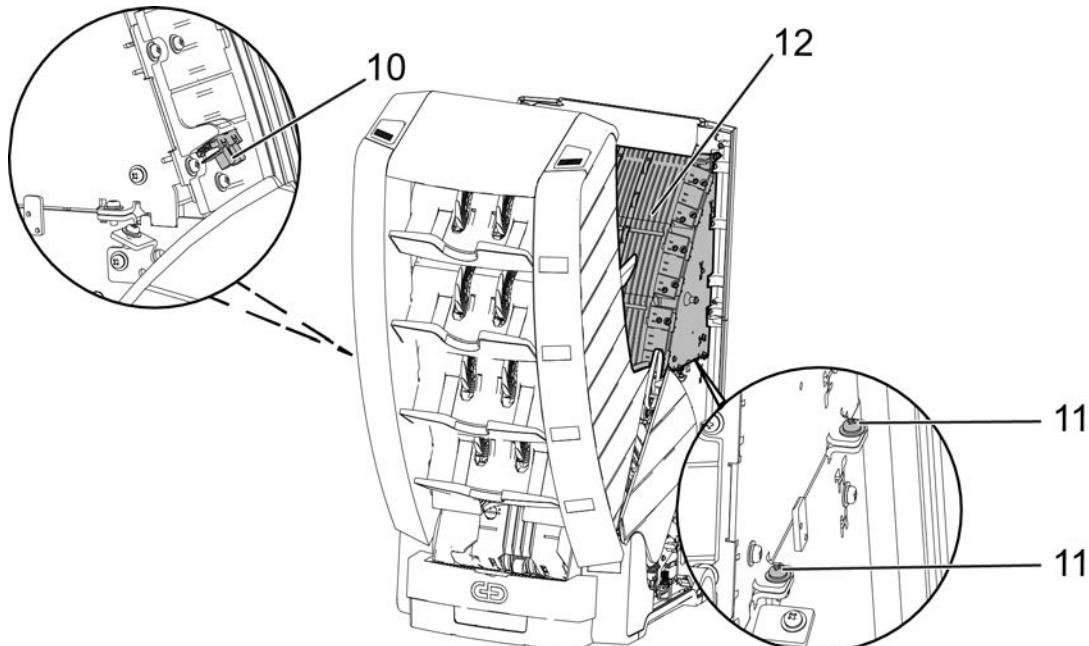


Figure 54: Rear Module Removal



Important!

The rear module (12) is removed for guide roller assemblies (8, 9, 13 - 18) removal.

- [6] Unplug the Open/Close PD connector (10).

- [7] Remove the four screws (11).

- [8] Remove the rear module (12).

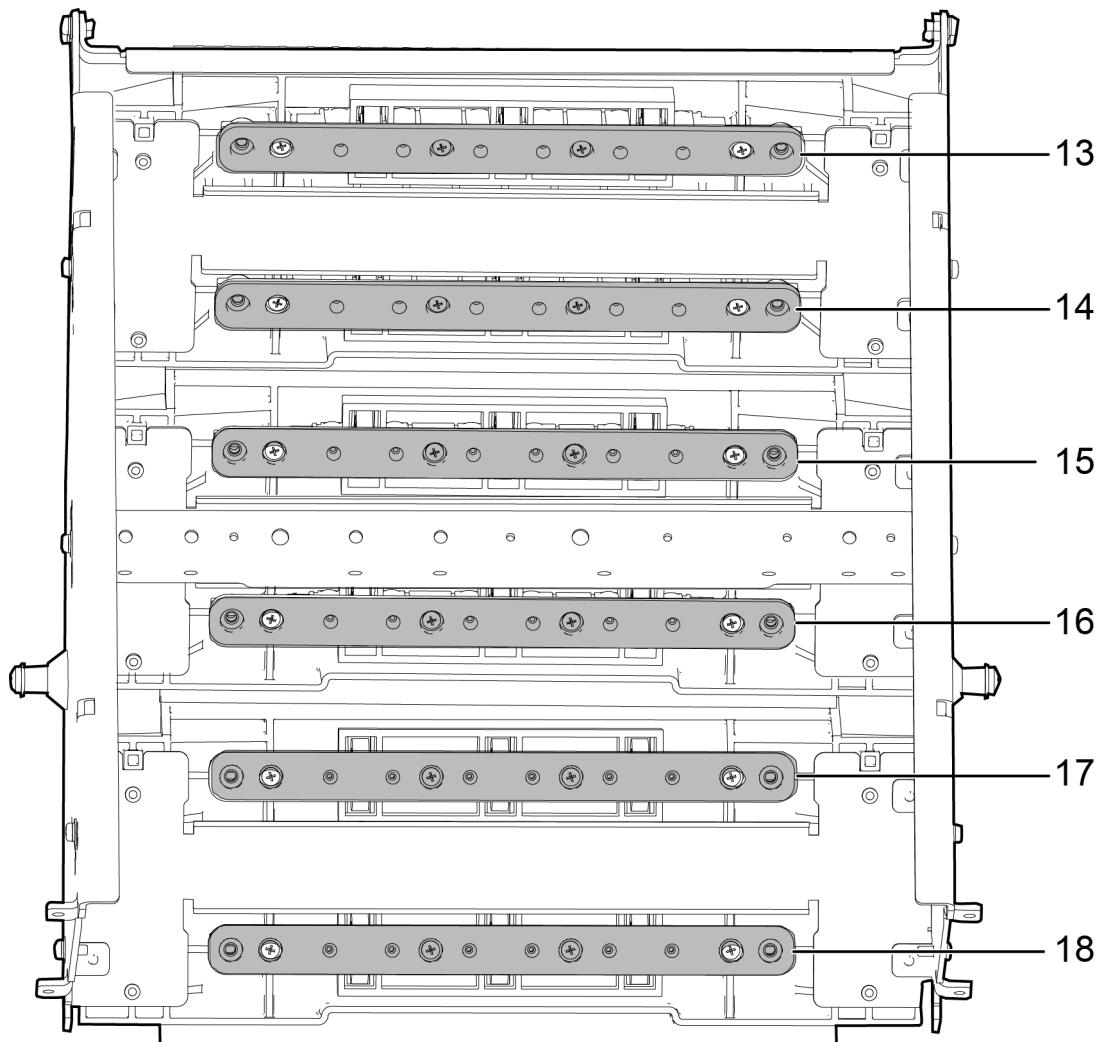


Figure 55: Guide Rollers Removal (Rear Module)

- [9] Repeat the step 4 and step 5 for guide rollers removal.
 Result ⇒ The guide roller assemblies (3R 20 MM) are removed.

8.12 Replacing the Solenoid Switch

There are solenoid switches on the LHS of the BPS C2.

Requirements

- To remove the solenoid switches, corresponding covers are removed.
 → *Section 8.3.7 “Removing the Mid Cover (LHS/RHS)”, p. 44*
 → *Section 8.3.4 “Removing the Side Cover (LHS/RHS)”, p. 41*

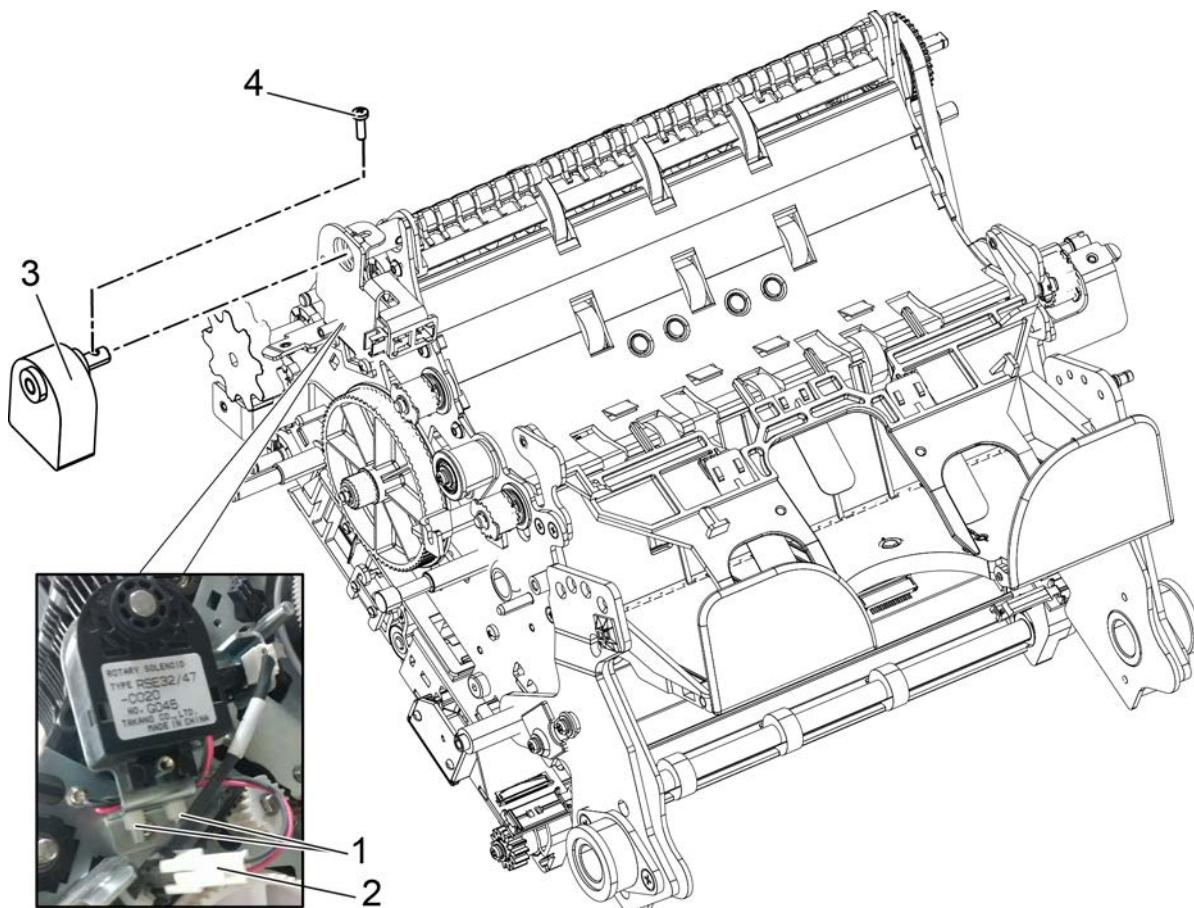


Figure 56: Solenoid Switch Removal

8

Procedure

- [1] Cut the cable ties (1).
- [2] Unplug the solenoid connector (2).
- [3] Remove the screw (4).
- [4] Detach the solenoid switch (3) from the diverter shaft.

Installing the new solenoid Switch

**Important!**

Apply thread lock to the screw (4) before installing.

Tie the cables to the solenoid with the wire ties.

[5] Installation is in reverse order of removal procedure.

Result

⇒ The solenoid switch is replaced.

**Important!**

After solenoid switch replacement, diverter gate needs adjustment.

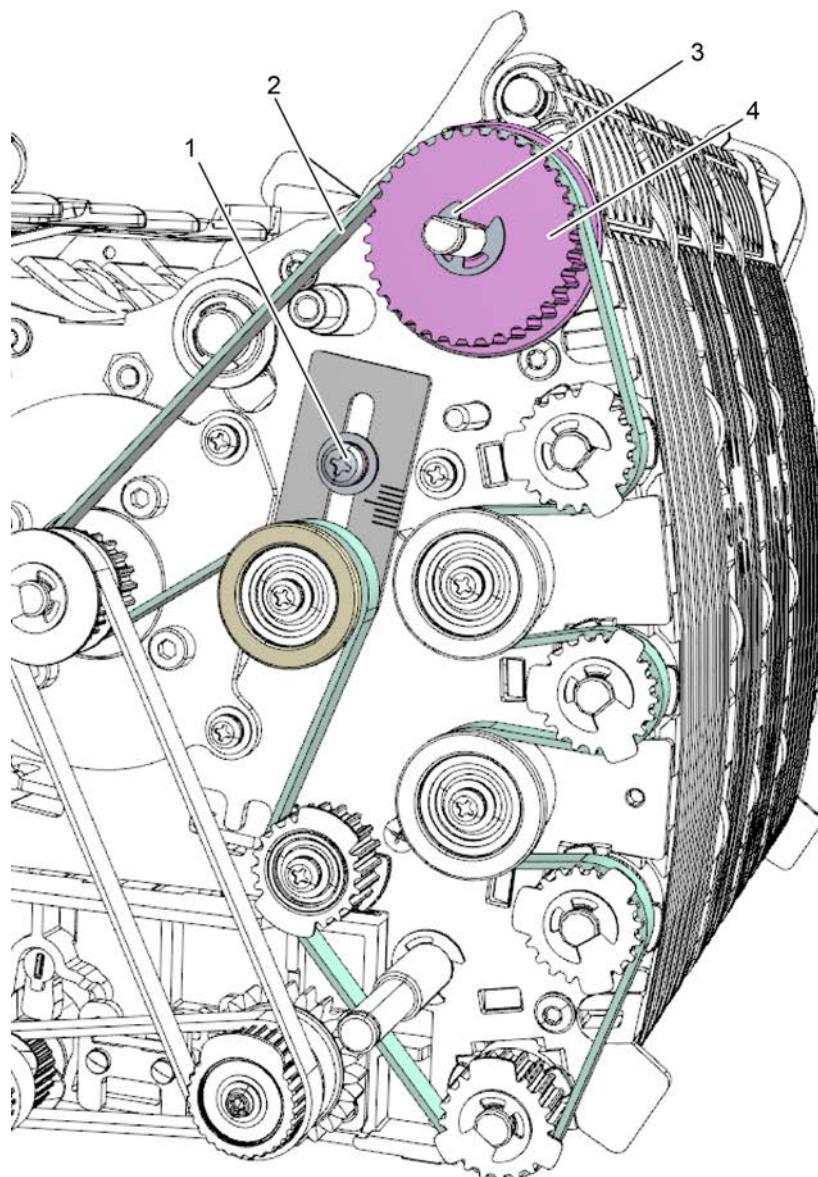
→ *Section 8.16.1 "Adjusting the Diverter Gate Gap", p. 112*

8.13 Removing the Drive Roller Assembly (35 D)

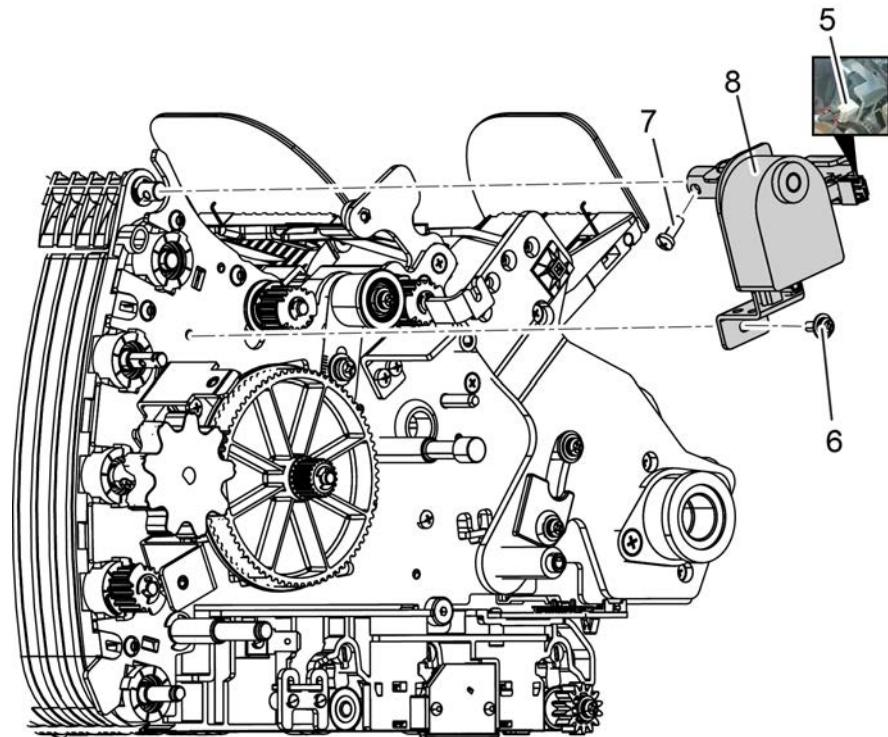
Requirements

- The mid covers (LHS and RHS) are removed.
→ *Section 8.3.7 "Removing the Mid Cover (LHS/RHS)", p. 44*

Procedure



- [1] Loosen the belt tensioner screw (1).
- [2] Dismount the belt ($L = 597 \text{ mm}$) (2).
- [3] Remove the circlip (3).
- [4] Remove the timing belt pulley (35 G) (4).



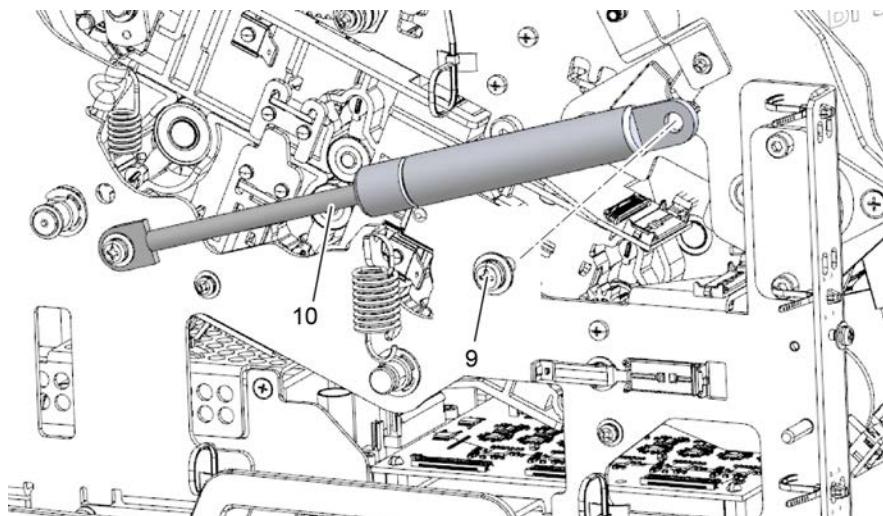
- 8**
- [5] Unplug the solenoid gate connector (5).
 - [6] Remove the screws (6) and (7).
 - [7] Remove the solenoid switch assembly (8).

**NOTICE**

Incorrect handling

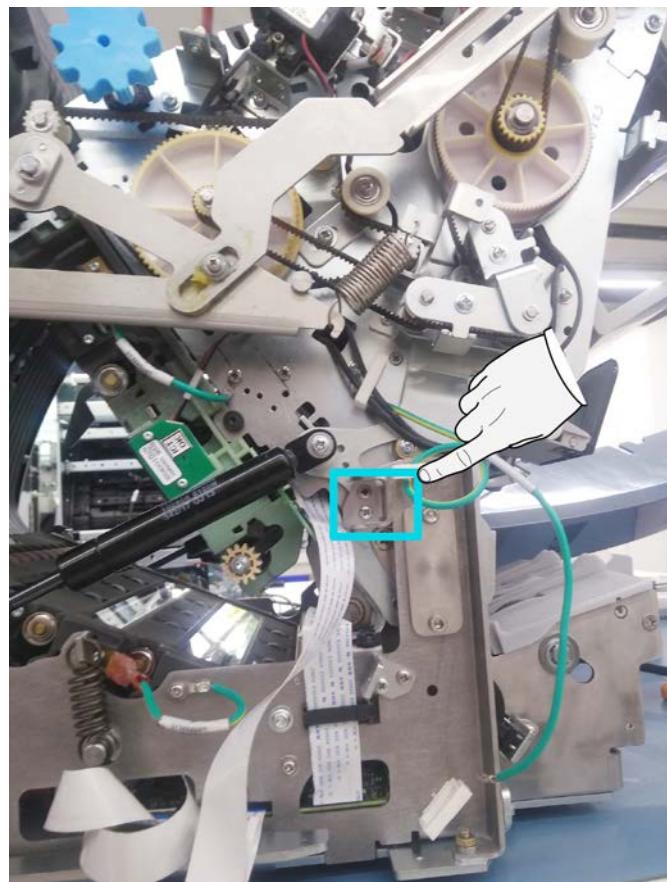
The BPS C2 may topple.

Support the front module properly.

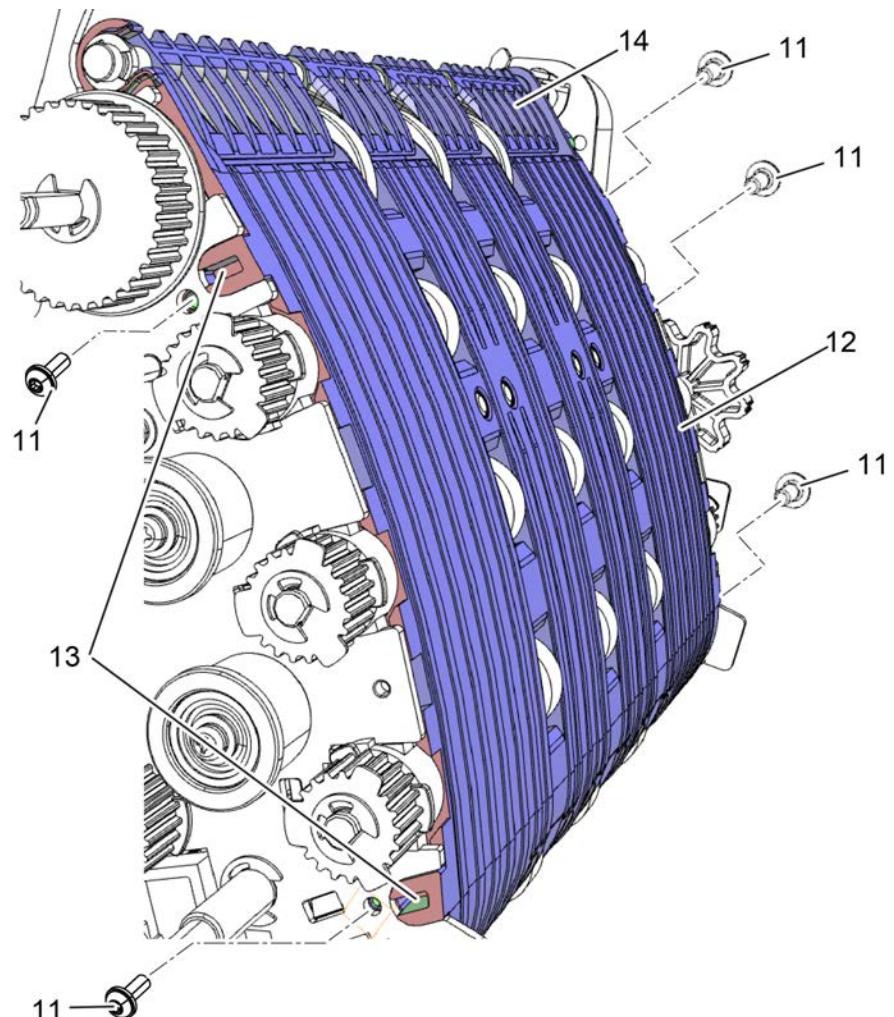


- [8] Remove the screw (9) on both sides.
- [9] Detach the pneumatic springs (10) on both sides.

8



- [10] Remove the screws and then remove the stopper brackets on both sides of the BPS C2.
- [11] Gently pull the front module forward to create gap for the guide plate removal.



[12] Remove the screws (11) on both sides.



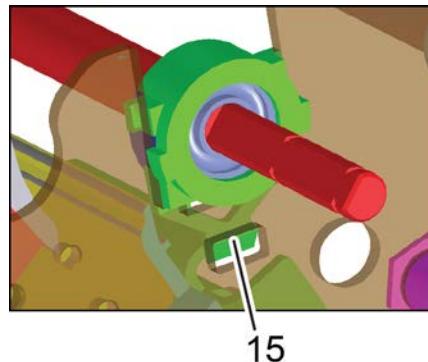
NOTICE

Incorrect Handling

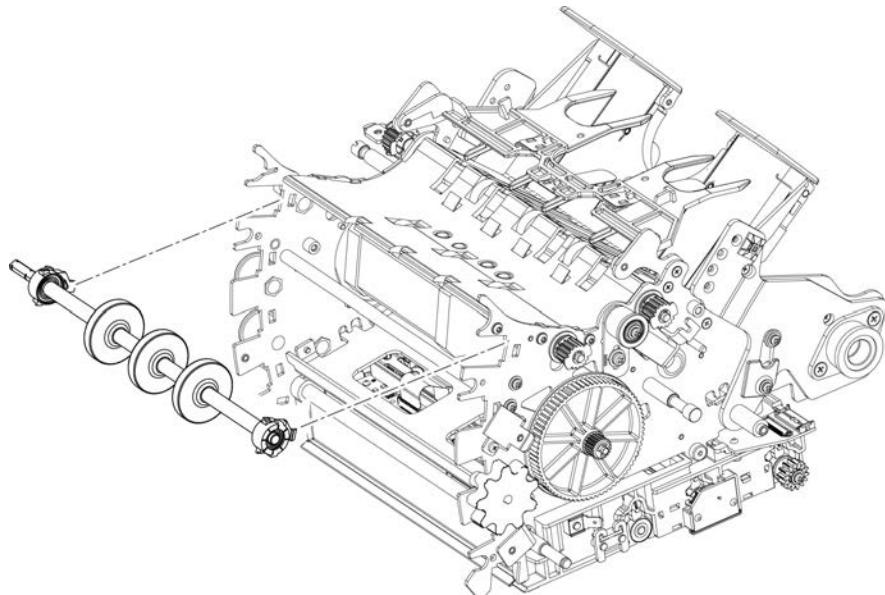
can cause damage to the guide plate assembly (12).

