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bnr

Cashflow® Banknote Recycler

BNR
User Guide

MEI Incorporated

BNR USER GUIDE
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67061 5 044 – G1

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Cashflow® BNR - Banknote Recycler - User Guide

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VERSIONS

Version G1: First official release for customers.

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without prior notice

TABLE OF CONTENT

BNR USER GUIDE
67061 5 044 – G1

Information subject to change without prior notice

SAFETY INSTRUCTIONS

Expected using conditions: The Cashflow BNR product identifies and encashes banknotes the user inserts manually. The Cashflow BNR is intended to be integrated as peripherals within host machines.

IMPORTANT WARNING - HEAVY MATERIAL

Cashflow™ BNR can weigh more than >**25 kg (>55 lb) when completely assembled**.

SAFETY INSTRUCTIONS

Before installing the BNR into a host machine, turn off all power.
When installing or removing electronic boards observe all ESD precautions to prevent damage.

Beware of hot surfaces!

LASER SAFETY STATEMENT

This product has been tested to and is found to be in compliance with Class 1

Led/Laser product according to IEC 60825-1 «Safety standard for laser products».

STANDARDS CONFORMANCE

Cashflow BNR series products operate at Safety Extra Low Voltage level (SELV) as defined in standard EN60950-1 «Safety of information technology equipment». They may be designed into processing machines covered by this standard and complying with IEC 60950-1 or EN 60950-1.

EMC notice: this digital device does not exceed the Class A limits according to EN 55022 and IEC/CISPR 22 limits for radio interference. In a domestic environment the user may be required to take adequate measures.

4

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EC Declaration of Conformity

Document Number 20199-003110023-EC/G1

MEI herewith declares that :   **Cashflow® BNR series Banknote recyclers**

- is intended to be incorporated into machines covered by European directives.
- does comply with the provisions of the following European directives :

2004/108/EC	Electromagnetic Compatibility
2006/95/EC	Low Voltage
2002/95/EC	Restriction of Hazardous Substances - RoHS (as amended)

The products have been assessed by application of the following standards :

EN 55022 (1998)	Radiated emission for information technology equipment.
EN 55024 (1998)	EMC immunity characteristics for information technology equipment.
EN 60950-1 (2006)	Safety of information technology equipment.
UL 756 (1997)	File No.E57869 : Safety of coin and currency changers and actuators.

Our products are intended to be incorporated into automatic self-serve vending machines made by an OEM (Original Equipment Manufacturer). The latter equipment should also be declared to be in conformity with EC directives. The vending machine manufacturer integrating our module should observe the technical specifications and safety instructions supplied with the product.

Geneva, 3rd March 2009   Executive Vice-President

Jeff Allsop

1. USER GUIDE

This document is a step-by-step guide intended to help the operator to check the proper installation and start-up of a MEI Cashflow® BNR system «Banknote Recycler» into an automated payment machine. People using this document have neither tools nor the BNR Support Tool software program.

For more information on the BNR system and about other operations, see the BNR Service Manual.

Convention used in this document and in the Service Manual:

- Paragraph with the icon is intended to identify safety concerns.

- Paragraph with the icon provides helpful instructions to make the BNR easier to use.

1.1. OVERVIEW

BNR - Banknote Recycler system

The Banknote Recycler processes multi-width international "street money" with the following basic functions:
1. Denomination and Validation of street banknotes for multiple countries.
2. Temporarily store the banknotes of the current transaction (Escrow capacity 15 banknotes)
3. Give change to the consumer, using temporary stores, like Recyclers (RE) or Loader cassette (LO).
4. Store the banknotes in a permanent store, like a Cash-Box. (CB).
5. The BNR unit is powered by an external 24 VDC power supply.
6. The BNR communicates with the Host through a USB connection.

BNR USER GUIDE   67061 5 044 – G1
Information subject to change without prior notice

1.2. PRESENTATION

The BNR is composed of the following modules:
- Main Module: includes interface to the user (inlet or «bezel»), banknote validation system and a bundler
- Chassis: metallic envelope containing all the other modules with an Interlock System
- Recycler module: device for storing and dispensing banknotes
- Loader module: removeable cassette device for dispensing banknotes
- Cash-Box module: a lockable secure removable cassette

Standard Bezel version   **Safety Metal Bezel version**