Pay attention to the bottom frame of the guide plate assembly (12) from removing.

[13] Using the flat screw driver in the slots (13), pull out the guide plate assembly (12) along with the diverter assembly (14) from the mid module.



- [14] Release the interlock (15) of the bearing case on both sides.



- [15] Remove the drive roller assembly (35 D) from the BPS C2.

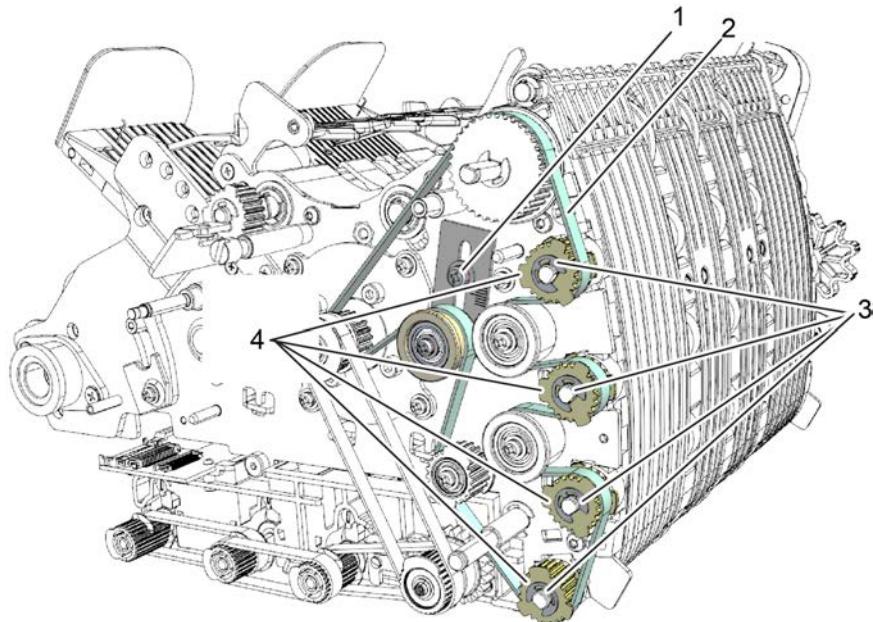
Result ⇒ The drive roller assembly (35 D) is removed.

8.14 Removing the Drive Roller Assembly (20 D)

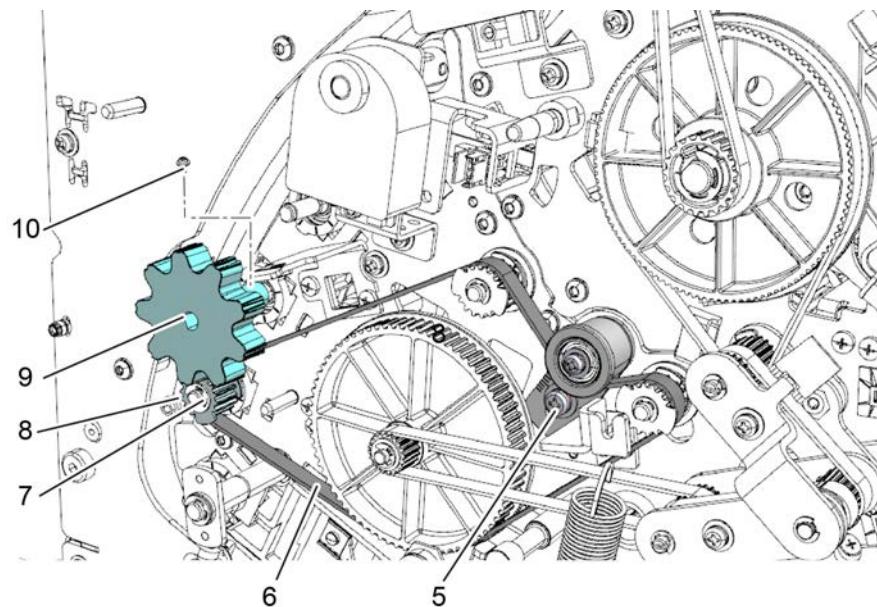
Requirements

- The BPS C2 opened.
- The mid covers on both sides are removed.
→ *Section 8.3.7 "Removing the Mid Cover (LHS/RHS)", p. 44*

Procedure

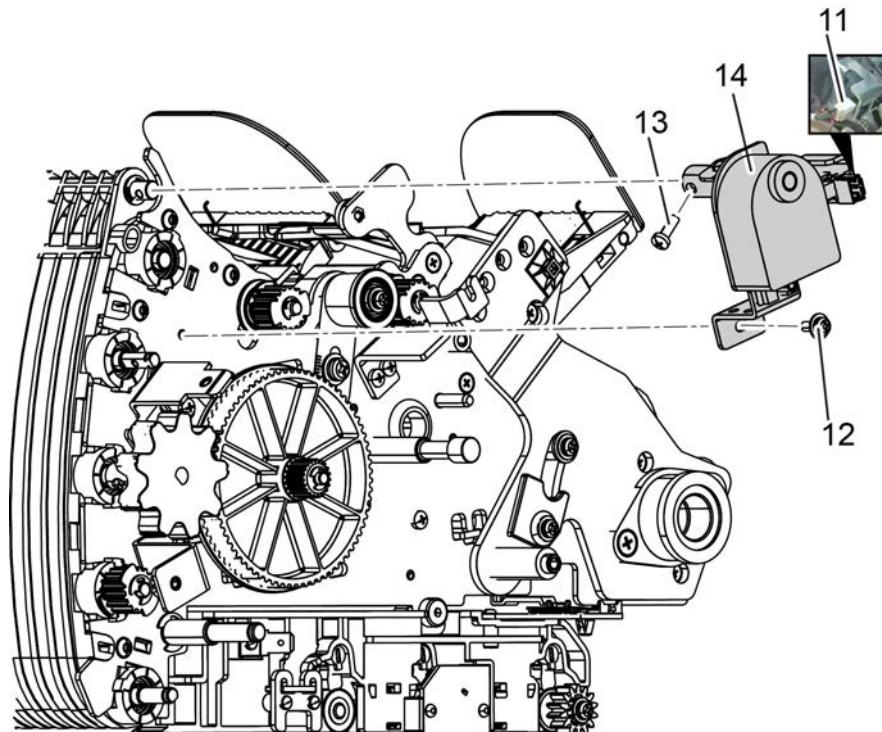


- [1] Loosen the belt tensioner screw (1).
- [2] Dismount the belt ($L = 597$ mm) (2).
- [3] Remove the circlips (3).
- [4] Remove the timing belt pulleys (20 G) (4).



- [5] Loosen the belt tensioner screw (5).

- [6] Dismount the belt ($L = 393$ mm) (6).
- [7] Remove the circlip (7).
- [8] Remove the timing belt pulley (8).
- [9] Remove the screw (10).
- [10] Remove the hand wheel (9).



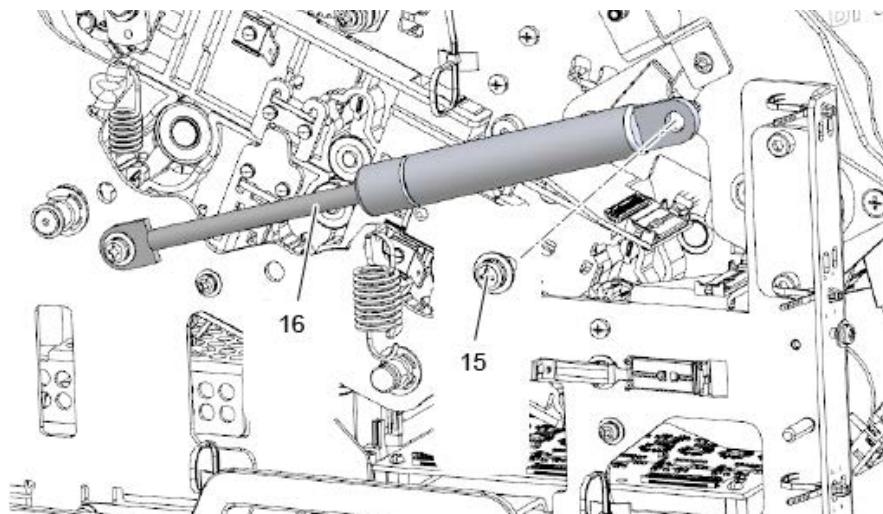
- [11] Unplug the solenoid gate connector (11).
- [12] Remove the screws (12) and (13).
- [13] Remove the solenoid assembly (14).

**NOTICE**

Incorrect handling

The BPS C2 may topple.

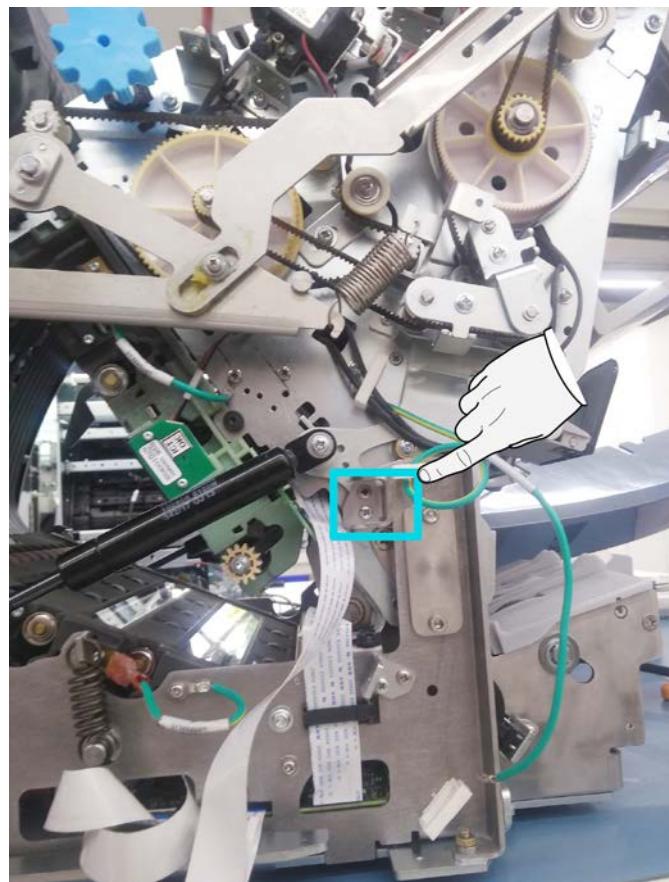
Support the front module properly.



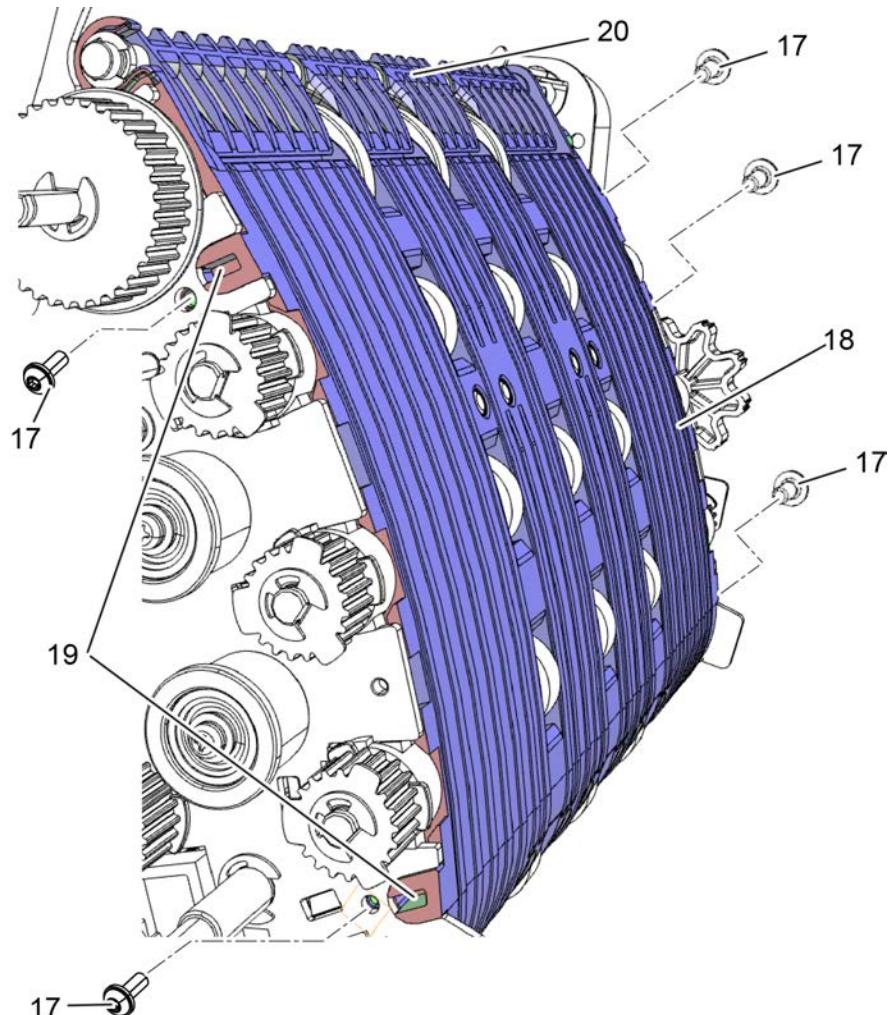
[14] Remove the screw (15) on both sides of the machine.

[15] Detach the pneumatic spring (16) on both sides.

8



- [16] Remove the screws and then remove the stopper brackets on both sides of the BPS C2.
- [17] Gently pull the front module forward to create gap for the guide plate assembly removal.



8

[18] Remove the screws (17) on both sides.



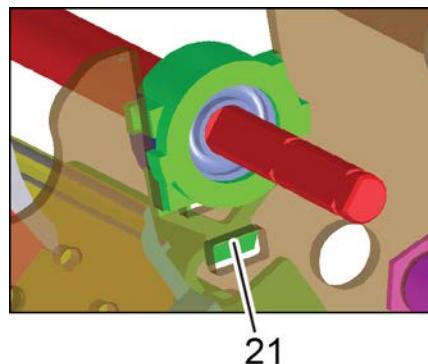
NOTICE

Incorrect Handling

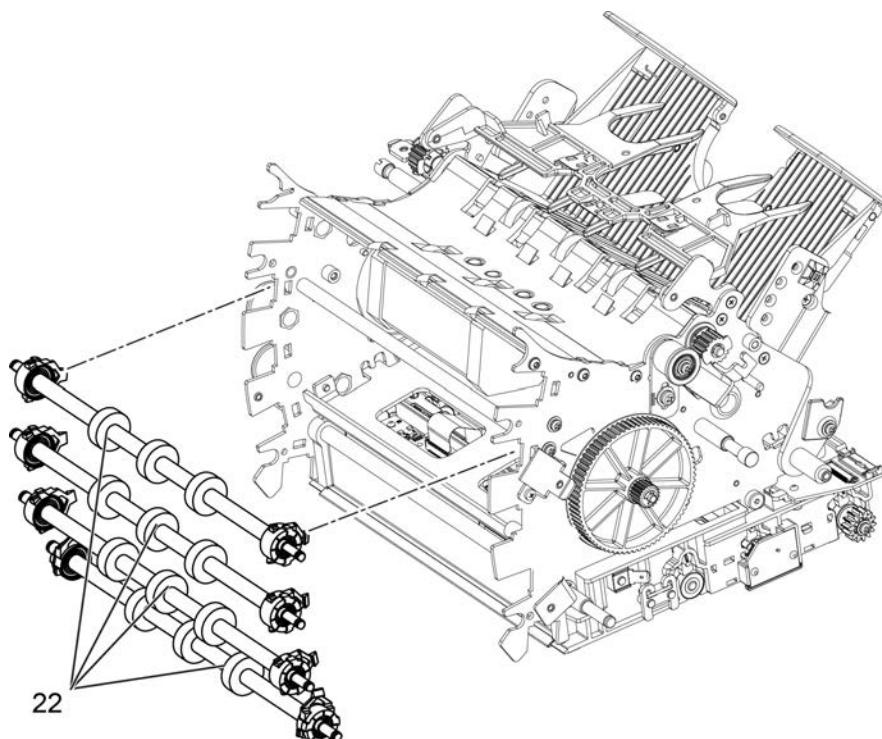
can cause damage to the guide plate assembly (18).

Pay attention to the bottom frame of the guide plate assembly (18) while removing.

[19] Using the flat screw driver in the slots (19), pull the guide plate assembly (18) along with the gate diverter (20) from the mid module.



- [20] Release the interlock (21) of the bearing case on both sides.



- [21] Remove the drive roller assembly (22) from the BPS C2.

Result ⇒ The drive roller assembly (20 D) is removed.

8.15 Replacing the PCB Main

The PCB Main is located at the bottom of the BPS C2.

The PCB Main consists of the following parts for replacement.

- Battery, 3V
- Fuse, 6.3A
- DP processor
- Sensor processor

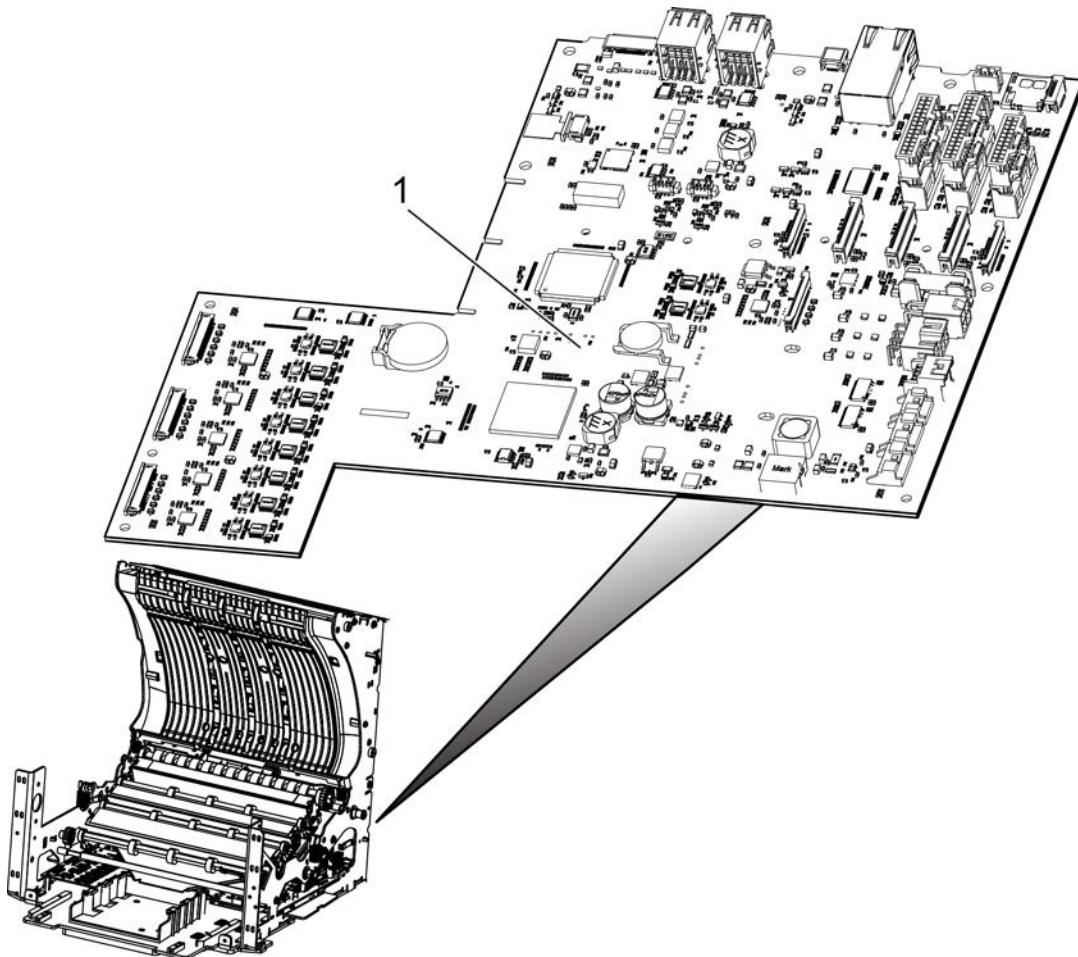


Figure 57: PCB Main Overview



Important!

For any above parts replacement (expect fuse), the PCB Main is removed from the BPS C2.

→ *Section 8.15.1 “Removing the PCB Main”, p. 108*

8.15.1 Removing the PCB Main

Requirements

- The power supply unit removed
→ *Section 8.5 “Replacing Parts in the Power Supply Assembly”, p. 66*
- The upper and lower rear covers removed.
→ *Section 8.3.10 “Removing the Upper Rear Cover”, p. 48*
→ *Section 8.3.11 “Removing the Lower Rear Cover”, p. 50*
- The front base covers (LHS and RHS) removed.
→ *Section 8.3.8 “Removing the Front Base Cover (LHS/RHS)”, p. 45*
- The upper and lower rear frames on sides removed.



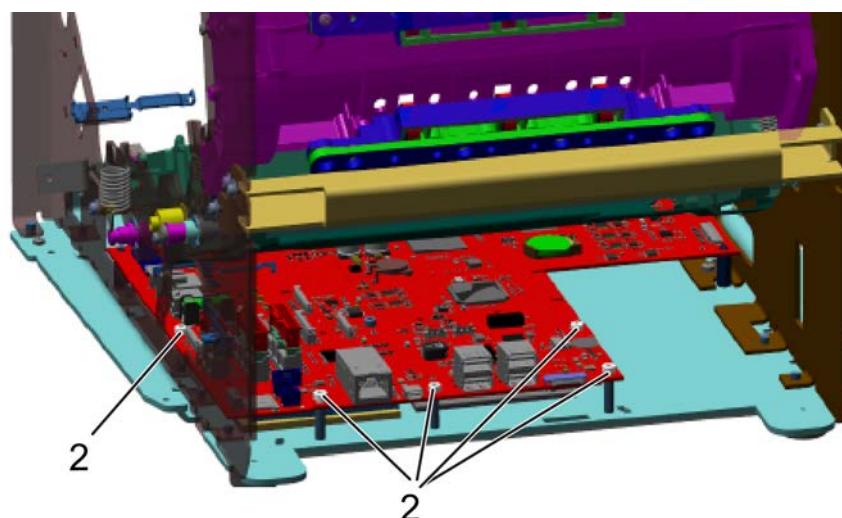
NOTICE

Incorrect handling
can cause damage to PCB Main.

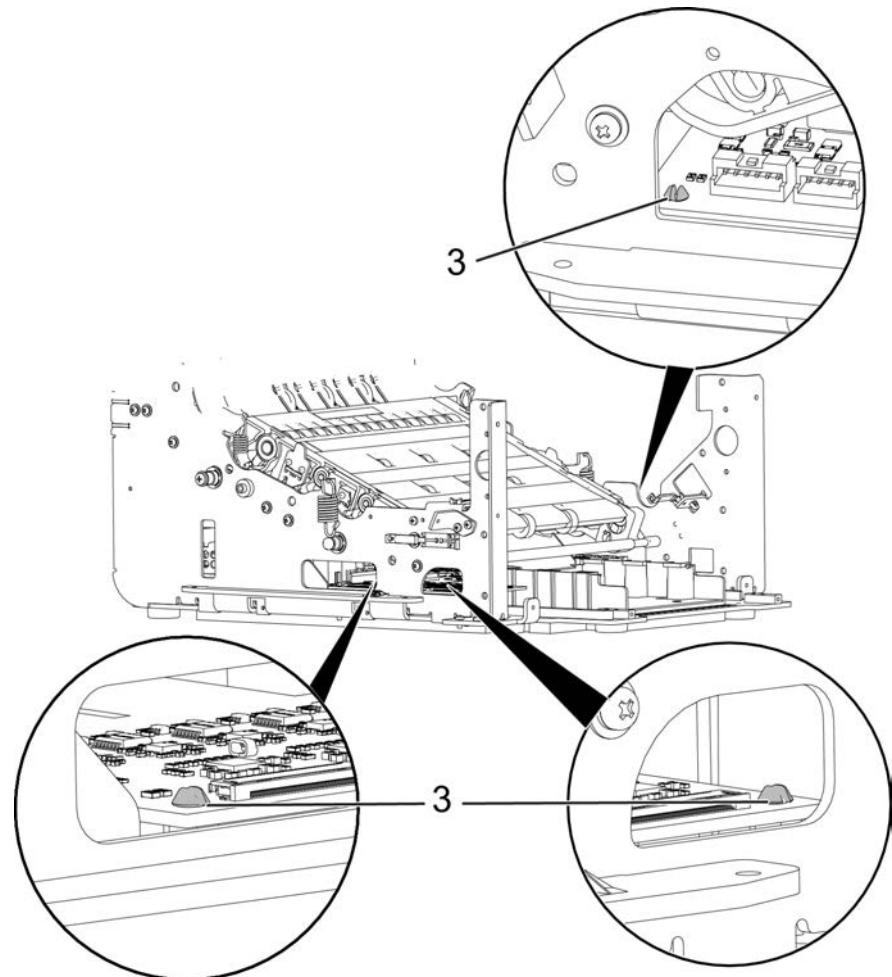
Ensure the capacitors on the PCB Main do not hit the frame, while removing.

Removing the PCB Main

- [1]** Remove all the connectors from the PCB Main.
→ *Chapter C “PCB Main Connectors Diagram”, p. 187*



- [2]** Remove the screws (2).



- [3] Lift the PCB Main to release from the stand-offs (3) (on both sides).
- [4] Slide and then remove the PCB Main from rear of the BPS C2.

Result ⇒ The PCB Main is removed.

8.15.2 Replacing the Processors

The processors (1, 2) are located the bottom of the PCB Main.

1. DP Processor
2. Sensor Processor

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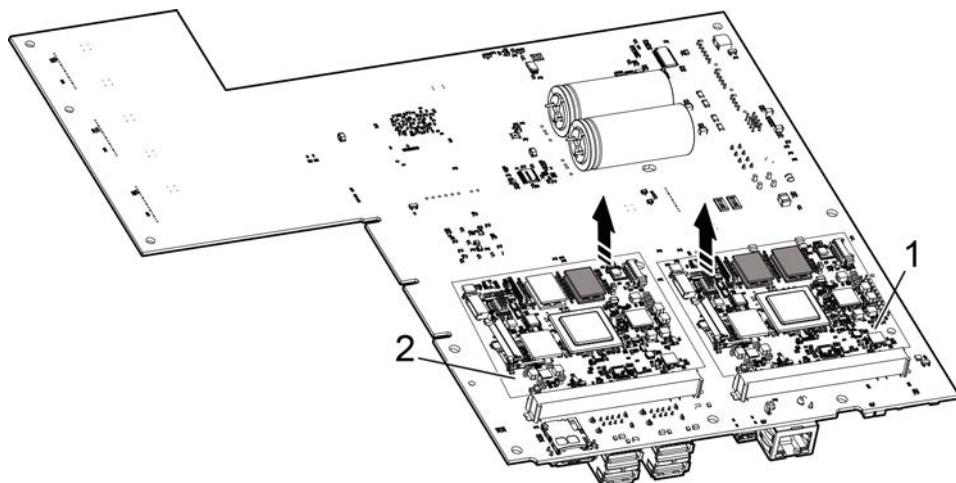


Figure 58: Processors Overview

Requirements

The PCB Main removed.

→ *Section 8.15.1 "Removing the PCB Main", p. 108*

**Important!**

Pay attention while lifting the processors from the stand-offs.

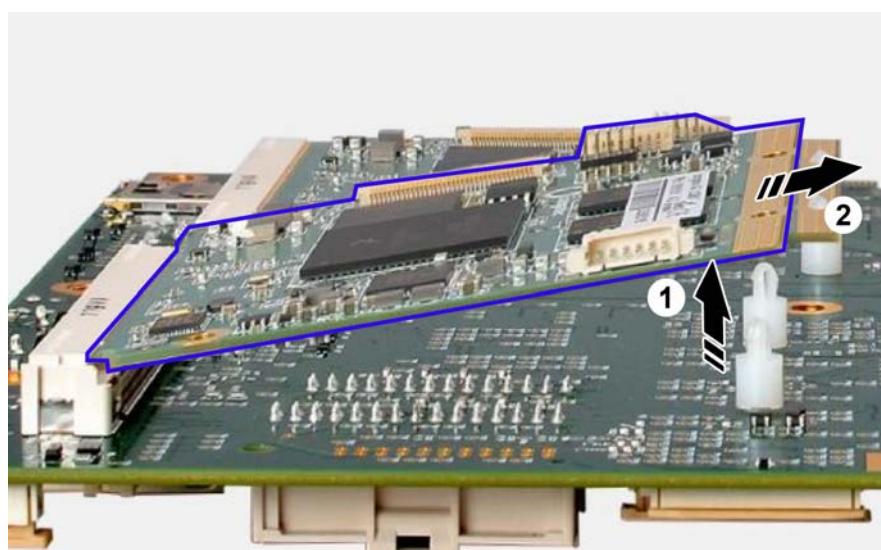


Figure 59: Processors Removal

Removing the Processors

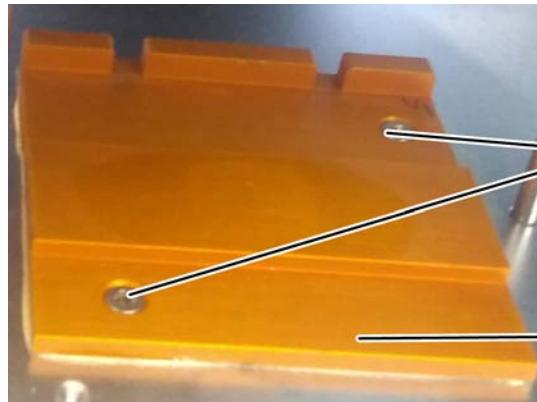
- [1] Lift the processors to release from the stand offs.
- [2] Slide and then remove the processors from the respective connectors.

Installing the DP Processor


Important!

Always install the new DP processor with the new heat sink provided.

Ensure that the backup data restore to the installed DP processor.



- [3] Remove the two screws (1) from the heat sink (2).
- [4] Remove the heat sink (2) from the base frame of the BPS C2 .



- [5] Using the screws (1), install the new assembled heat sink (3).
- [6] Peel off the cover (4) from the adhesive top.



[7] Install the DP processor on the PCB Main.

Installing the Sensor Processor

[8] Installation is in reverse order of removal.

Result ⇒ The processors are replaced.

8.16 System Adjustment

This chapter contains the following adjustment procedures:

- → *Section 8.16.1 “Adjusting the Diverter Gate Gap”, p. 112.*
- → *Section 8.16.2 “Adjust the Singler Gap ”, p. 115.*
- → *Section 8.16.3 “Adjusting the Retarding Wheels ”, p. 124.*
- → *Section 8.16.4 “Synchronizing the Singler Drum and the Hopper Wheels ”, p. 126.*

8.16.1 Adjusting the Diverter Gate Gap

You should maintain the following diverters gate gap.

- Reject gate gap - 2.5 mm
- Stacker 1 gate gap - 3 mm
- Stacker 2 gate gap - 3.5 mm
- Stacker 3 gate gap - 3.75 mm

The diverter gate gap adjustment is required when:

- There is banknote jam near the diverter gate
- Solenoid switch is removed/replaced.
→ *Section 8.12 “Replacing the Solenoid Switch”, p. 92*
- Banknote diverter gate is removed/replaced.

Requirements

- Slip Gauge
- Packet of banknotes

Procedure

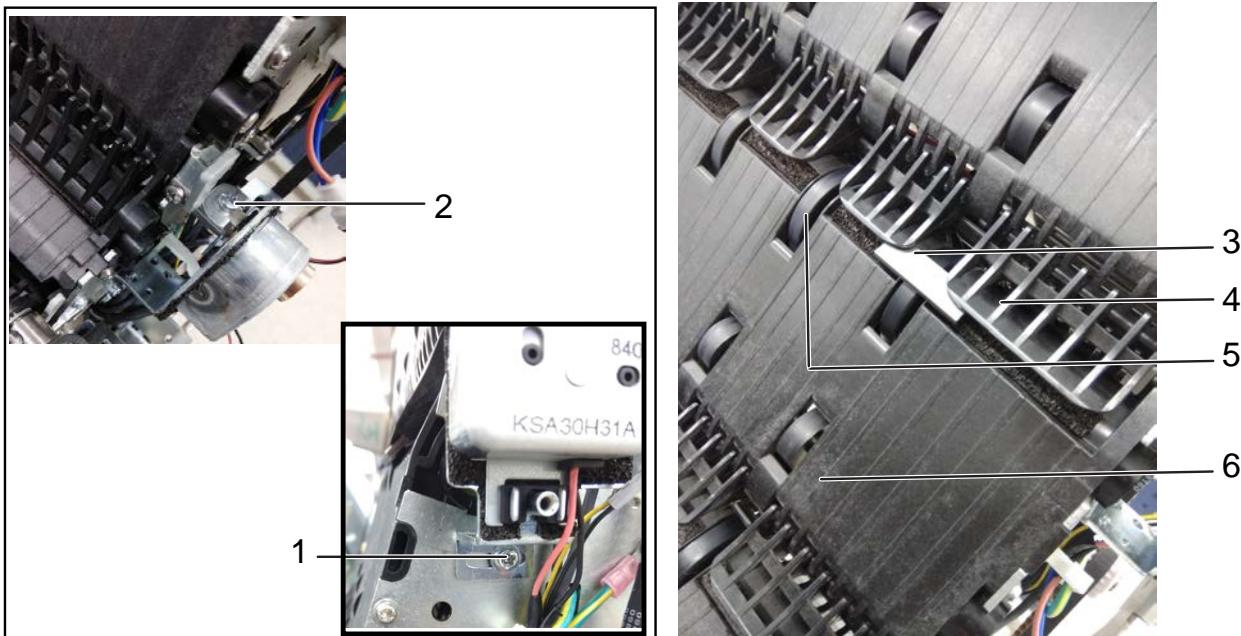


Figure 60: Diverter Gate Gap adjustment

8

- [1] Loosen the solenoid bracket screw (1).
- [2] Loosen the coupler screw (2).
- [3] Insert the slip gauge (3) inside and middle of the diverter gate (4).
Ensure that the required gap is maintained from the outer surface of the drive roller (5) to the tip of the diverter (4).
- [4] Close the diverter gate (4).
- [5] Tighten the solenoid bracket screw (1).
Tighten the coupler screw (2).
- [6] Remove the slip gauge.
- [7]
- Important!**
Ensure that the diverter gate is inside the guide plate (6).
Ensure that the diverter gate moves free without any stiffness.
- [8] Process the banknotes.

- Result ⇒ If no banknote jam occurs, the diverter gate gap adjustment is complete.
 If banknote jam occurs, perform fine adjustment of the gate.
 → *Section 8.16.1.1 "Fine adjusting the Gate Gap", p. 114*

8.16.1.1 Fine adjusting the Gate Gap

- Requirements
- The Diverter gate adjusted
 → *Section 8.16.1 "Adjusting the Diverter Gate Gap", p. 112*
 - Packet of banknotes

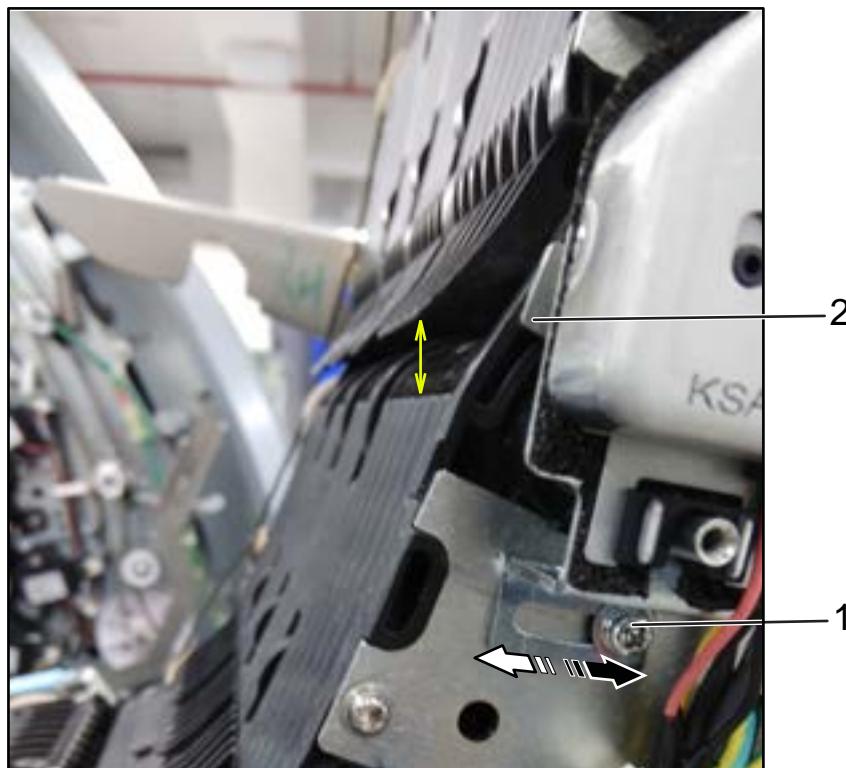


Figure 61: Gap Adjustment

- [1] Loosen the solenoid bracket screw (1) and coupler screw (2).
- [2] Adjust the diverter gate gap by moving the solenoid switch bracket in clockwise or anticlockwise direction.
- [3] Tighten the screws (1, 2).
- [4] Process the banknotes.
- [5] Repeat the step 1 to step 4, until there is no banknote jam.

- Result ⇒ The diverter gate gap is fine adjusted.

8.16.2 Adjust the Singler Gap

Singler gap to be adjusted for the following reasons: Height rejection rate due to:

- Skew
- Closed feed
- Missed feed
- Uneven wear of certain spare parts

Therefore, various adjustments must be made in the singler area to resolve the above problems.

Singler must also be adjusted when you:

- Check/replace spare parts in the singler area as part of the regular maintenance work.

8.16.2.1 Verifying the Singler Adjustment Status

This procedure shows the process to verify the singler adjustment status.

Requirements

- Service login.
→ *Section 9.2 "Logging in as Service", p. 130*
- 100 to 200 used banknotes
Make sure that the banknotes are not torn or taped.
- The Banknotes should be well mixed in all four orientations

Procedure

[1] Select .

[2] Select the **997** OP mode.

[3] Insert 100 to 200 used banknotes into the singler.



Important!

Make sure that the banknotes are not torn, taped or its corners are folded.

The Banknotes should be well mixed in all four orientations.

⇒ The banknotes are singled and sorted into the relevant stacker.

[4] Select .

[5]

Select the  tab.

⇒ The **Health** displays the singler health (number of rejects due to closed feed and multiple feed).

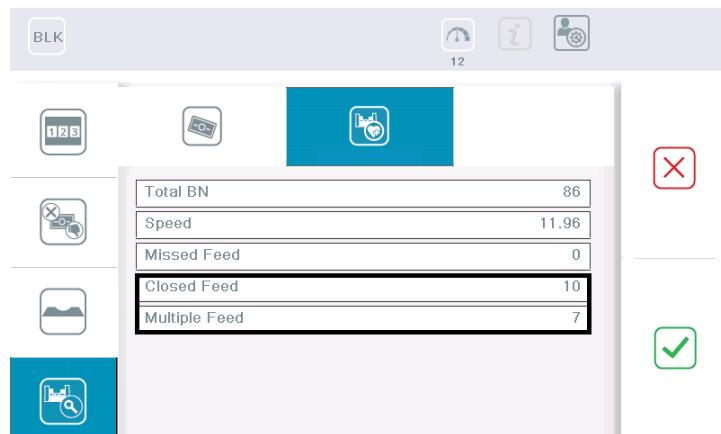


Figure 62: Singler Health View

If the closed feed, multiple feed and the missed feed count is higher than the acceptable range, perform basic adjustments of the singler → *Section 8.16.2.3 "Adjustments Via Singler Health Option", p. 117.*

[6]

Select the  tab.

⇒ The **Skew** displays the magnitude and direction of angle of Banknotes entering the sensor for authentication.

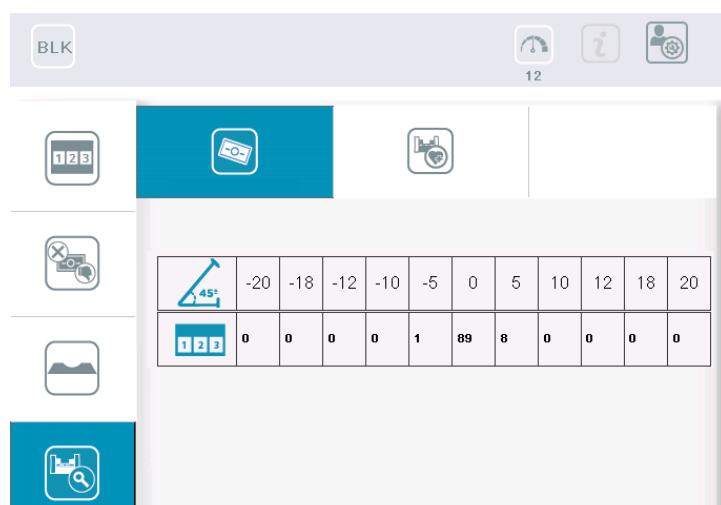


Figure 63: Singler Skew view

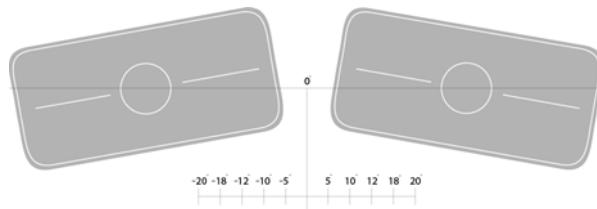


Figure 64: Skew Measurement

The permissible limit of skew is ± 10 degrees.

To adjust the skew, perform fine adjustments of the singler → *Section 8.16.2.5 “Fine Adjustments of the Singler”, p. 122.*

8.16.2.2 Basic Adjustments of the Singler

The gap between the singler drum and the retarding rollers should be set equal to the thickness of one banknote so that the singler allows only one banknote to pass through it without any resistance. If the gap is not set properly, rejects due to closed feed or multiple feed are increased.

Singler gap	Reject reasons
More	Closed feed and multiple items
Less	Missed feed

The singler gap can be set:

- Via singler health option
- Via spring scale

8.16.2.3 Adjustments Via Singler Health Option

This procedure shows how to set the singler gap via singler health option.

Requirements

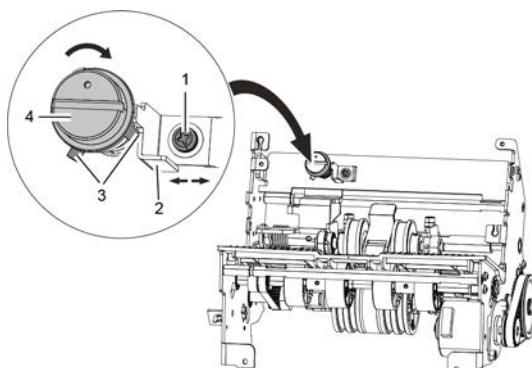
- The BPS C2 is switched on.
→ *Section 8.2.1 “Switching the BPS C2 ON/OFF”, p. 34*
- Axial adjustment of the retarding wheels assembly is complete.
→ *Section 8.16.3.1 “Axial Adjustment of the Retarding Wheels”, p. 124*
- Retarding wheels symmetry is adjusted.
→ *Section 8.16.3.2 “Adjusting the Retarding Wheel Symmetry”, p. 125*
- Singler drum and the hopper wheels is synchronized.
→ *Section 8.16.4 “Synchronizing the Singler Drum and the Hopper Wheels”, p. 126*
- Service login.
→ *Section 9.2 “Logging in as Service”, p. 130*
- 100 to 200 used banknotes

Procedure

- [1] Process the banknotes that are not torn or taped.
- [2] See the result to check the singler adjustment status.
→ *Section 8.16.2.1 “Verifying the Singler Adjustment Status”, p. 115*
- [3] Reduce the singler gap if the closed feed and the multiple feed are high.
- [4] Increase the singler gap if the missed feed is high.

Singler Adjustment Screw Rotation	Result
Clockwise	Increased singler gap
Counterclockwise	Reduced singler gap

Adjusting the Stopper



If the needed position of the singler adjustment screw is outside of the range allowed by the grub screws, adjust the stopper.

- [4-1] Loosen the screw (1).
- [4-2] Move the stopper (2) to your right.
- [4-3] Tighten the screw (1).



Important!

Make sure to clear the previous deposit so that the rejects are reset to zero.

⇒ The stopper is adjusted.

- [5] Insert the banknotes into the singler and repeat → [1] to → [4] until the rejects due to closed feed and multiple feed are almost zero.
- Make sure to use the same banknotes as before.



Important!

If the singler gap is reduced to more than required, there will be an increase in missed feed count and hence affecting the productivity.

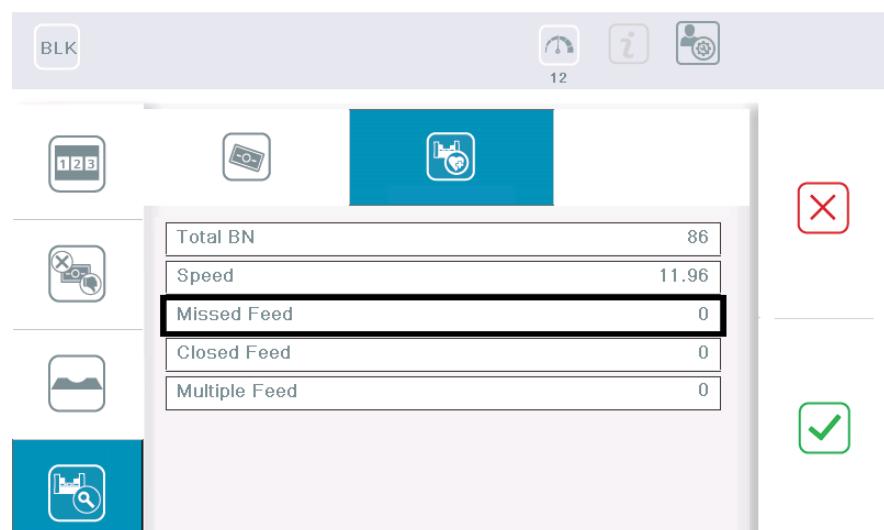


Figure 65: Singler View

Positioning the Singler Adjustment Screw

After the singler is set properly, reposition the singler adjustment screw to 12 O' clock position.

- [5-1] Loosen the two grub screws (3).

Result

- [5-2] Rotate the singler adjustment screw (4) until the indentation (a dot) is in 12 O' clock position.
- [5-3] Tighten the two grub screws (3).
- ⇒ The singler adjustment screw is positioned.
- ⇒ Basic adjustments of the singler via singler health option is complete.

8.16.2.4 Adjustments Using Spring Scale

This procedure shows how to set the singler gap using spring scale.

Requirements

- Axial adjustment of the retarding wheels assembly is complete.
→ *Section 8.16.3.1 “Axial Adjustment of the Retarding Wheels”, p. 124*
- Retarding wheels symmetry is adjusted.
→ *Section 8.16.3.2 “Adjusting the Retarding Wheel Symmetry”, p. 125*
- Singler drum and the hopper wheels is synchronized.
→ *Section 8.16.4 “Synchronizing the Singler Drum and the Hopper Wheels”, p. 126*
- The BPS C2 is not in any banknote processing mode.
- Print fresh quality banknotes

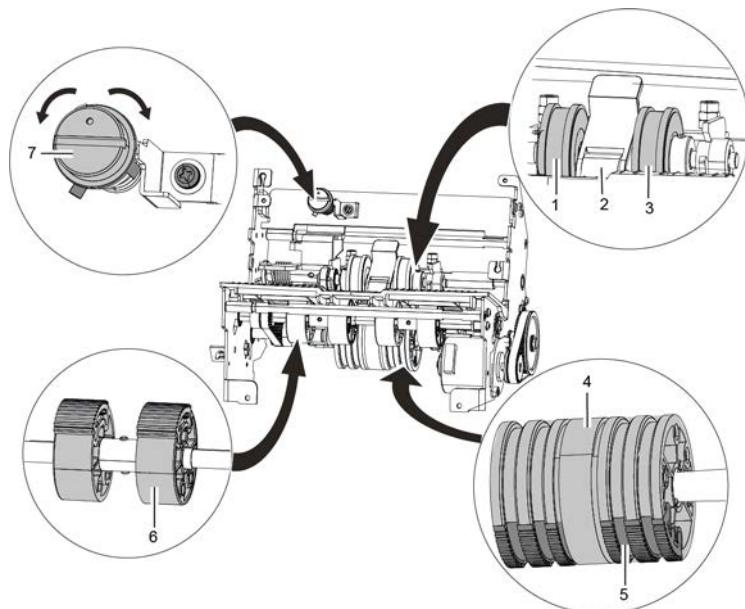


Figure 66: Basic Adjustments of the Singler

Procedure

- [1] Attach a print fresh quality banknote to a spring scale.
- [2] Rotate the hopper wheels assembly (6) to position the friction element (5) on the singler drum (4) away from the retarding wheel (1).
- [3] Insert the banknote into the singler (between the left side of the retarding wheel (1) and the singler drum (4)).
- [4] Rotate the hopper wheels assembly (6) in forward direction so that the banknote is pulled between the friction element (5) and the retarding wheel (1).



Important!

Make sure that:

- The banknote does not reach the presser roller (2) and the pinch roller (located at the back of the retarding wheel).
- The Banknote covers the entire width of the friction element (5).

- [5] Hold the hopper wheels assembly (6) to restrict the rotation of the singler drum assembly (4).
- [6] Drag the spring scale.
- [7] Note down the reading on the spring scale when the banknote is just about to slip.



Important!

The spring scale should read between 1.0 and 1.5 N at both retarding wheels for effective singling of banknotes.

- [8] Rotate the singler adjustment screw (7) to achieve the required frictional force.

Singler Adjustment Screw Rotation	Result
Clockwise	Reduced frictional force
Counterclockwise	Increased frictional force

- [9] Perform the same activity with the retarding roller on the right side and note down the spring scale reading.

**Important!**

The force achieved at the retarding roller on the right should be same as that of the retarding roller on the left side.

Result

⇒ Basic adjustments of the singler via singler spring scale is complete.

**Important!**

If there is a variation in the force achieved at the retarding rollers, the singler needs fine adjustments.

8.16.2.5 Fine Adjustments of the Singler

Fine adjustment of the singler is required if the gap between the retarding rollers (right and left) and the singler drum are not equal.

This difference in gap produces skew during the singling of banknotes.

Start this activity with the retarding roller which has greater frictional force.

Requirements

- Axial adjustment of the retarding wheels assembly is complete.
→ *Section 8.16.3.1 “Axial Adjustment of the Retarding Wheels”, p. 124*
- Retarding wheels symmetry is adjusted.
→ *Section 8.16.3.2 “Adjusting the Retarding Wheel Symmetry”, p. 125*
- Singler drum and the hopper wheels is synchronized.
→ *Section 8.16.4 “Synchronizing the Singler Drum and the Hopper Wheels”, p. 126*
- Forces at the retarding rollers is checked.
→ *Section 8.16.2.4 “Adjustments Using Spring Scale”, p. 120*

Procedure

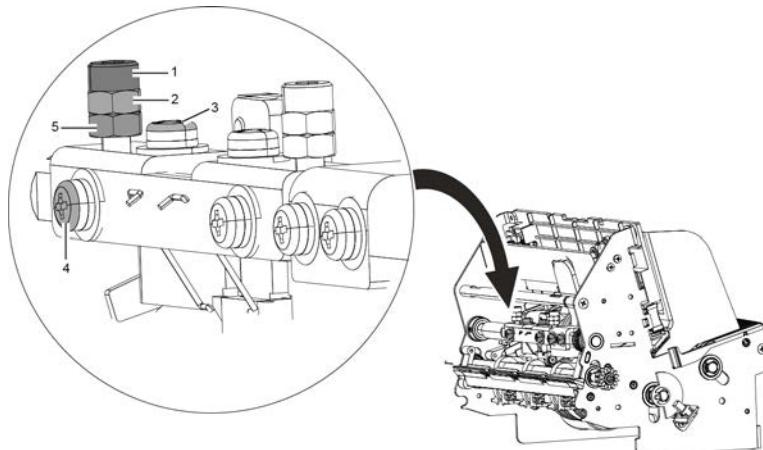


Figure 67: Fine Adjustments



Important!

Start the adjustments with the retarding wheel having greater frictional force.

- [1] Loosen the locknut (2) and (5) holding the screw (1) with an allen key from top.
- [2] Rotate the screw (1) clockwise 2 to 5 degrees depending on the frictional force variation.



Important!

Screw rotation must be limited to multiples of 2 to 5 degrees.

- [3] Check the frictional force again using spring scale.

- [4] Repeat steps → [2] to → [3] until the frictional force is equal at the retarding roller on the other side.

If the required frictional force is achieved

- [5] Hold the screw (1) with an allen key and tighten the locknut (5).

- [6] Tighten the locknut (2).

Result ⇒ Fine adjustment of the singler is complete.

8.16.3 Adjusting the Retarding Wheels

8.16.3.1 Axial Adjustment of the Retarding Wheels

This adjustment is made in the retarding wheels assembly to restrict axial movement of the retarding rollers along its shaft to 0.1 mm.

Requirements

- The singler module is removed from BPS C2.
→ *Section 8.4.1 "Removing the Singler Module", p. 52.*
- Feeler gauge of 0.1 mm.

Procedure

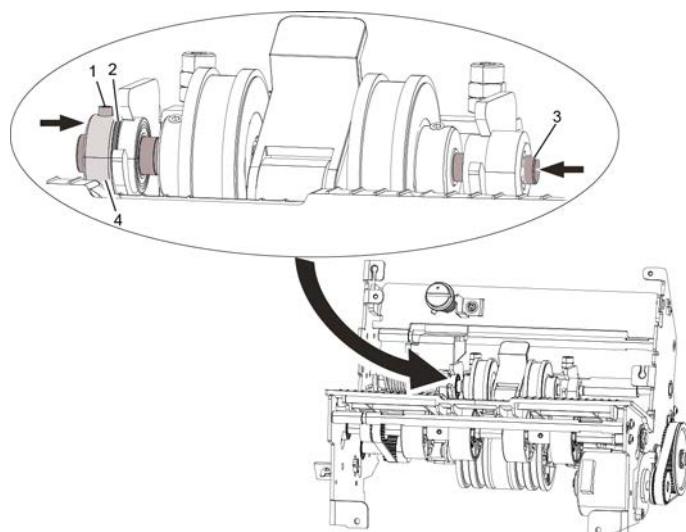


Figure 68: Axial Adjustment

- [1] Loosen the grub screw (1).
- [2] Insert a feeler gauge of 0.1 mm between the brass collar (4) and the washer (2).
- [3] Press gently the brass collar (4) and the retarding wheel shaft (3) together.
- [4] Tighten the grub screw (1).

- [5] Remove the feeler gauge from the singler area.
- [6] Repeat step → [2] and check if a gap of 0.1 mm is maintained between the brass collar (4) and the washer (2).

If the axial movement of the retarding wheels is not 0.1 mm

- [7] Repeat steps → [1] to → [6].

Result ⇒ Axial adjustment of the retarding wheels is complete.

8.16.3.2 Adjusting the Retarding Wheel Symmetry

This adjustment is made in the retarding wheels assembly to set symmetry of the retarding rollers to the singler drum.

Requirements

- The singler module is removed from BPS C2.
→ *Section 8.4.1 "Removing the Singler Module", p. 52.*
- Axial movement of the retarding wheels is restricted to 0.1 mm.
→ *Section 8.16.3.1 "Axial Adjustment of the Retarding Wheels ", p. 124.*

Procedure

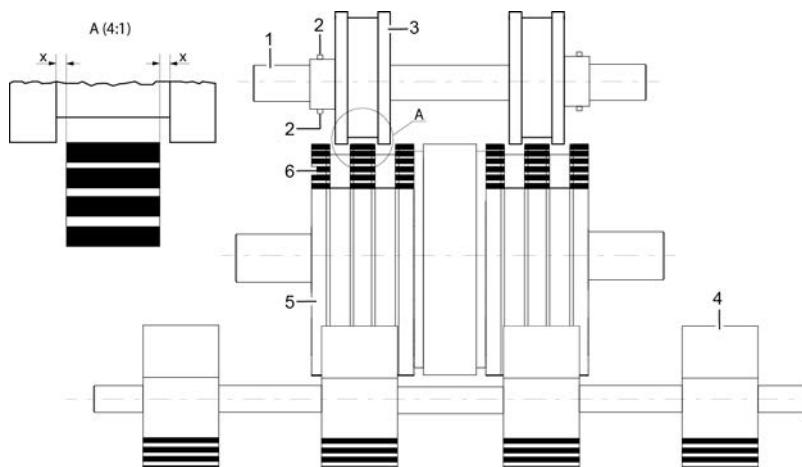


Figure 69: Setting the Retarding Wheels Symmetry

- [1] Rotate the hopper wheels (4) such that the friction elements (6) of the singler drum (5) are facing the retarding roller (3).
- [2] Check if the gaps (X) are equal.

If the gaps (X) are not equal

- [3] Loosen the two grub screws (2).
- [4] Shift the retarding roller (3) along the shaft (1) until the gaps (X) are equal.
- [5] Tighten the two grub screws (2).

If the gaps (X) are equal

- [6] Perform the same activity with the other side of the retarding wheel.

Result

- ⇒ Symmetry of the retarding wheels is set.

8.16.4 Synchronizing the Singler Drum and the Hopper Wheels

Synchronization of the singler drum and the hopper wheels is necessary for efficient singling of banknotes.

Asynchronous rotation of the singler drum and the hopper wheels results in missed feed.

Requirements

- The singler module is removed from BPS C2.

→ *Section 8.4.1 "Removing the Singler Module", p. 52.*

Removing the Belt

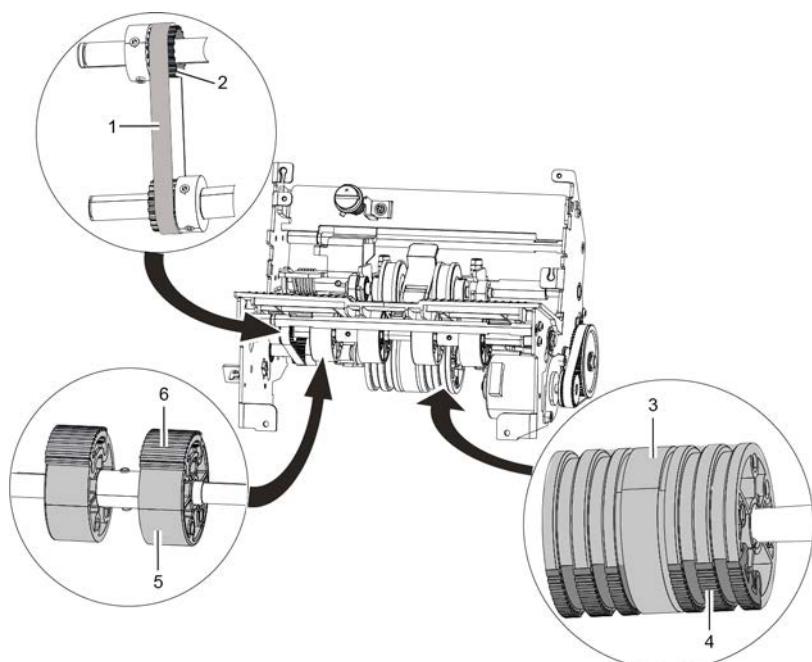
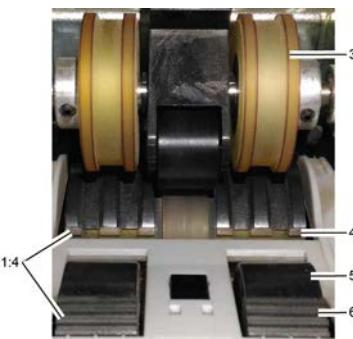


Figure 70: Removing the Belt

- [1] Remove the toothed belt (1) from the toothed belt wheel (2).

Singler Drum and Hopper Wheels Ratio

- [2] Adjust by rotating the singler drum (3) and the hopper wheels (5) to 1:4 ratio.



Singler drum	First row of the friction element (4) is visible.
Hopper wheels	First four rows of the friction elements (6) are visible.

- [3] Hold the singler drum (3) and the hopper wheels (5) with one hand.
- [4] Mount the toothed belt (1) onto the toothed belt wheel (2).
- [5] Check if the synchronization of the singler drum and the hopper wheels is not disturbed.
- [6] If the synchronization is disturbed, repeat steps → [1] to → [4] until correct ratio of the wheels is achieved.
- Result ⇒ Synchronization of the singler drum and the hopper wheels is complete.

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9 Software

This section describes the service functions of the BPS C2 that can be accessed via the service menu.

The service menu provides options to test various functional units directly, and acts as an interface for starting service and diagnostic functions.

9.1 User Interface

The BPS C2 has three user types:

- Operator:
Performs banknote processing and related operations.
- Supervisor:
Performs various system administration operations.
- Service:
Performs the service-related tasks.

When you start the BPS C2, the login screen is launched.

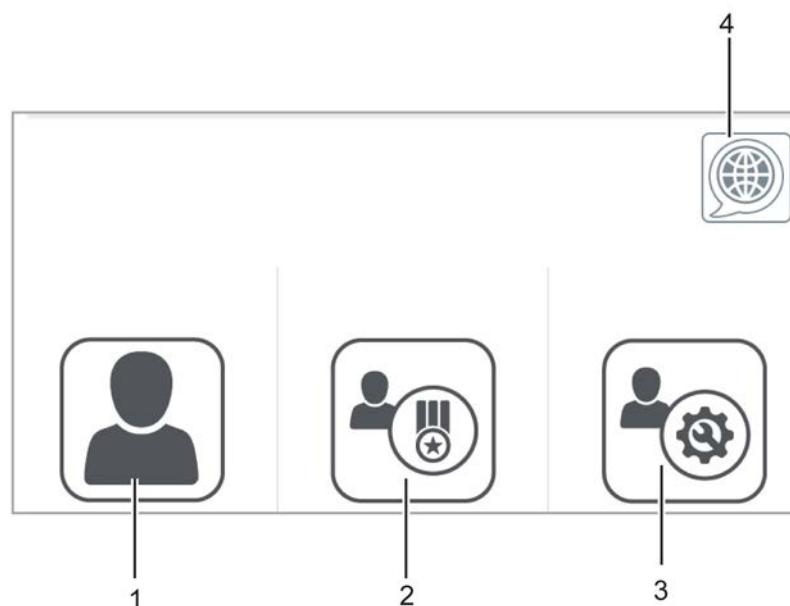


Figure 71: Main Screen

- 1 Operator
To log in as an operator.
- 2 Supervisor Mode
To log in as a supervisor.

- 3 Service Mode
To log in as service engineer.
- 4 Language
To set the language.

An overview of all the symbols can be found in the Appendix.
→ *Chapter F “Symbols Used”, p. 205*

9.2 Logging in as Service

You must be logged in as service to carry out any service-related tasks. There is only one service ID set up in the default configuration. The default PIN for service login is 2001.

When you select the service login, you are prompted to enter your service PIN.

Only one user may be logged in to the BPS C2 at any time. If an operator is logged in, then first close all deposits and log off as an operator.

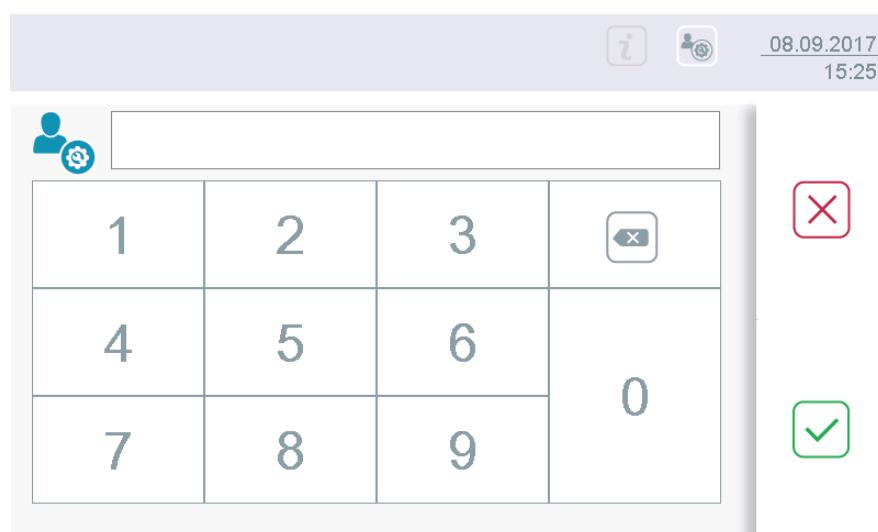
This procedure shows how to log in as a service engineer.

Requirement

- The BPS C2 is switched on.

Procedure

- [1] In the login screen, select .



- [2] Enter the service PIN.

[3] Select 

Result

⇒ You have successfully logged in to service.

9.3 Service Menu



NOTICE

Risk of loss of data or settings

In the service menu, improper use can result in loss of data or settings.

Work secure and follow the instructions properly.

In the service menu, there are three screens with the following menu options. You can scroll from one screen to another by swiping.

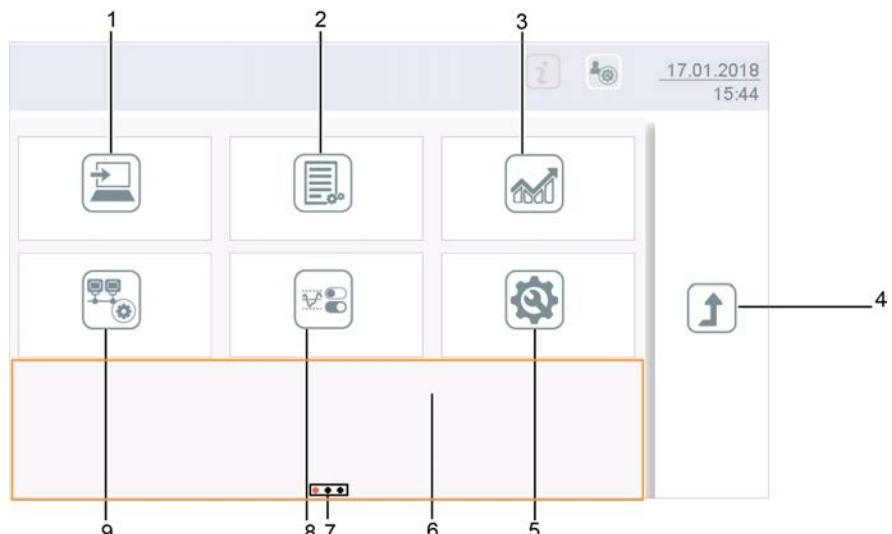


Figure 72: Service Menu Screen 1

1 Software Versions

Displays the software version.

2 Reporting

Prints report or transfers reports to FTP or USB stick.

3 Operation Details

Displays various operation details.

4 Back

Navigates to the login screen.

5 Service OPmode

Interfaces various service and diagnostic functions.

- 6 Swipe area
Scrolls from one screen to another.
- 7 Screen indicator
Indicates the screen when scrolling from one screen to another. The red dot indicates the current screen status.
- 8 Fitness Threshold Settings
Sets the sorting thresholds for fitness sorting.
- 9 IRT Settings
Configures the IP address of the IRT server.

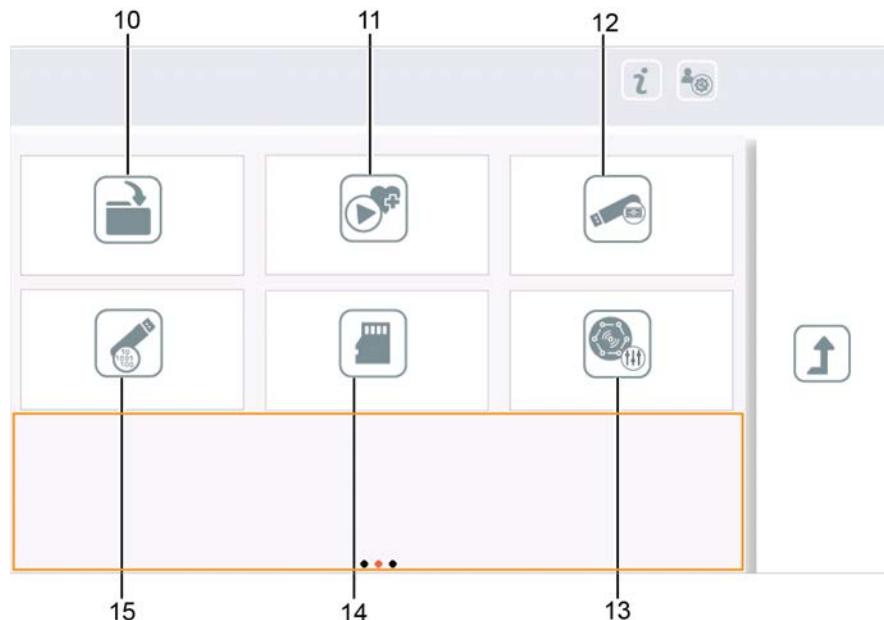


Figure 73: Service Menu Screen 2

- 10 SW Update
Updates/install the software, configuration package, or language software.
- 11 System Test
Checks the health of the machine components.
- 12 Dump logs
Creates troubleshooting traces and logs, and transfers the logs to a USB stick.
- 13 Self-Test Level Setting
Sets the self-test level.
- 14 SD Backup
Takes date backup on SD card.

15 Export Raw data

Exports raw data of the last 100 processed banknotes to the USB stick.

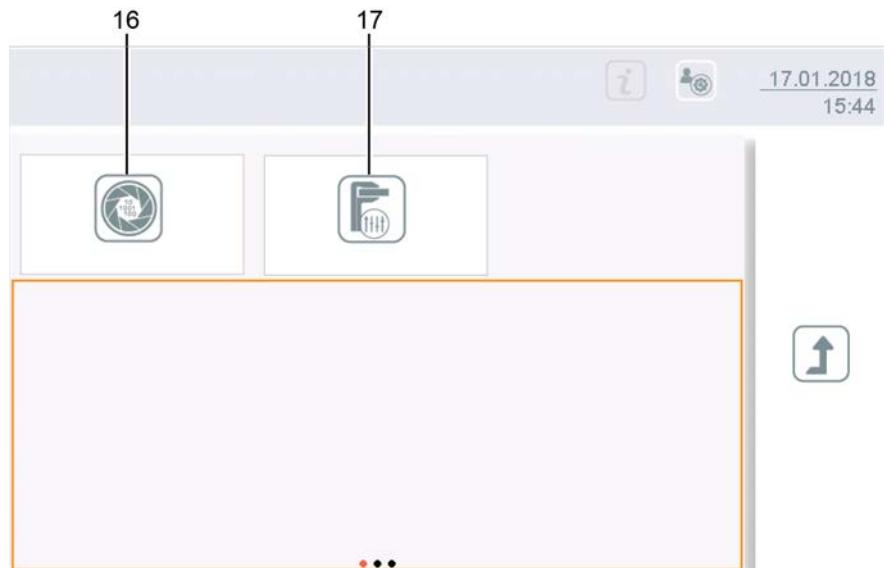


Figure 74: Service Menu Screen 3

16 Raw Data Capturing

Connects IRT to capture raw data of a particular currency.

17 MTS Calibration Update

Updates the calibration file after MTS calibration.

18 Trace Level Setting

Sets the trace level parameters.

9.4 Service OP Modes

The  menu provides the following options:

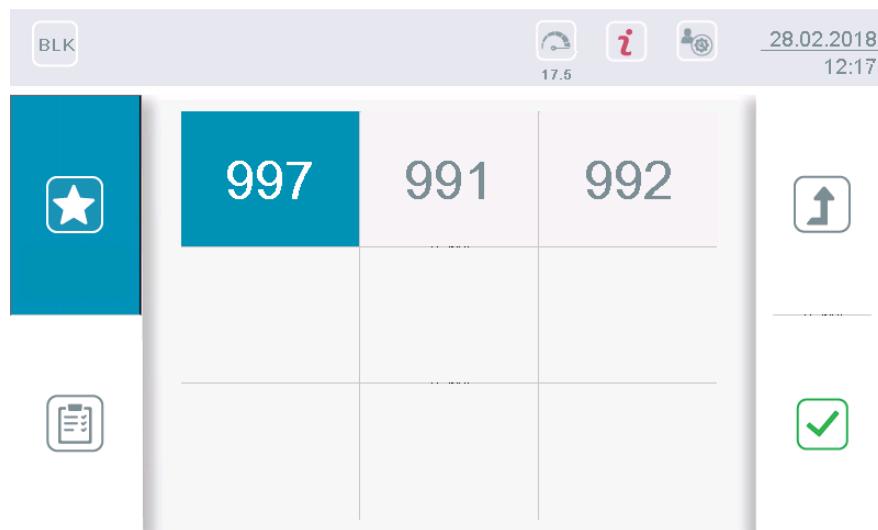


Figure 75: Service OP Modes

OP Code	Operation	Description
997	Service Mode	Process the document to check the transport and singler health status → <i>Section 9.8 “Testing the BPS C2 Transport and Singler Health”, p. 139</i>
991	MTS Calibration Mode	Process the MTS calibration media to calibrate the MTS sensor. → <i>Section 9.9 “Calibrating the Sensor - MTS (Mechanical Thickness Sensor)”, p. 142</i>
992	Sensor Functional Test	Process the sensor function test media (FUKO) to sensors functional test. → <i>Section 9.10 “Testing the Sensor (Functional Test)”, p. 144</i>

9.5 Viewing the Software Version Details

You can view the software versions details of the installed components.

This procedure shows how to view the software versions.

Requirements

- Operator or Supervisor login
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

- [1] Select 

Result

⇒ The software version details are displayed.

1	DP S/W	00.25.03
2	DP OS	00.09.17
3	DP db	1.0.0
4	MC S/W	0.13.18.4
5	Sensor S/W	00.16.00
6	FPGA	0.1.0
7	Boot - Loader	0.1.0
8	Configuration Package	Config_Package_Release_V16.0
9	LanguagePackageVersion	01.00.00
10	CNY Version	01.04.000
	BL Version	00.12.000

Figure 76: Software Version

- 1 Software version
- 2 Operating system version
- 3 Database version
- 4 Machine control software version
- 5 Sensor software version
- 6 Field programmable gate array software version
- 7 Boot-Loader version
- 8 Configuration package version
- 9 Language package version
- 10 Currency version

Use the scroll bar to view the version information of rest of the currencies.

9.6 Printing/Sending/Copying Reports

In the appendix, you can find an overview of all available reports.

→ *Chapter E “Reports”, p. 201*

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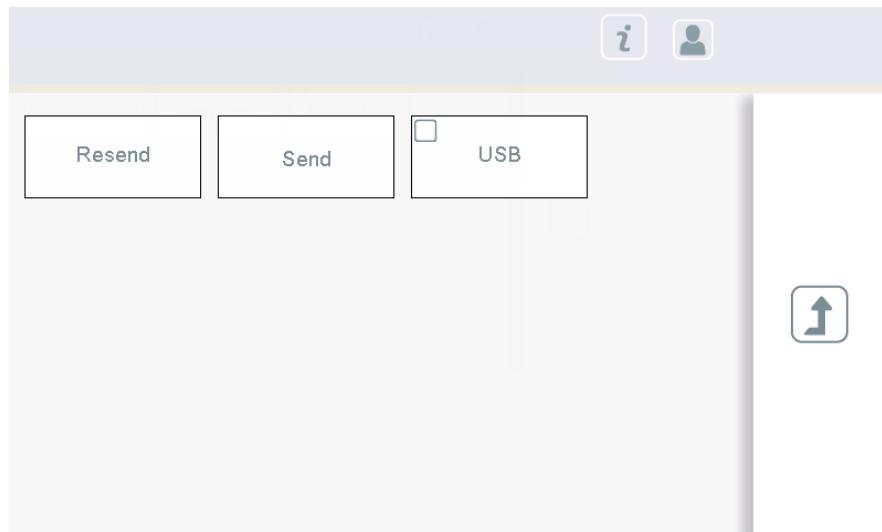


Figure 77: Reporting Menu

The **Reporting** menu provides the following options:

- Print/Send: The **Send** menu option provides the list of reports, which are triggered by a user request. You can print the reports manually.
- Reprint/Resend: The **Resend** menu option provides the list of reports, which have been already printed/sent to any target or missed in printing/sending due to the mis-communication or any other reason. You can print/send the reports again from here.

The list of available reports in the above menu options depends upon the configuration settings.

- Copy to USB: The **USB** menu option allows you to copy any report to the USB stick. Use this option if you have not configured the USB target for reports, and you need a report in USB. A copy of the reports are copied in the *copy to USB* folder of the USB drive.

You can print the result of banknote processing in report form or send the report to any target. There are two printing/sending options.

Automatic Printing/ Sending

You can set the target and trigger for the reports via the BPS Eco Configurator tool in your configuration package. The report is delivered through printer, USB or FTP automatically.

Manual Printing/Send- ing

You can also print/send the report manually. When you set the trigger as user request, you must print/send report manually.

The list of printable reports for a particular user depends upon the configuration settings.

9.6.1 Manually Printing/ Sending Reports

This procedure shows how to print/send manually.

Requirements

- Printer connected
- FTP address configured

Procedure

- [1] Log in.
→ *Section 9.2 “Logging in as Service”, p. 130*
- [2] Select 
- [3] Select **Send**.
- [4] Select the desired report.
- [5] Select 

Result

⇒ The report is printed/sent.

9.6.2 Reprinting/Re-sending Reports

This procedure shows how to reprint/resend reports.

Requirements

- Printer is connected
- FTP is configured

9

Procedure

- [1] Log in.
→ *Section 9.2 “Logging in as Service”, p. 130*
- [2] Select 
- [3] Select **Resend**.
- [4] Select the desired report.
- [5] Select 

Result

⇒ The report is reprinted/resent.

9.6.3 Copying Reports to USB Stick

This procedure shows how to enable the copy reports to USB stick function.

Requirements

- The USB stick is plugged into the BPS C2.

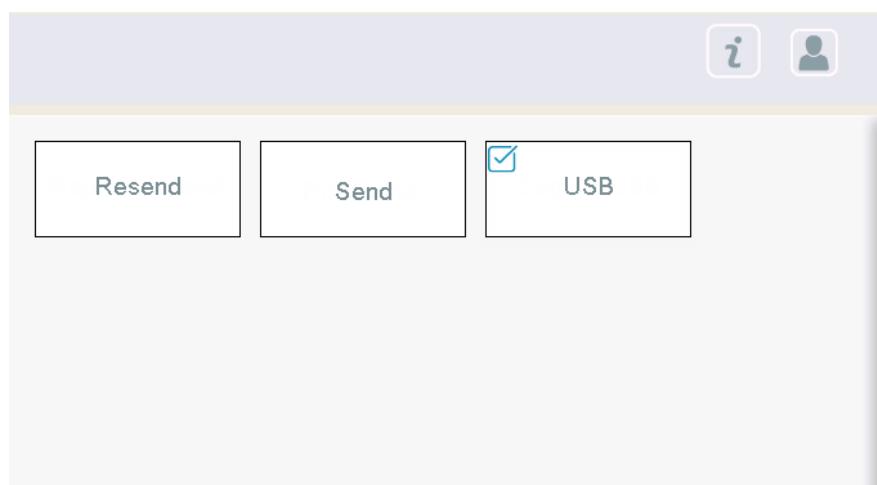
Procedure

- [1] Log in.

→ *Section 9.2 “Logging in as Service”, p. 130*

- [2] Select .

- [3] Check the **USB** check box.



- [4] Select .

Result

- ⇒ You have successfully enabled the Copy to USB function.
A copy of the configured report is copied to the USB stick.

9.7 Viewing Operation Details

You can view the details of various operations to understand the system info, health, life, and performance. This procedure shows how to view operation details.

Requirements

- Supervisor login
- Service login

→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

[1] Select 

Result

⇒ The following screen displays the operation details.



Figure 78: Operation Details Screen

Scroll down the screen for more operation details.

Select the  button to reset the resettable values.

9.8 Testing the BPS C2 Transport and Singler Health

9

You can process the blank banknotes to test the BPS C2 transport and the singler heath status using the **Service** menu.

The BPS C2 transport and the singler health status is usually tested after any preventative maintenance task.

The BPS C2 takes the format and thickness of the first singled banknote as reference. The banknotes are sorted alternately to the delivery stackers.

The banknotes, which do not match the reference, are sorted to the reject stacker.

The OP mode **997** is used.

This procedure shows how to test the BPS C2 transport and singler health.

Requirements

- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*
- Blank banknotes

Procedure

- [1] Select .
- [2] Select the **997** OP mode.
- [3] Insert the blank banknotes into the singler.
 ⇒ The blank banknotes are singled and sorted in the delivery stackers 1 and 2.
 The **Summary** view displays the count of the sorted banknotes.
- [4] Select .
- ⇒ The **Reject** view displays the reject reasons.
 If the banknotes are rejected for any reason, other than **Configuration**, the mechanical properties and the sensor health should be analyzed.
- [5] Select .
- ⇒ The **Stackers** view displays the number of banknotes in each delivery stacker for the current accounting, and the total number of banknotes in each delivery stacker.
- [6] Select .
- ⇒ The  tab displays details on skew and health of the singler.

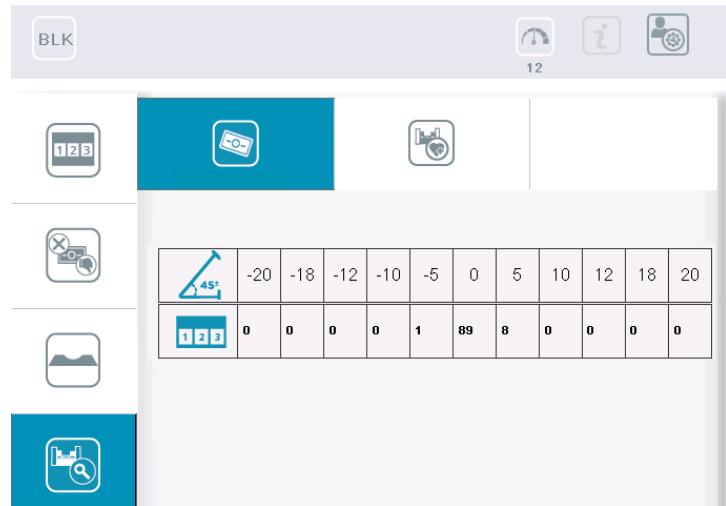


Figure 79: Skew View

+ indicates clockwise skew.

- indicates anticlockwise skew.

The acceptable range of skew is +10 to -10. However, the number of banknotes should be higher around 0 degrees to indicate that the singler is set correctly.

[7]



⇒ The **Health** tab displays the singler health details.

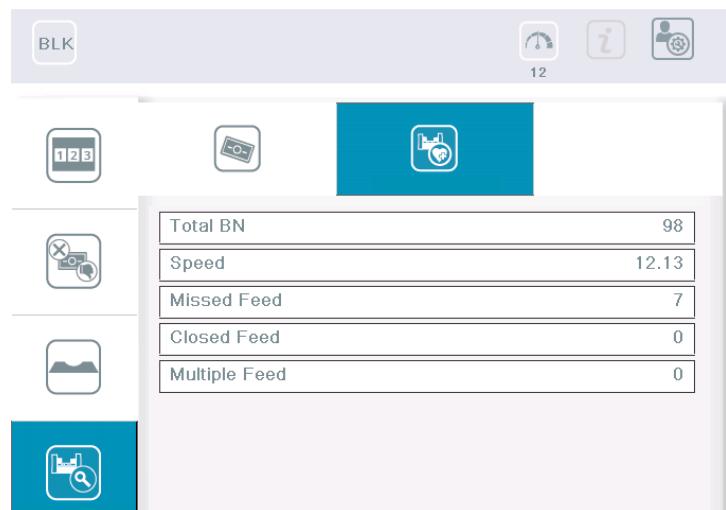


Figure 80: Singler Health View

The higher number of closed feed, missed feed, and multiple feed rejects indicate that the singler is not adjusted correctly.

→ *Section 8.16.2 “Adjust the Singler Gap”, p. 115*

Result ⇒ The transport and singler health properties are tested.

9.9 Calibrating the Sensor - MTS (Mechanical Thickness Sensor)

The MTS (mechanical thickness sensor) of the BPS C2 can be calibrated in the field using the service OP mode **991** and the **MTS Cal Install** menu option.

You should perform MTS calibration after changing any parts related to the MTS sensors.

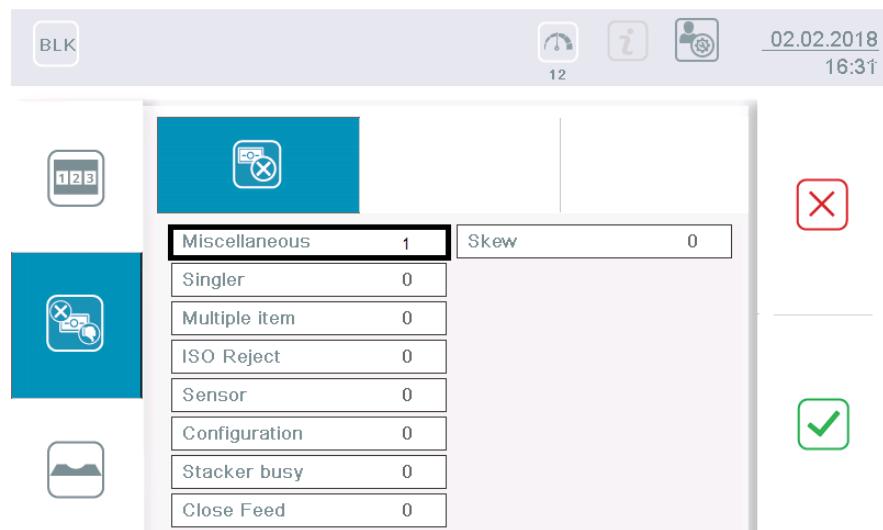
This procedure shows how to calibrate the MTS.

Requirements

- PC with administrative rights
- The BPS C2 switched on
- USB stick
- Calfilebuilder demo tool installed on the PC
→ *Section 8.1.1 “Software Tools”, p. 31*
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*
- MTS Calibration document (Art.-No.: 514867001)

Generating Raw Data for MTS Calibration Media

- [1]** Select 
- [2]** Select the **991** OP mode.
- [3]** Insert one calibration document into the singler.
The document is processed and sent to the reject stacker.
The result is displayed.

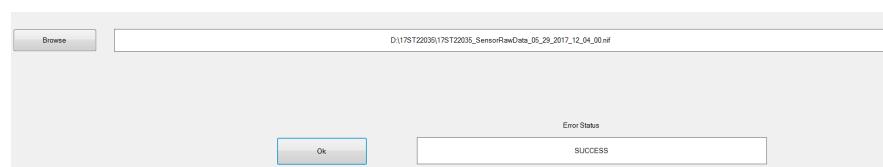


- [4] Select the  tab.
 The reject reason must be miscellaneous.
 If the reject reason is not miscellaneous, repeat → [3].
- [5] Remove the calibration document from the reject stacker.
- [6] Select .
- [7] Export the raw data for calibration.
 → *Section 9.17 “Exporting Raw Data”, p. 165*
 ⇒ The raw data are copied to the USB drive as a .nif file.

9

Generating the MTS Calibration File in the PC

- [8] Connect the USB stick to the PC.
- [9] Run MTSCalFileBuilder_v1.0.1.exe on your PC.
- [10] Select **Browse** and navigate to the .nif file from the USB drive.



- [11] Select **OK**.
 ⇒ The calibration file (.cal) file is generated in the USB drive.

- [12] Create a folder that is named MTSCalibration in the USB drive and place the .cal file in that folder.

Uploading the Calibration File in the BPS C2

- [13] Connect the same USB stick to the BPS C2.

- [14] In the service menu, select .

- [15] Select the relevant calibration file.

- [16] Select .

Result

⇒ The MTS is calibrated. The following message is displayed:

MTS File upload successful

9.10 Testing the Sensor (Functional Test)

You can test the status and functionality of the sensors using the **Sensor Function Test** menu to check the sensor health status.

The sensor functional test is performed in any of the following scenarios:

- Sensor calibration
- Sensor calibration error
- Sensor replacement
- High sensor rejection rate
- Any other sensor related issues

The .nif file, that is created during sensor function test, is used for the sensor analysis.

This procedure shows how to perform sensor function test.

Requirements

- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*
- Function test document (CALIBRATION SHEET, Art.-No.: 514869001)
- USB stick connected of the BPS C2
- PC with administrative right
- FUKO report analyzer tool installed in the PC
→ *Section 8.1.1 “Software Tools”, p. 31*

Procedure

- [1] Select .
- [2] Select the **992** OP mode.
- [3] Insert the calibration sheet precisely into the singler making sure that there is no skew.
The function test document is processed and stacked the delivery stacker1.
If the calibration sheet is rejected, then repeat → [2] with a new calibration sheet.
- [4] Select .
- [5] Remove the document from the stacker to close the deposit.
- [6] Select .
⇒ The sensor function test data is sent to the USB as *.nif* file.
- [7] Remove the USB from the BPS C2.
- [8] Connect the USB to the PC.
- [9] Run the *FUKO REPORT ANALYSER\FUKOReportAnalyser\FUKO_report_analyser.exe*.
- [10] Browse to the sensor function test data *.nif* file in the USB drive.

Result

- ⇒ If the sensor function test is successful, the message is displayed.



Figure 81: Function Test

If the test is unsuccessful, the failure causes are listed.

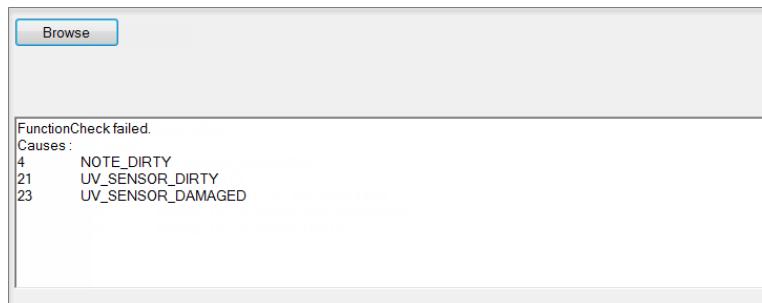


Figure 82: Function Test Failure

If the failure cause is listed as sensor damage, replace the sensor.

9.11 Switching On/Off the Authenticity Features

You can switch on/off any of the following security/ authenticity features for any particular denomination/ emission or a complete adaptation using the **Switches** tab. The switch option is available only if it is configured via BPS Eco-Configurator

- MAG
- IR
- UV
- Composed
- Composed SNR
- OCR Ignore Failure
- OCR Fail to Unfit
- Security Feature

By enabling a switch, you are disabling that particular authenticity/ security feature. During banknote processing operations, banknotes will not be rejected for this particular feature.

This procedure shows how to switch on/off the authenticity features.

Requirements

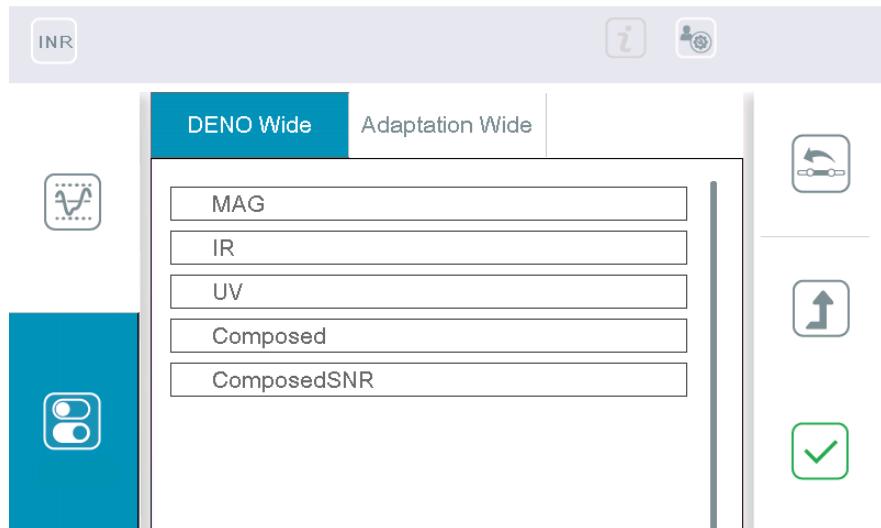
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

- [1] Select 
- [2] Select 

[3] Select the desired currency.

Switching On/Off Authenticity/Security Features for Denomination/Emission



[4a] In the **Denom** tab, select the authenticity/security feature you want to enable/disable.

[4b] Select 



[4c] Select the desired denomination/emission.

The numeric value stands for denomination and the character stands for emission.

[4d] Select 

⇒ The authenticity/security feature for that particular denomination/emission is disabled.

Switching On/Off the Authenticity/Security Feature for an Adaptation

[5a] Select the **Adaptation** tab.



[5b] Check the desired authenticity/security feature.

[5c] Select 

⇒ The authenticity/security feature is disabled for the entire adaptation.

⇒ The authenticity/security feature is switched on/off.

To reset to default, select .

9

Result

9.12 Changing the Fitness Threshold

Sorting thresholds are limit values for the fitness sorting of banknotes.

The set values apply to all operating modes. Depending on the adaptation, you may change the sorting threshold for every denomination that is based on emission and every property/quality of the banknotes.

The following procedure shows how to change the fitness threshold setting.

Requirements

- Supervisor login
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*
- The desired currency is selected.

Procedure

[1]

 Select 

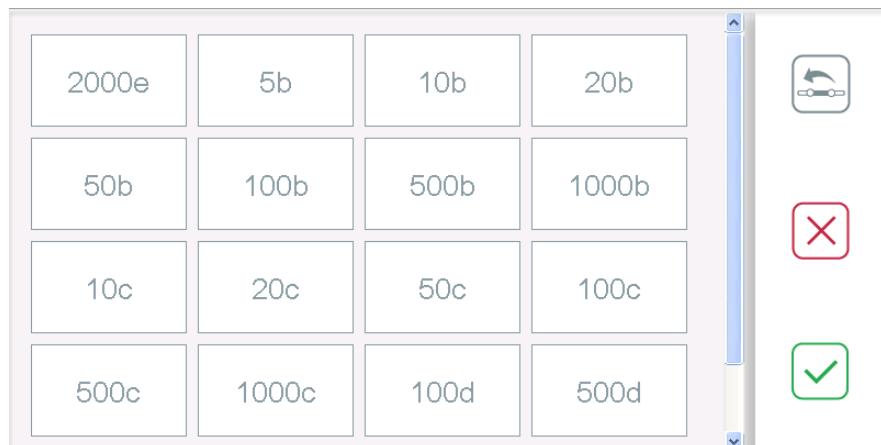
[2]

In the **Deno Wide** tab, select the mechanical sorting threshold that you wish to change.

To reset the threshold across all denomination/emission for all the mechanical threshold value, select .

9

[3]

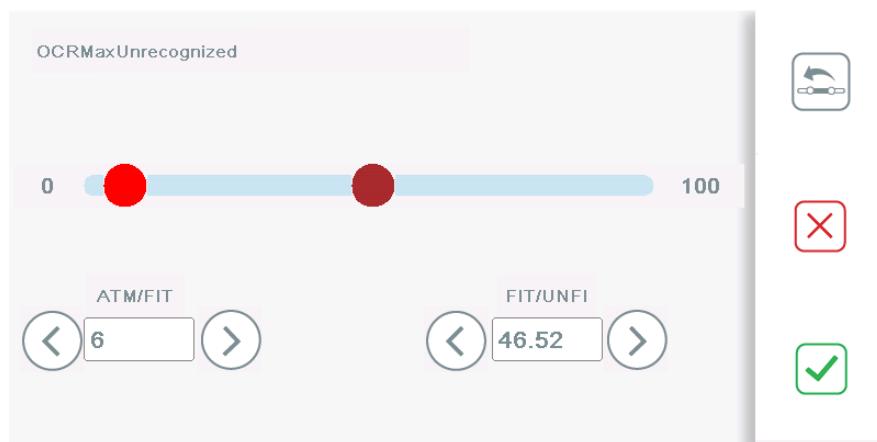
 Select 

[4]

Select the desired denomination/emission.

The numeric value stands for the denomination and the character stands for emission.

To reset the selected mechanical threshold value for all denomination/emission, select .

- [5] Select .



- [6] Change the threshold value using  / .

You can also move the  button to the desired value.

To reset the selected threshold value for the selected denomination/emission, select .

- [7] Select .

- [8] Select .

Result

⇒ The fitness threshold is set.

9.13 Improved Recording Tool (IRT)

You can record the raw data of the banknotes by connecting the BPS C2 with the IRT (Improved Recording Tool) and the together.

Raw data are recorded to:

- Create new adaptation
- Stabilize an adaptation

Following data can be recorded by the IRT to create and stabilize the adaptation:

- New currencies
- Suspicious and counterfeit banknotes
- New emission
- Fitness test decks like tapped, hole, tear , and so on

Process Overview

Record the raw data of the banknotes by following the steps:

1. Establish the connection between the BPS C2 system and a PC
2. Establish the connection between BPS C2 system and the IRT
3. Prepare the banknotes for recording the raw data
4. Capture Raw Data:
 - For new adaptation
 - For stabilizing adaptation

Connection Overview

To establish the connection, you must follow these steps:

1. Connect the BPS C2 and the PC using a LAN cable.
2. Set the IP address of BPS C2 and the PC in the same range.
This means that if you have set the IP address of the BPS C2 to 192.168. 2.2, the you must set the IP address of your PC to 192.168.2.x.
3. Enter the IP address of the PC in the **IRT** field in the BPS C2.
4. Enter the IP address of the BPS C2 in the IP Address field of the IRT and connect.

The following figure illustrates how to establish the connection between the BPS C2 and the PC.

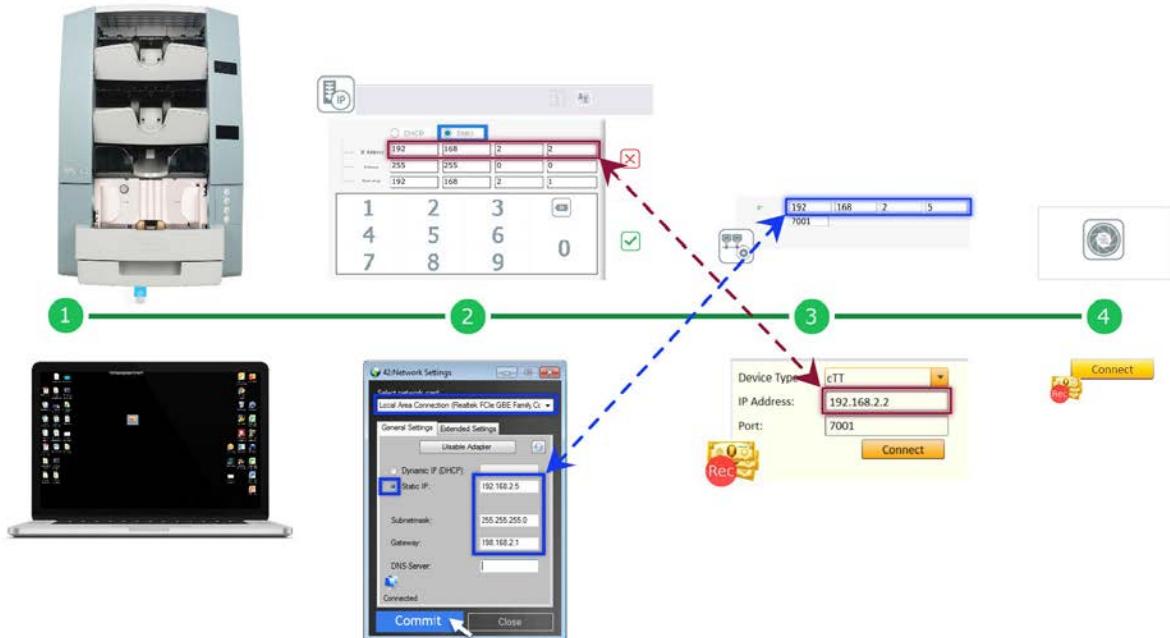


Figure 83: Connecting the BPS C2 to the PC

The following procedure shows how to record the raw data using IRT.

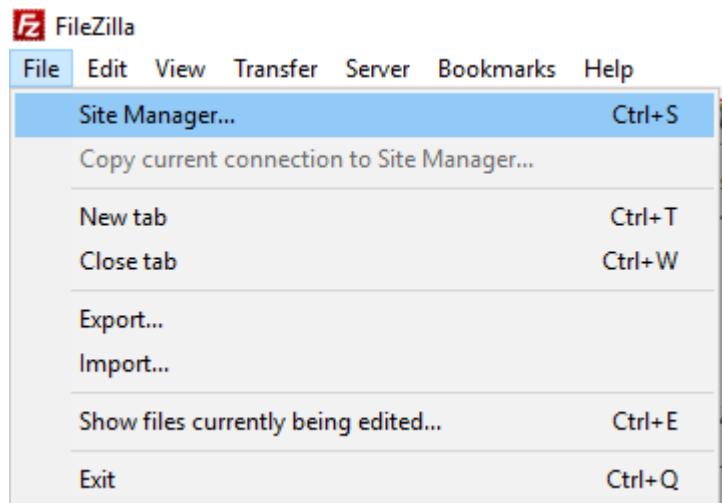
9

9.14 Uploading the .nif File in the CAPAAS Cloud

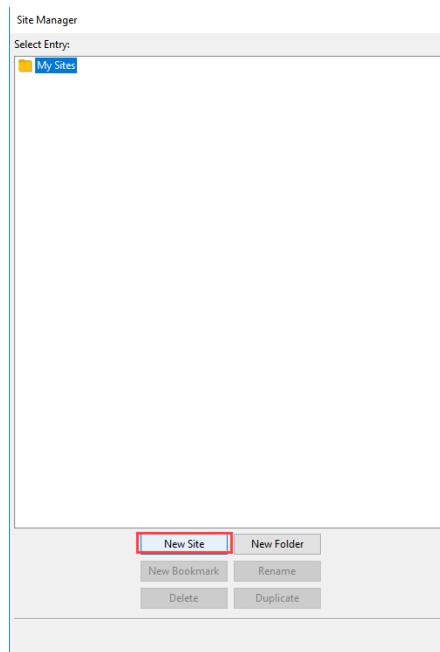
Requirements

- PC with open/ G+D office network Internet connection
- File transfer software installed in the PC, for example, FileZilla Client

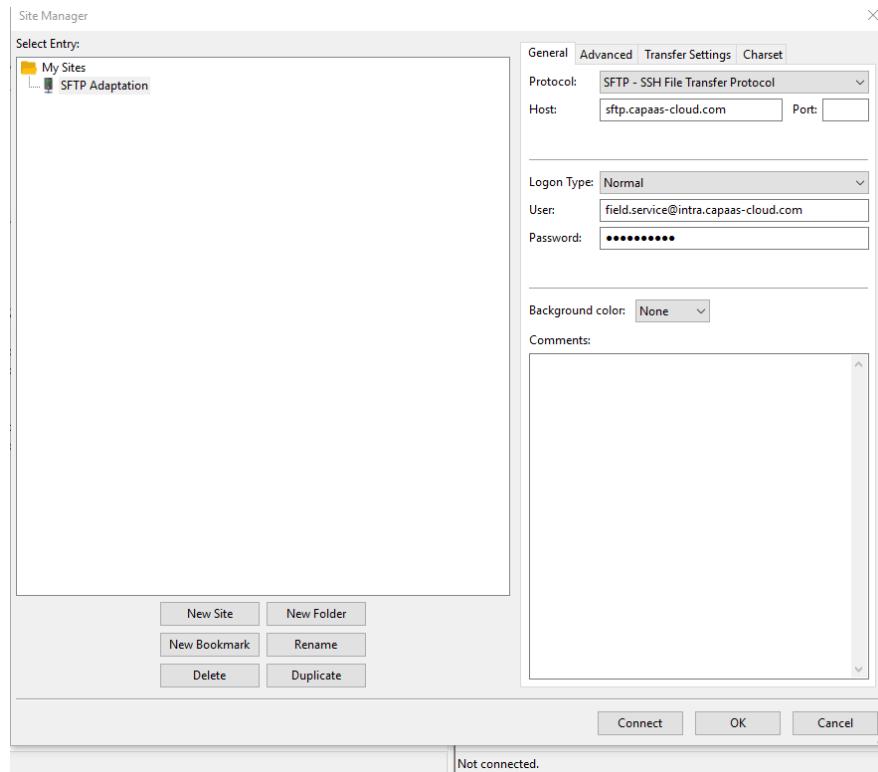
[1] Open the FileZilla Client.



[2] Select **File > Site Manager**.



[3] Create a new site.



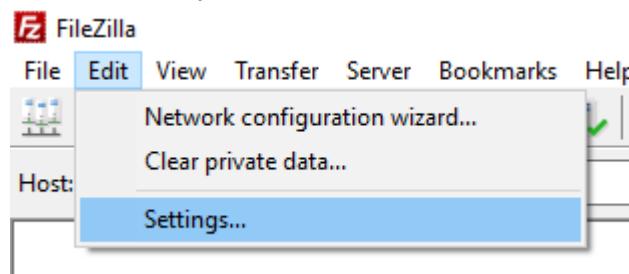
[4] Set the new site parameters.

Enter the following values:

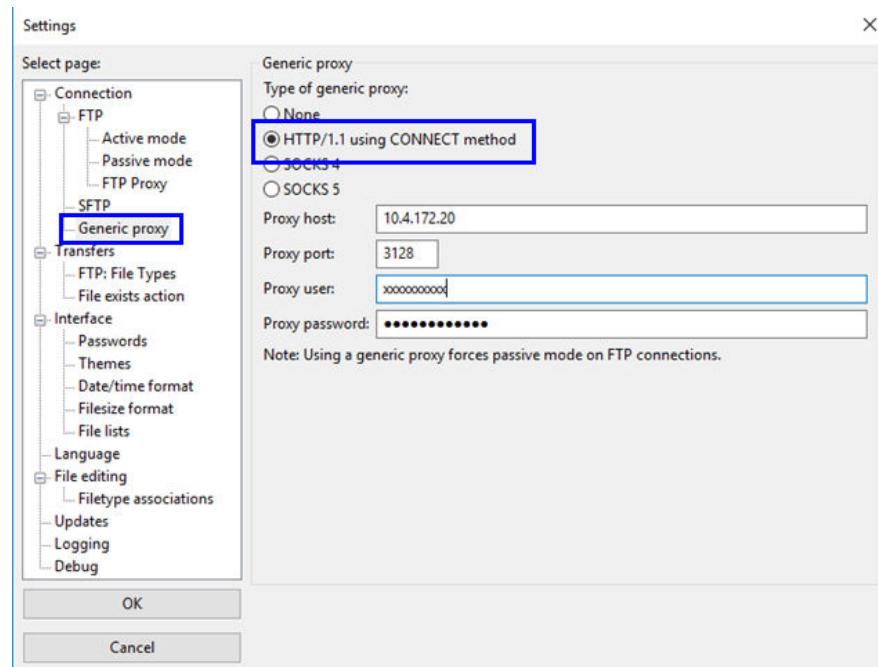
- **Host** : sftp://sftp.capaas-cloud.com
- **Protocol** : SFTP – SSH file transfer Protocol
- **Location Type** : Ask for password
- **User** : field.service@intra.capaas-cloud.com
- **Password** : Cloud.2019

[5] Select Connect.

Step 5-9: For G+D Office Network Users Only



[6] Select **Edit > Settings**.



[7] Set the **Generic proxy** parameters:

Enter the following values:

- **Proxy host:** 10.4.172.20
- **Proxy port:** 3128
- **Proxy user:** Windows User ID
- **Proxy password:** Windows Password

[8] Select **OK**.

[9] Select .

⇒ The SFTP is connected successfully. The **INCOMING/OUTGOING** directories appear on the **Remote site**.

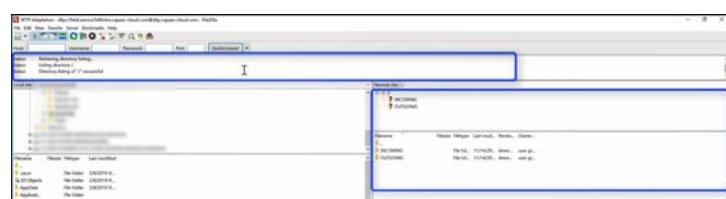
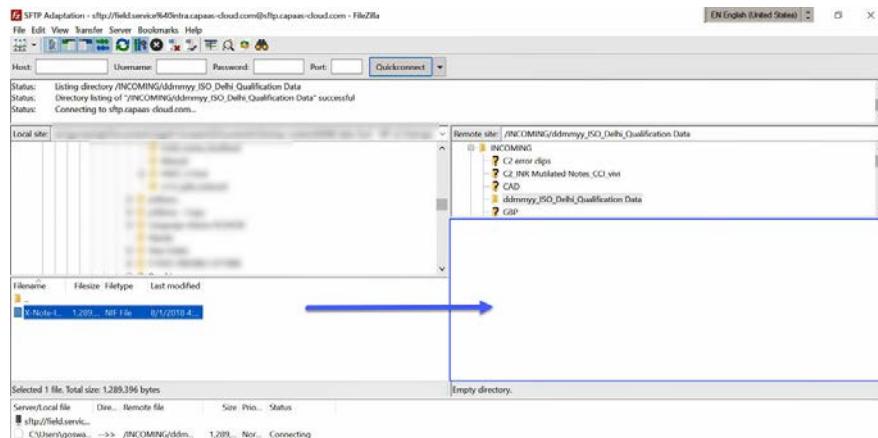


Figure 84: SFTP Connected

[10] Create a folder under the **INCOMING** directory.



[11] Drag and drop the .nif files in the folder.

Result

⇒ The .nif files are transferred successfully to the CAPAAS Cloud.

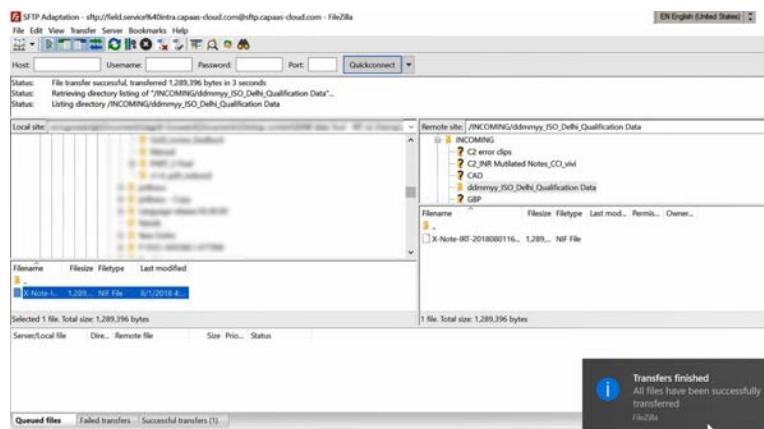


Figure 85: Files Transferred

9.15 Updating the Software Manually

The **Software** menu is available in the screen 2 of the service menu.



Figure 86: Software Update Menu

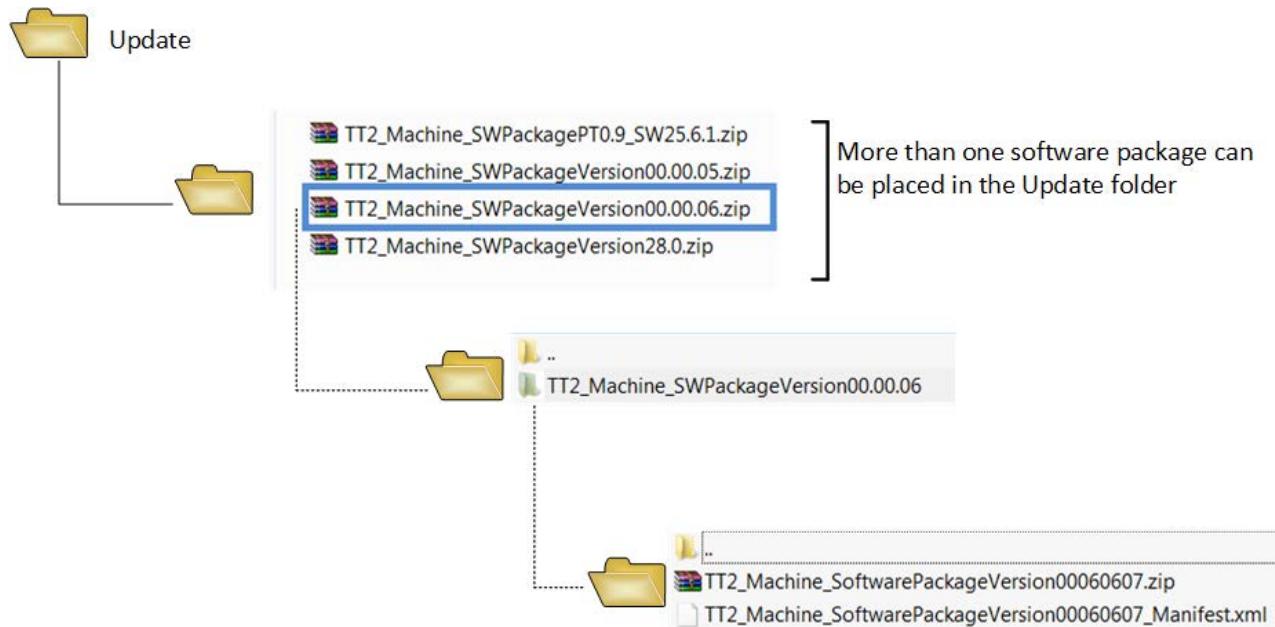
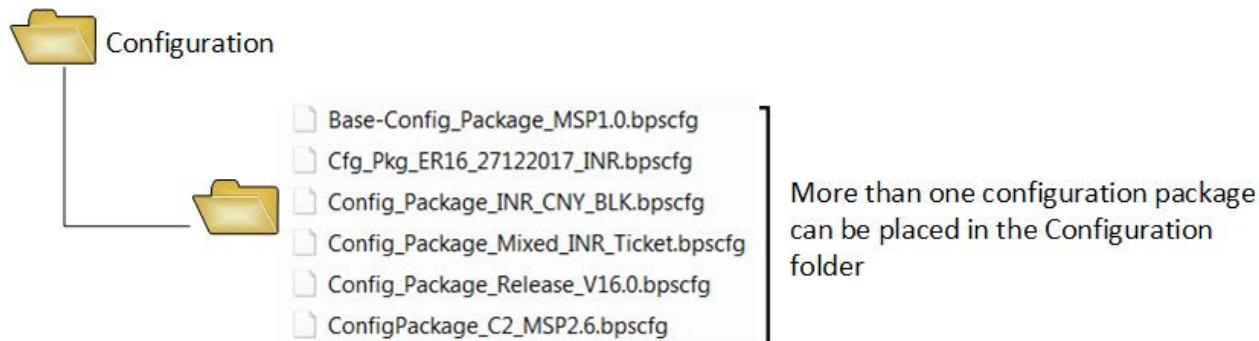
The **Software** menu provides the following options:

- Software Installation (- Configuration package (- Languages package (

9.15.1 Directory Structure for Software Update

A software update consists of the following directories and files.

Software Installation

**Figure 87: Software Installation Folder Structure****Configuration Package****Figure 88: Configuration Package Folder Structure****Language Package**

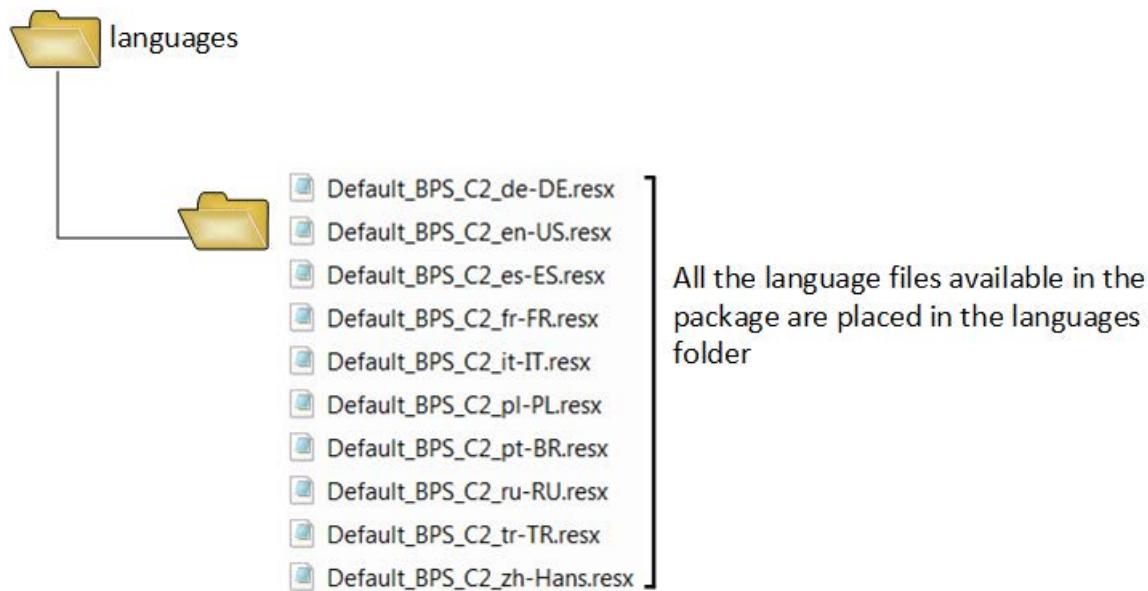


Figure 89: Language Package Folder Structure

9.15.2 Updating the Software Package

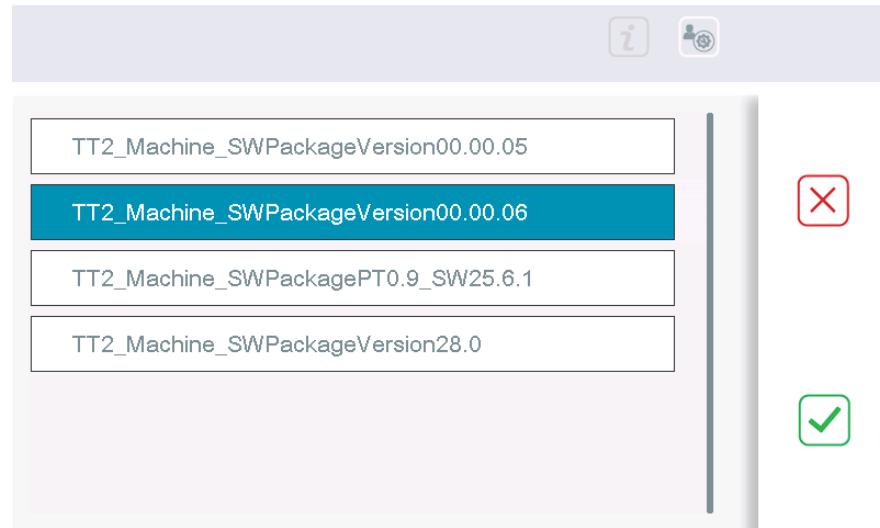
This procedure shows how to update the software package.

Requirements

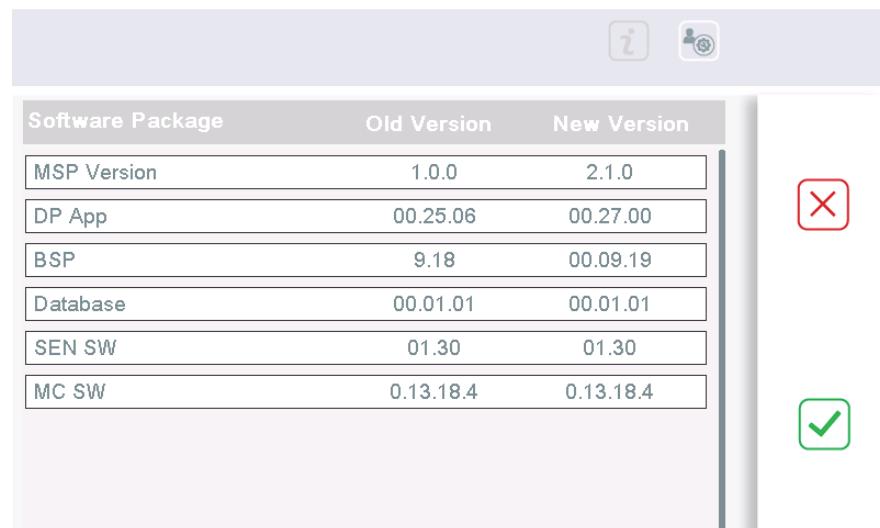
- USB stick plugged to the BPS C2
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

- [1] Select 
- [2] Select 



- [3]** Select the desired software package.
- ⇒ The software comparison screen appears to display the comparison between the existing software and the selected software.



Software Package	Old Version	New Version
MSP Version	1.0.0	2.1.0
DP App	00.25.06	00.27.00
BSP	9.18	00.09.19
Database	00.01.01	00.01.01
SEN SW	01.30	01.30
MC SW	0.13.18.4	0.13.18.4

- [4]** Check for the correctness of the software components and select .
- ⇒ The software installation status is displayed.

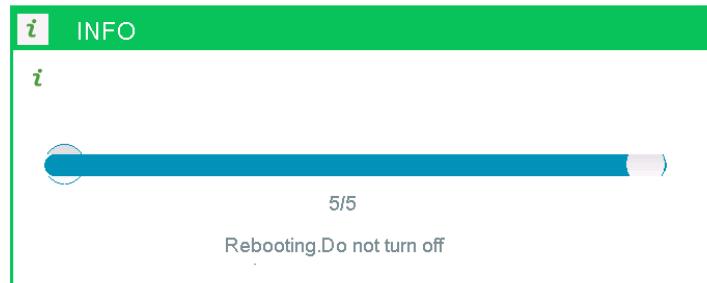


Figure 90: Software Installation Status

The BPS C2 will automatically reboot after the installation is complete.

The following message is displayed:

Software update successful

[5] Select .

Result

- ⇒ The software is updated.
You must adjust the fitness threshold after software installation/update.
→ *Section 9.12 “Changing the Fitness Threshold”, p. 148*

9.15.3 Updating Configuration Package

You can configure the BPS C2 in different ways as per requirement by installing/updating configuration package. The standard configuration package contains several default configurations.

You can create/customize the configuration package using the BPS Eco Configurator tool. You can customize the following features:

- Adding currency
- Grouping\customizing reject reasons
- Creating OP modes
- Customize/set reports targets/triggers

This procedure shows how to update the configuration package.

Requirements

- Supervisor login
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*
- The USB stick with the configuration package, placed in the *Configuration* folder, is plugged to the BPS C2/ Configuration package downloaded remotely.

**Important!**

When you update the configuration package, the existing data, OP modes, and reports are deleted.

Procedure

- [1] Select 
 - [2] Select 
 - [3] Select the desired installation file and version.
 - [4] Select 
- ⇒ You will receive a warning.
Warning Statistical data, OPmodes and reports will be deleted for the deleted adaptation. 1. Press Ok to continue. 2. Press Cancel to stop installation.

- [5] Select 

Result

- ⇒ The installation is complete. The BPS C2 saves a copy of the configuration package, which can be exported to a USB stick.

The  screen appears.

9

9.15.4 Updating Language Package

You can update the language package to install new languages or an updated version of the language package software.

The new version of the language package replaces the existing version.

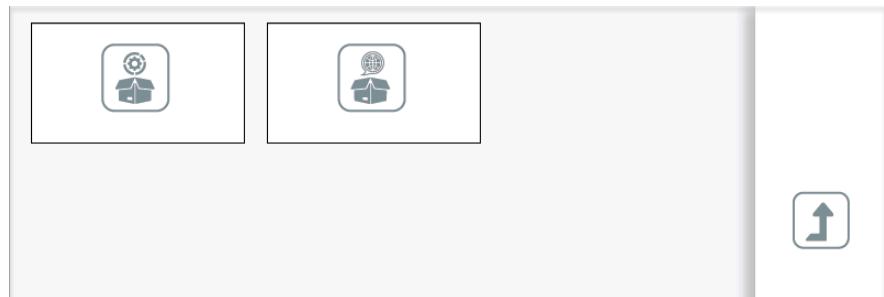
This procedure shows how to update the language package.

Requirements

- Supervisor login
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*
- The USB stick with the language package, placed in the *languages* folder, is plugged to the BPS C2 or Language package downloaded remotely.

Procedure

[1] Select 



[2] Select 

[3] Select the desired language package.

[4] Select 

Result

⇒ After installation, you will receive the following message:
Installation Status: Successful

9.16 System Testing

9

In the **System Test** menu, you can test the electrical and electronic component:

- PD Calibration value
- Map test
- Transport speed
- Singler speed
- Gate switching time
- Singler home position

System testing is performed during maintenance.

Test Result	Symbol
Success	

Test Result	Symbol
Failure	
Warning	

This procedure shows how to perform system test.

Requirements

- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

- [1] Select
- [2] Check the **Status** tab.
- [3a] If the test result is success, select to go back to the service menu.
- [3b] If the test status is red/yellow, select to check the details.

Result

- ⇒ The test status of the individual component is displayed.
Take a service action accordingly.

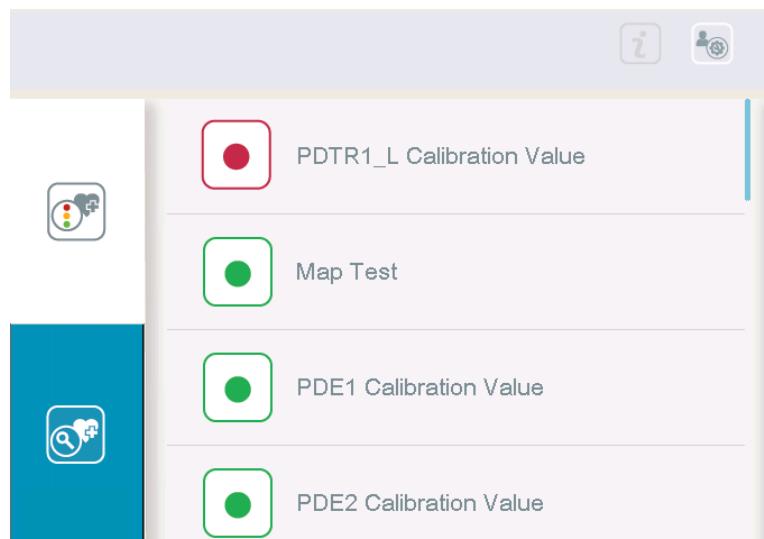


Figure 91: System Test Details

9.17 Exporting Raw Data

The **Export Raw data** menu is used to capture banknote raw data (*.nif*) file for:

- MTS Calibration Media
- Sensor Function Test Media

You can capture raw data for maximum 100 processed banknotes in one singling cycle from start to end.

This procedure shows how to export raw data to a USB stick.

Requirements

- USB stick plugged into the BPS C2
- Process banknotes as desired

Procedure

- [1] Log in.
→ *Section 9.2 “Logging in as Service”, p. 130*
- [2] Select .
⇒ You will receive the success message.
- [3] Select .

Result

- ⇒ Raw data is exported to the USB stick.

9

9.18 Copying Log Files to USB Stick

You can create troubleshooting traces and logs, and transfer the logs to a USB stick plugged. The log contains the data of the current software status.

This procedure shows how to copy dump logs to a USB stick.

Requirements

- USB stick plugged to the BPS C2

Procedure

- [1] Log in.
→ *Section 9.2 “Logging in as Service”, p. 130*
- [2] Select .
⇒ Following message is displayed:
Logs extraction successful

	[3] Select 
Result	⇒ The troubleshooting traces and logs are created, and transferred to a USB stick

9.19 Setting the Trace Level

The **Trace Level** menu option is used to set the level of details to be included in the dump logs for the DP (data processing) software.

The default trace level setting is **ERROR**. The trace level can be changed as required depending upon the issue that will be analyzed. However, the changes will be valid only till the BPS C2 is shutdown. The trace level changes to the default value on restart.

There are three levels:

- **ERROR**
- **INFO**
- **DEBUG**

The trace logs are used for debugging the DP software.

This procedure shows how to set the trace level.

Requirements

- Supervisor login
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

[1]	Select  .
-----	--



[2] Select the level as desired.

[3] Select .

Result

⇒ The trace level setting is updated.

9.20 Setting the Self Test Level

The **Self Test** menu option is used to set the severity level of the dump logs for the sensor software. These logs are used to debug any sensor software-related errors.

The default self-test level is **Default**. The self-test level can be changed as required depending upon the severity of the issue that is being analyzed.

This procedure shows how to set the self-test level.

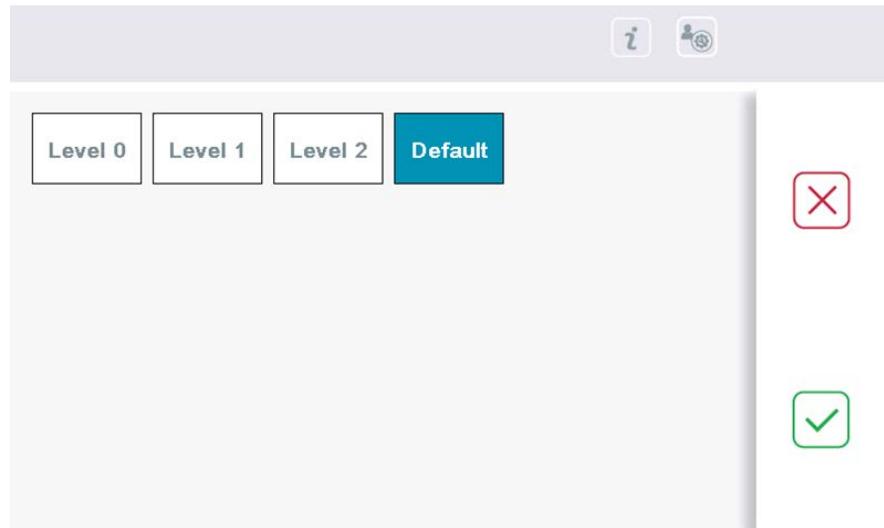
Requirements

- Supervisor login
- Service login

→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

[1] Select .



[2] Select the desired test level as desired.

[3] Select .

Result  The self-test level has been set.

9.21 Backup and Restore Using SD Card

You can take the backup of BPS C2 data on SD card and restore it in case there is a failure in the data processing software.

In case of software failure, you can restore the BPS C2 with the version of the data processing software installed previously and then restore the data backup from the SD card.

You can retain the following data on the SD Card:

- Global Banknote counter
- Transport on time
- Singler on time
- Power on time
- Machine serial number
- Reports data
- All system settings
- Threshold and switch settings

9.21.1 Generating a Backup on the SD Card

Requirements

- SD card installed in the BPS C2
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*

Procedure

[1] Select .

⇒ The BPS C2 data will be transferred to the SD card.

[2] Select .

Result

⇒ You have successfully generated the data backup on the SD card.

9.21.2 Restoring Backup from the SD Card

Requirements

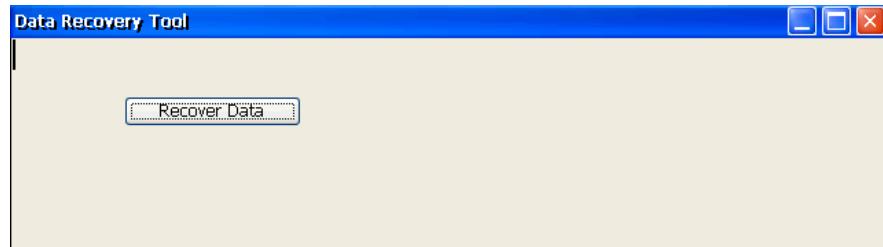
- SD card installed in the BPS C2
- Service login
→ *Section 9.2 “Logging in as Service”, p. 130*
- External USB keyboard connected to the BPS C2

Procedure

[1] Interrupt the boot-up procedure by pressing the **Enter** key after the start.

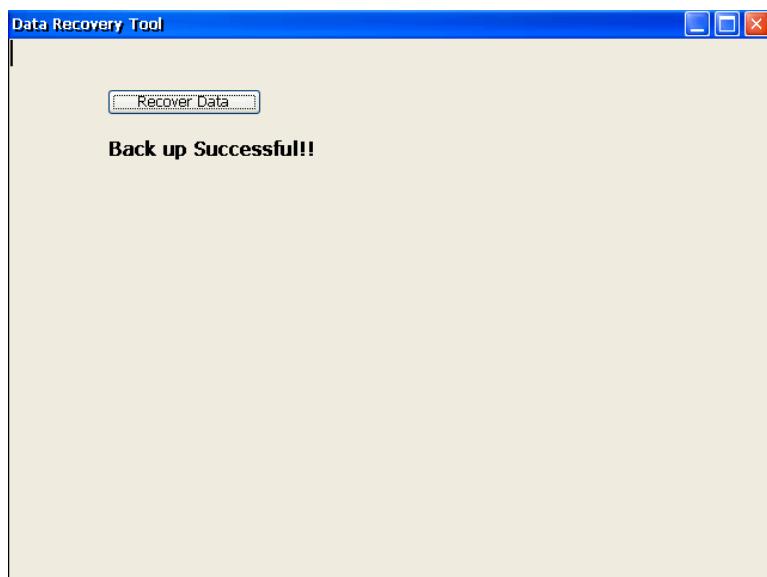


[2] Select **Data Recovery Tool** menu option.

**[3] Select Recover Data.**

Result

- ⇒ You have successfully restored the backup data from the SD card.

**Figure 92: Backup Data Restore Successful**

10 Cleaning

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 when looking soiled

Always switch off the machine before cleaning it.

The dust tray is at the bottom of the machine.



Important!

Do not remove the dust tray when the banknote processing is in progress



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.

10

**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)
- Cleaning set MTS (Art.-No. 518493001) 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 cleaning set MTS to remove heavy soiling.

Cleaning the Sensor Area

- [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.

- [18] 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.

10.1 Cleaning the Dust Tray

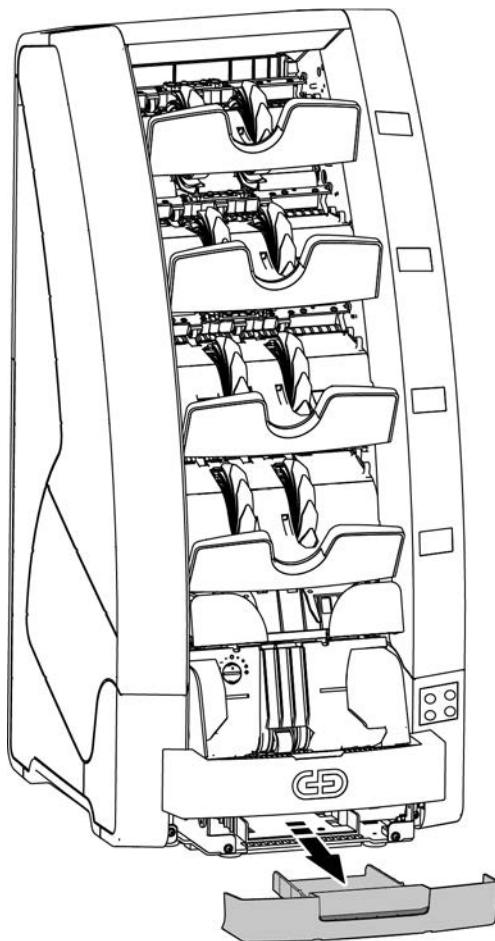
The dust tray, located at the bottom of the BPS C2, is a receptacle that collects all the dust from the machine.

You must clean the dust tray at regular intervals.

Requirements

- The BPS C2 is switched off.

Procedure



- [1] Remove the dust tray.
- [2] Empty the tray if it is full of dust.
- [3] Remove the dust using a clean cloth.

Result ⇒ [4] Reattach the dust tray.

Result ⇒ The dust tray is cleaned.

10.2 Cleaning the Display Module

This procedure shows how to clean the touchscreen display module.

Requirements

- Commercially available mild cleaning solutions
- Clean, lint-free clothes (for cleaning)



NOTICE

Incorrect cleaning materials
can damage the machine/device.

Do not use cleaning material with a corrosive or scouring effect.

Procedure

- [1] Switch off the BPS C2.
- [2] If the touchscreen is soiled, first clean it with a clean, lint-free cloth.
- [3] Apply a mild cleaning solution to a clean, lint-free cloth and carefully remove fingerprints and other residue.



Important!

Never apply sprays or cleaning fluids directly to the touchscreen.

Result

⇒ The display module is cleaned.

10

10.3 General Maintenance Tasks

In addition to cleaning, you are required to check the BPS C2 and replace the worn-out parts.

Requirements

- The BPS C2 is switched off and unplugged.

- [1] Check the BPS C2 for damage.

Note if there is any damage that may have an adverse effect on safety, such as:

- Damaged main cable or damaged power plug
- Broken parts with sharp edges

- [2] Check the photo detectors and prisms for damage.
- [3] Check all the friction elements in the singler compartment for damage and wear.
- [4] Check the hopper and feeder elements on the banknote collecting plate for soiling, damage and wear.
- [5] Replace any worn or damaged parts.

Result

⇒ You have completed the general maintenance tasks.

11 Preventive Maintenance

Maintenance includes cleaning and checking the BPS C2, 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"*.

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

11.1 Preventive Maintenance Workflow

Maintenance Workflow		
Software Version:		
OS Version:		
Database Version:		
Machine Control Software Version:		
Sensor Software Version:		
FPGA:		
Currency (ISO-Code) and Version		
1	4	7
2	5	8
3	6	9
General Overview		
Problems	Ask customer if there are currently any problems with the BPS C2.	
Optical test	Check general status of the BPS C2.	

General Overview		
Initial test	Test the BPS C2 with blanks\banknotes for correct operation before carrying out the strip down and service.	
System test	Run System Test and check the result in dump log to analyse the machine status. → <i>Section 9.16 "System Testing", p. 163</i>	
Transport/Singler Health Test	Test the transport and singler health by running some banknotes in the Service Mode . → <i>Section 9.8 "Testing the BPS C2 Transport and Singler Health", p. 139</i>	
Test Sensor Functions	Run some test documents to check the sensor health status. → <i>Section 9.10 "Testing the Sensor (Functional Test)", p. 144</i>	
Last preventive maintenance start date/banknotes processed:		
Current preventive maintenance start date/banknotes processed:		
Next planned preventive maintenance start date/banknotes processed:		
General Service		
1	Remove all covers.	
2	Perform the cleaning and general maintenance task. → <i>Chapter 10 "Cleaning", p. 171</i>	
3	Vacuum the BPS C2 and inspect as per service details. → <i>Chapter 10 "Cleaning", p. 171</i>	
4	Install any software\adaptation updates as required. → <i>Section 9.15 "Updating the Software Manually", p. 156</i>	
5	Carry out the MTS calibration procedure. → <i>Section 9.9 "Calibrating the Sensor - MTS (Mechanical Thickness Sensor)", p. 142</i>	
Singler Inspection		
1	Check friction roller of hopper assembly for wear and damage.	
2	Check the singler drum and hopper assembly for wear and damage.	
3	Replace any worn or damaged parts.	

Singler Inspection

	→ <i>Section 8.4 "Replacing Parts in the Singler Module", p. 50</i>
4	Perform the singler adjustment. → <i>Section 8.16 "System Adjustment", p. 112</i>

Transport Area Inspection

1	Check the transport rollers for wear and damage.
2	Check the shafts of all rollers for firm seating.
3	Clean all the PDs.
4	Replace any worn or damaged parts.

Bearing and Bearing Housing Inspection

1	Check all bearings and bearing housings for wear and damage.
2	Make sure that the bearing housings are not damaged or cracked.
3	Check that the bearings are firmly seated and not worn.
4	Replace the roller unit if a bearing is exhibiting too much play.

Banknote Gates Inspection

1	Open and close the banknote gates manually to check that the mechanical function is correct.
2	Check that the banknote gates can move freely without hindrance.
3	Check and perform gate gap adjustment if required. → <i>Section 8.16.1 "Adjusting the Diverter Gate Gap", p. 112</i>

Toothed Belts Inspection

1	Check all the toothed belts for wear and tear.
2	Replace the worn out toothed belts.

Timing Belt Pulleys Inspection

1	Check all the timing belt pulleys for wear and tear.
2	Replace the worn out timing belt pulleys.

Sensors Inspection

1	Check the sensors for damage.
2	Check the measurement windows (glass plates) of the PIS and UV sensor for cracks and scratches.
3	Check the sensor for soiling behind the measurement windows.

Sensors Inspection	
4	Check all the electrical/sensor connectors.
Cable Connections Inspection	
1	Check all the cables on the machine for damage.
2	Replace any chafed or kinked cables.
Software Diagnostics	
1	Fit in all the cover elements.
2	Close the BPS C2.
3	Plug the power plug into the socket.
4	Switch on the BPS C2.
5	Use the Service OpMode menu to test the following: <ul style="list-style-type: none"> ● Singler transport and health ● Sensor functions
6	Run System Test and compare the value with the test performed in the beginning of the maintenance workflow.

A Belts Overview

A

There are 16 toothed belts on the RHS and eight toothed belts on the LHS.

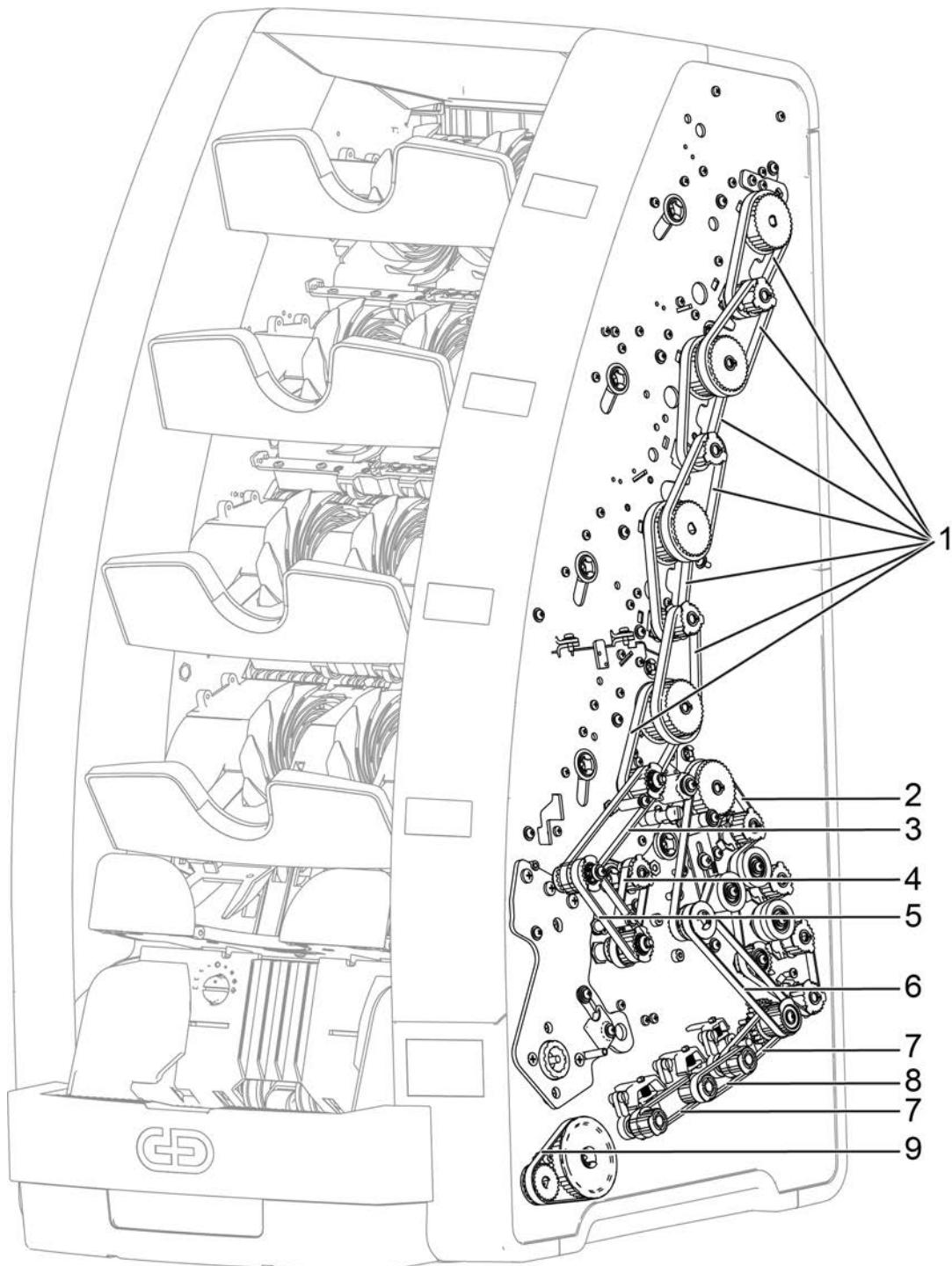


Figure 93: Belts Overview (RHS)

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A

Item No	Article Number	Lenth (mm)	Width (mm)
1	509894000	192	6
2	517501000	597	6
3	517499000	246	6
4	509923000	153	6
5	517498000	171	6
6	517558000	232	6
7	509692001	150	6
8	509691001	130	6
9	509893000	195	6

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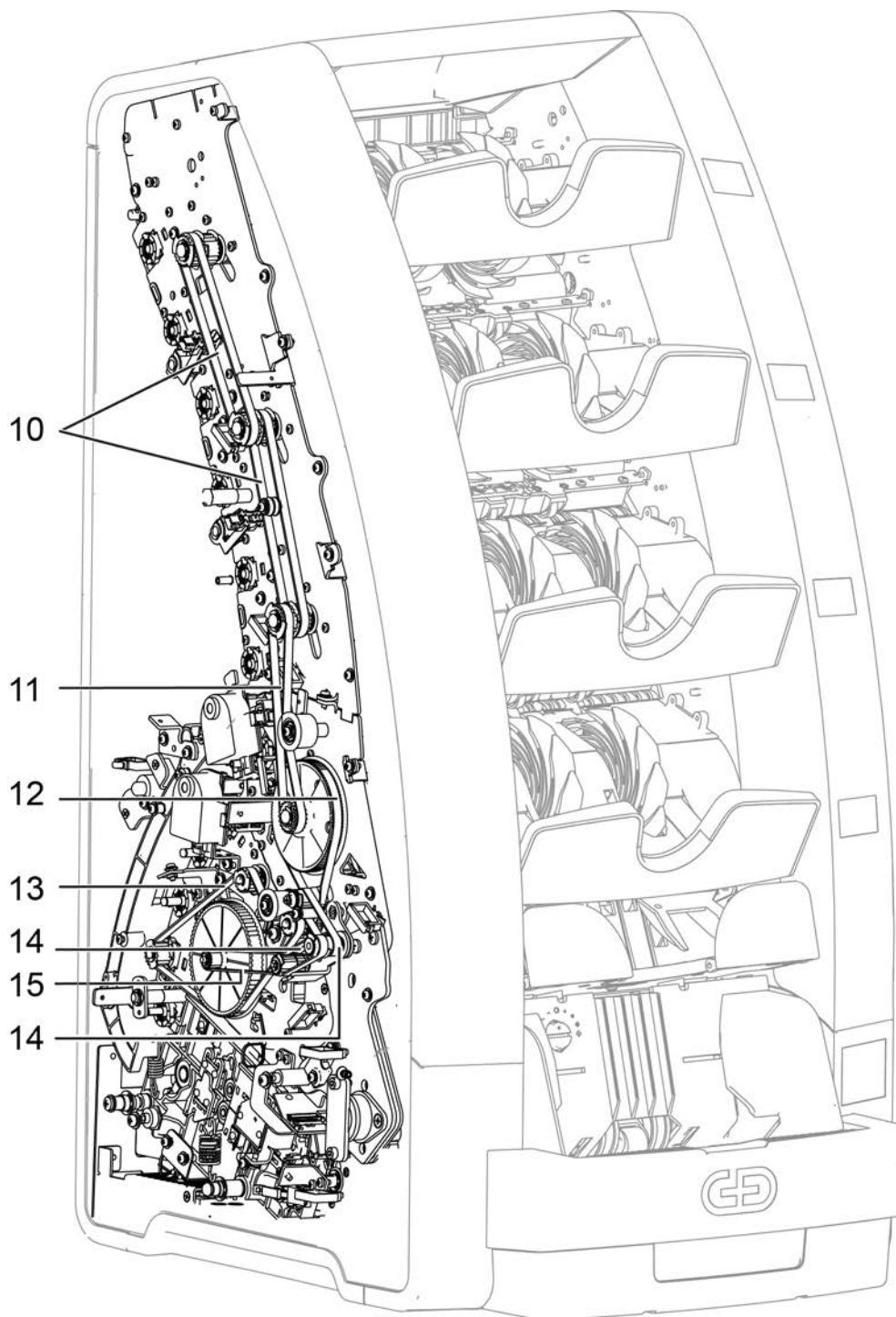


Figure 94: Belts Overview (LHS)

Item No	Article Number	Length (mm)	Width (mm)
10	509894000	303	6

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A

Item No	Article Number	Length (mm)	Width (mm)
11	513172000	300	6
12	518052000	242	6
13	517495000	120	6
14	517496000	224	6
15	517500000	393	6

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B Technical Data

The following table lists the technical data:

	Values
Maximum transport speed	1,050 BNs/min for counting, authenticity detection, fitness sorting, serial number reading You can also set two different speed levels: <ul style="list-style-type: none">• High (1050 BNs/min)• Low (720 BNs/min)
Deposit capacity (singler)	up to 500 BNs depending on the banknote quality
Stacker capacity	up to 250 BN
Banknote formats handled	Length: 100 - 181 mm Width: 60 - 85 mm Thickness: Approx 50 - 130 micro meter
Number of adaptations	Up to 10 adaptations
Display	7" LCD display for GUI 3-digit, 7-segment LED display for standard stacker
Power supply connection	Fully molded mains lead plug to IEC Socket C14 Rated: 100/240 V
Frequency	50/60 Hz
Electrical power consumption	125 W
Fuse protection	3.15 A
Dimensions	<ul style="list-style-type: none"> • BPS C2-2: 390 x 330 x 510 mm (depth x width x height) • BPS C2-3: 430 x 330 x 620 mm (depth x width x height) • BPS C2-4: 430 x 330 x 740 mm (depth x width x height)

B

	Values
Weight	<ul style="list-style-type: none"> ● BPS C2-2: 27 kg ● BPS C2-3: 32 kg ● BPS C2-4: 36 kg
Transport system	Friction roller
External devices (optional)	<ul style="list-style-type: none"> ● Printer ● Barcode reader ● Mouse ● Keyboard
Sensors	PIS sensor MTS sensor MAG sensor UV sensor

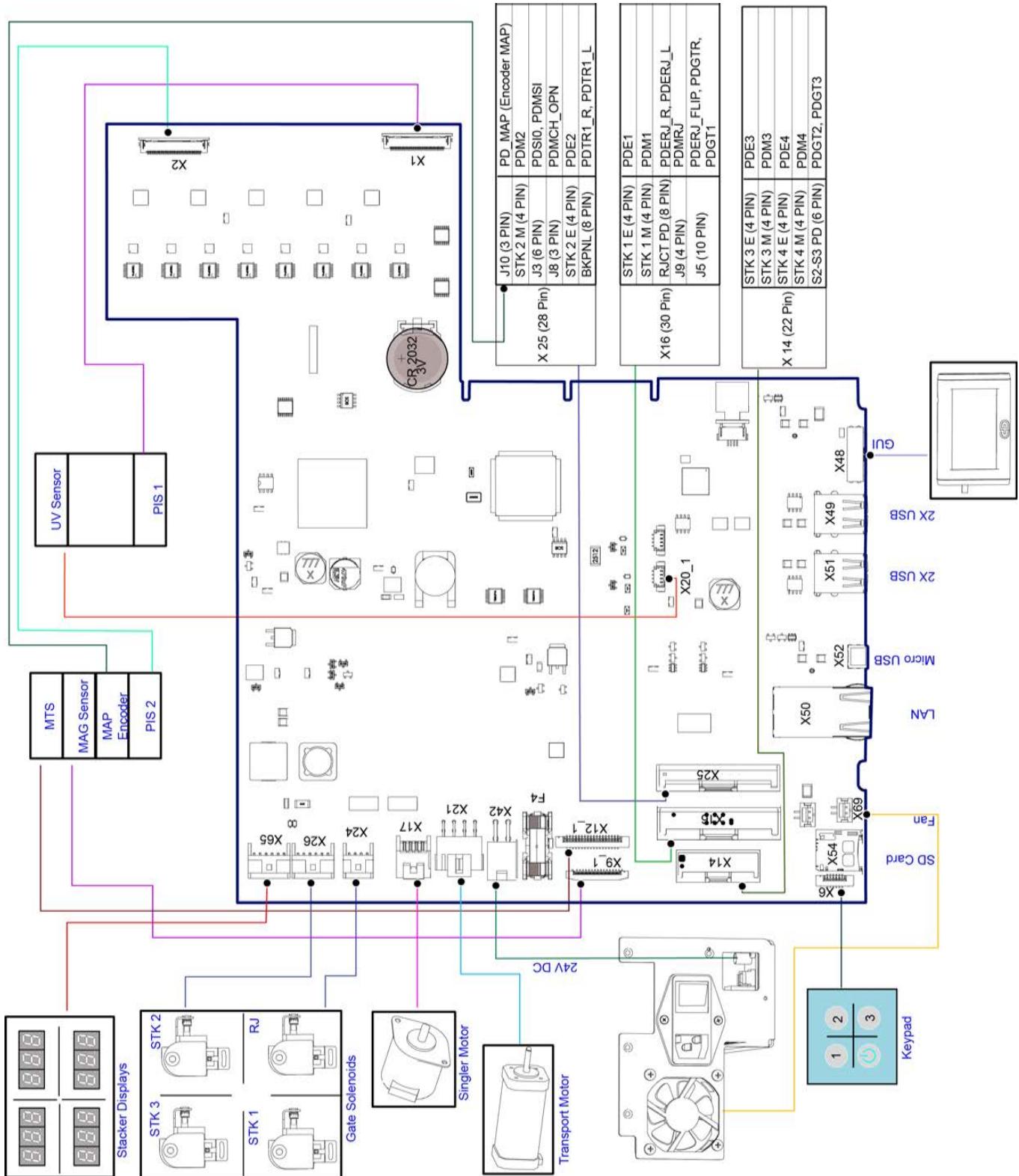
Table 1: Technical Data

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C PCB Main Connectors Diagram

C

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Description of Connectors

Connector	Description
X65	Stacker display
X24, X26	Gate solenoids
X17	Singler motor
X21	Transport motor
X42	Power supply
X9_1	Magnetic sensor
X12_1	MTS sensor
X20_1	UV pure sensor
X14	PD cables 22 pairs
X16	PD cables 30 pairs
X25	PD cables 28 pairs
X6	Key pad
X69	Fan
X50	LAN
X52	Micro USB
X51	USB slot1
X49	USB slot2
X48	GUI
X1	PIS1 bottom
X2	PIS2 top

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D Connectors Pin assignment Diagram

(X65) Stacker Display

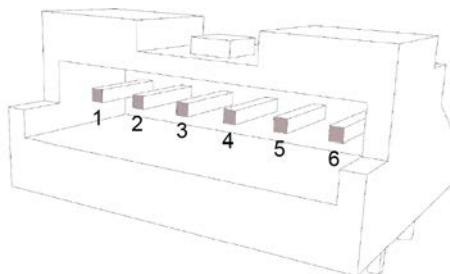


Figure 95: X65 Connector

PIN	
1	I2C_CLK
2	I2C_ADDR0
3	5V
4	DGND
5	I2C_ADDR1
6	I2C_DAT

(X24) Gate Solenoid 1
and Gate Solenoid 2

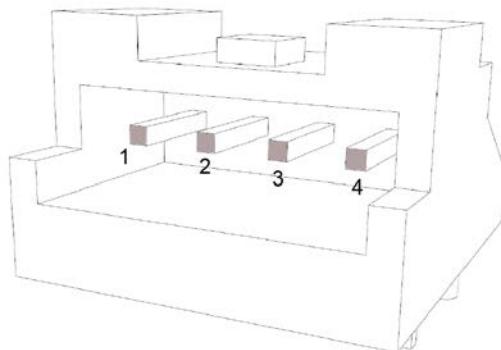


Figure 96: X24 Connector

PIN	
1	MCTRL GT1 A1
2	MCTRL GT1 A2
3	MCTRL GT1 B1

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(X26) Gate Solenoid 3
and Gate Solenoid 4

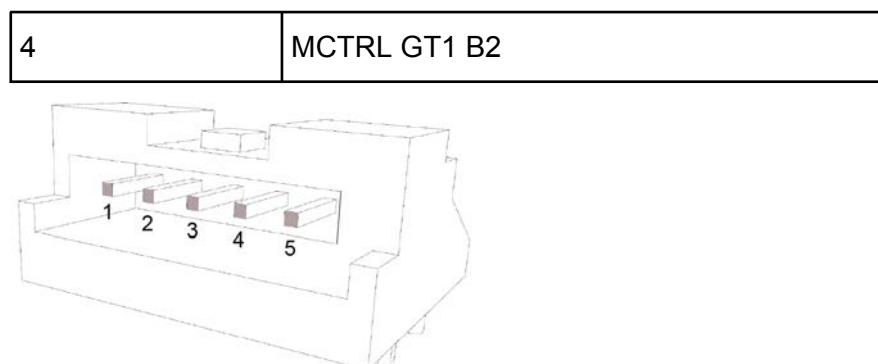


Figure 97: X26 Connector

PIN	
1	MCTRL GT1 A1
2	
3	MCTRL GT1 A2
4	MCTRL GT1 B1
5	MCTRL GT1 B2

(X17) Singler Motor

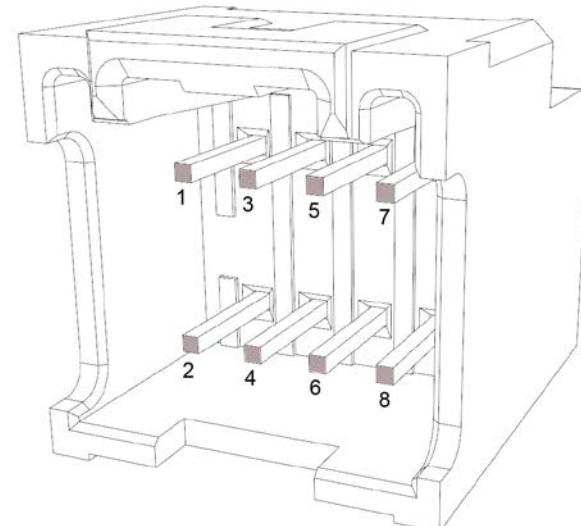


Figure 98: X17 Connector

PIN	
1	MCTRL_SM_SLEEP

2	5V
3	DGND
4	MCTRL_SM_DIR
5	MCTRL_SM_BRAKE
6	MCTRL_SM_PWM
7	DGND
8	24V

(X21) Transport Motor

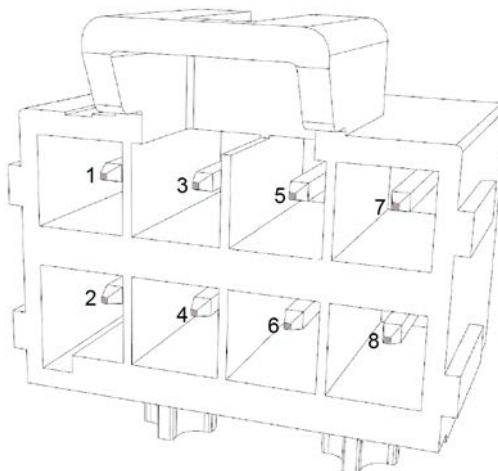


Figure 99: X21 Connector

PIN	
1	MCTRL_BLDC.MOT3
2	5V
3	MCTRL_BLDC.MOT2
4	MCTRL_BLDC_HA1
5	MCTRL_BLDC.MOT1
6	MCTRL_BLDC_HA2
7	DGND

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(X42) Power Supply

8	MCTRL_BLDC_HA3
---	----------------

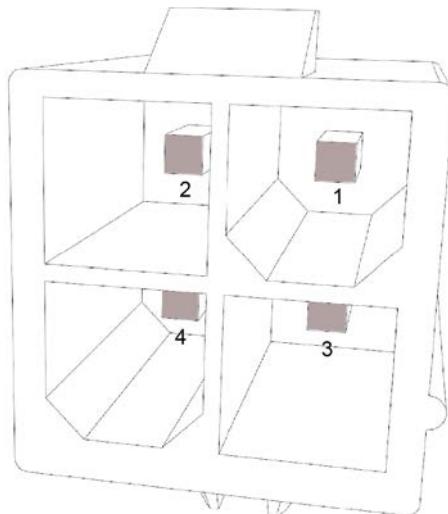


Figure 100: X42 Connector

PIN	
1	24V
2	DGND
3	24V
4	DGND

(X20_1) UV Pure Sensor

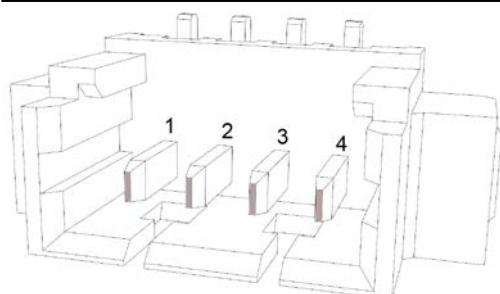


Figure 101: X20_1 Connector

PIN	
1	SENSOR.3.LED
2	SENSOR.3.SIG

(X16) PD Cables 30
Pairs

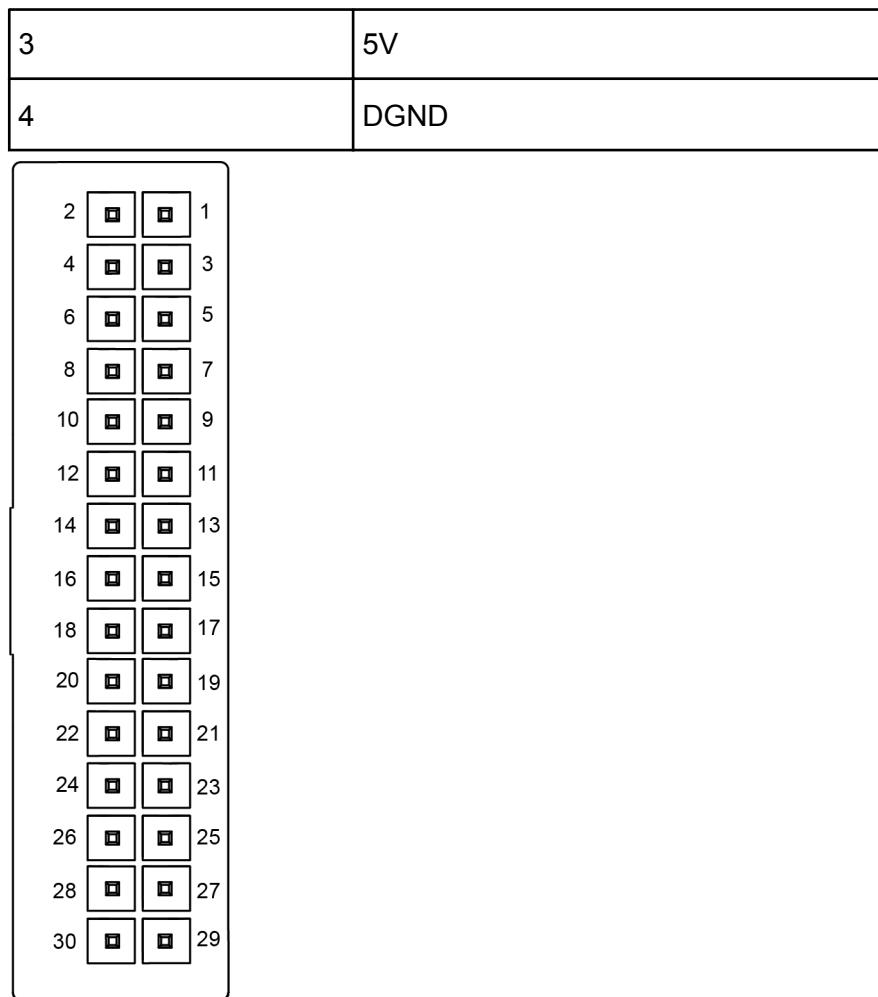


Figure 102: X16 Connector

PIN		
1	3V3	LED - Stk1 Exit
2	OCE1	
3	3V3	PD - PDE1 - Stk1 Exit
4	MCTRL_CON.PDE1	
5	3V3	LED - Stk1 Monitoring
6	OCM1	
7	3V3	PD - PDM1 - Stk1 Monitoring

D

8	MCTRL_CON.PDM1	
9	3V3	LED - OCERJ_L - Reject Path Left
10	OCERJ_L	
11	3V3	PD - PDERJ_L - Reject Path Left
12	MCTRL_CON.PDERJ_L	
13	3V3	LED - OCERJ_L - Reject Path Right
14	OCERJ_R	
15	3V3	PD - PDERJ_R - Reject Path Right
16	MCTRL_CON.PDERJ_R	
17	3V3	LED - OCMRJ - Reject Monitoring
18	OCMRJ	
19	3V3	PD - PDMRJ - Reject Monitoring
20	MCTRL_CON.PDMRJ	
21	5V	PD - PDGTR - Reject Solenoid
22	MCTRL_CON.PDGTR	
23	DGND	
24	5V	PD - PDGTI - Stk1 Solenoid
25	MCTRL_CON.PDGTI	
26	DGND	
27	5V	PD - PDERJ_FLIP - Reject Pressure Flap
28	MCTRL_CON.PDERJ_FLIP	
29	DGND	
30	DGND	

(X25) PD Cables 28
Pairs

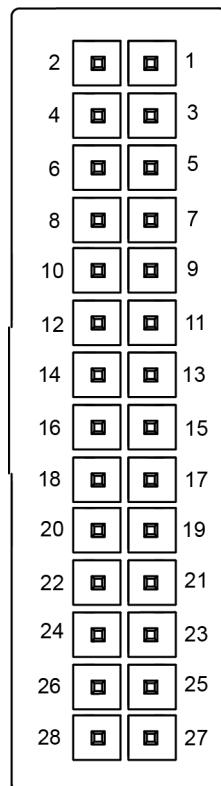


Figure 103: X25 Connector

PIN		
1	5V	PD - PDSI0 - Singler Home Position
2	MCTRL_CON.PDSI0	
3	DGND	
4	5V	PD - PDMS - Singler Bank-note Detection
5	MCTRL_CON.PDMS	
6	DGND	
7	3V3	LED - OCE2 - Stk2 Exit
8	OCE2	
9	3V3	PD - PDE2 - Stk2 Exit
10	MCTRL_CON.PDE2	

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D

11	3V3	LED - OCM2 - Stk2 Monitoring
12	OCM2	
13	3V3	PD - PDM2 - Stk2 Monitoring
14	MCTRL_CON.PDM2	
15	3V3	LED - Reject First Gate Left Before Reject Gate
16	OCE_FIRSTGATE_L	
17	3V3	PD - Reject Gate Left Before Reject Gate
18	MCTRL_CON.PDE_FIRST-GATE_L	
19	3V3	LED - Reject Gate Right Before Reject Gate
20	OCE_FIRSTGATE_R	
21	3V3	PD - Reject Gate Right Before Reject Gate
22	MCTRL_CON.PDE_FIRST-GATE_R	
23	5V	PD - MCH_OPN - Machine Opening
24	MCTRL_CON.PDMCH_OPN	
25	DGND	ENCODER/MAP at Sensor Housing
26	5V	
27	FPGA_GPIO.ENCODER_IN PUT	
28	DGND	

(X14) PD Cables 22
Pairs

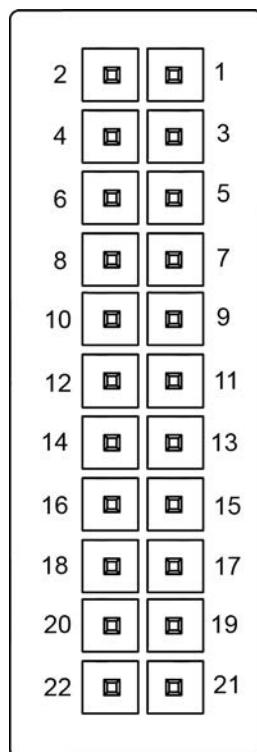


Figure 104: X14 Connector

D

PIN		
1	3V3	LED - Stk3 Exit
2	OCE3	
3	3V3	PD - PDE3 - Stk3 Exit
4	MCTRL_CON.PDE3	
5	3V3	LED - Stk4 Exit
6	OCE4	
7	3V3	PD - PDE4 - Stk4 Exit
8	MCTRL_CON.PDE4	
9	3V3	LED - Stk3 Monitor- ing
10	OCM3	

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D

PIN		
11	3V3	PD - PDM3 - Stk3 Monitoring
12	MCTRL_CON.PDM3	
13	3V3	LED - Stk4 Monitor- ing
14	OCM4	
15	3V3	PD - PDM4 - Stk4 Monitoring
16	MCTRL_CON.PDM4	
17	MCTRL_CON.PDGT2	PD - PDGT2 - Stk2 - Solenoid
18	DGND	
19	5V	PD - PDGT3 - Stk3 - Solenoid
20	MCTRL_CON.PDGT3	
21	DGND	
22	5V	

E Reports

The following table lists all available reports.

Type of Report	Accessibility	Report Content
Deposit report	Operator	Accounting of the deposit with date, accounting period, sorting criteria (if set), expected value, information on non-recognized banknote, for each issue.
Customer report	Operator	Account report with the accumulated processing data for the last customer's deposit: customer no., number and value of the processed banknote (total and per denomination) information about sorting for each issue.
Operator report	Operator, Supervisor	Statistics of the accumulated processing data for the last registered user: operator ID, number and value of the banknote processed (total and per denomination) and information about sorting for every banknote series.
Machine report	Operator	Statistics about the accumulated processing data for the machine (since the counter was last reset): Time of the last reset of the machine's accounting data, machine no., number and value of the banknote processed (total and per denomination) and
*Not for USA/Canada		

Type of Report	Accessibility	Report Content
		information about sorting for each issue.
XML deposit report	Operator	Report with date and time, time of processing of a customer, header card numbers, deposit IDs, denomination (for multi entries of the largest denomination), time of the deposit processing, information about whether there were any rejects.
Daily result	Operator, Supervisor	Report for daily result: Machine ID, generation time, start time of first deposit, end time of last deposit, reject rate, reject reasons, coin value, value of cashless deposit, deposit data (sorting criteria of quality, currency, denomination, number, value, rejects, destroyed banknote*), total deposit and sum, name of currency The report contains the difference since the last time a report was automatically generated. If the report is manually requested, it is not reset.
Sorting statistics report (ECB)	Operator	This report contains all the processing data required by ECB guidelines (denomination, number and total of notes accepted and rejected) since the last sorting statistic log printout.
*Not for USA/Canada		

Type of Report	Accessibility	Report Content
Reject report	Service	Overview of the reject reasons that occurred during the banknote processing.
Version report	Service	Report with date and time for each version.
Service report	Service	Detailed report with the following information: <ul style="list-style-type: none"> ● Sensor values ● Version number of the installed adaptations ● Reject rates of the relevant installed currency ● Reject reasons ● Sorting threshold number
Ticket Report	Operator	Report of ticket IDs, date and time, accounting period, header card number, deposit data, rejections, denomination, banknote series, value and number of banknotes, quality sorting criteria.
SN List*	Operator	This report contains the list of serial numbers of the processed banknote as recognized by OCR.
PBoC*	Operator	This report contains the details of serial number of CNY (Chinese Yuan) currency.
*Not for USA/Canada		

E

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F Symbols Used

This chapter contains an overview of all the icons which appear on the user interface on the screen.

Symbol	Name	Symbol	Name
	Language		Skew
	Operator		Health
	Supervisor		Singler
	Service		Switches
	PIN		Software Package
	Cancel		Self-Test Level
	Ok		Trace Level
	Menu		System Test Fail
	Favorites		System Test status
	List		System Test Pass
	Processing speed		Raw Data Capture
	INFO		IRT Settings

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Symbol	Name	Symbol	Name
	Software Version		System Test
	Reporting		MTS Cal Install
	Export logs		Service OpMode
	Export Raw data		Coins
	Brightness		Logout
	Next		Summary
	Stackers		Reject/Unfit
	Details		Denomination
	Delta		Time
	Virtual Keyboard		Thresholds
	System Settings		Startup Errors
	Installation		Single Denomination OP Mode
	Reset		Print

Symbol	Name	Symbol	Name
	OP Details		Plus
	Multi Denomination OP mode		Machine IP
	Machine ID		Language Package
	INFO		Plus
	Next		FTP1
	FTP2		FTP3
	SNTP		Date/TimeFormat
	Strap Size active		Auto Install
	Counterfeit Rejects		3" Printer
	Server Status		Function Button 1
	Startup Errors		Function Button 2
	Peripherals		Function Button 3
	VSI		Enable Opmode Name

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F

Symbol	Name	Symbol	Name
	Disable Opemode Name		Time Zone
	SD Card		Settings
	Export Config Package		Configuration Package
	Customer ID		Deposit ID
	Amount		Strap Size

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Glossary

B

BN banknote

C

CD compact disk
digital storage medium

D

DVD digital versatile disk
digital storage medium

E

EN European standard
EU European Union (since December 1, 2009)

F

FPGA field programmable gate array

G

GS “Geprüfte Sicherheit” = “tested safety”
certification
GUI graphical user interface

I

IEC International Electrotechnical Commission
IR infrared
wave band with a wave length invisible for human
eyes

L

LED light emitting diode

M

MAG magnet sensor

O

OCR optical character recognition

OS operating system

P

PC personal computer

PD photo detector

U

USB universal serial bus

UV radiation ultraviolet radiation
 electromagnetic radiation in the range between
 100 nm and 400 nm

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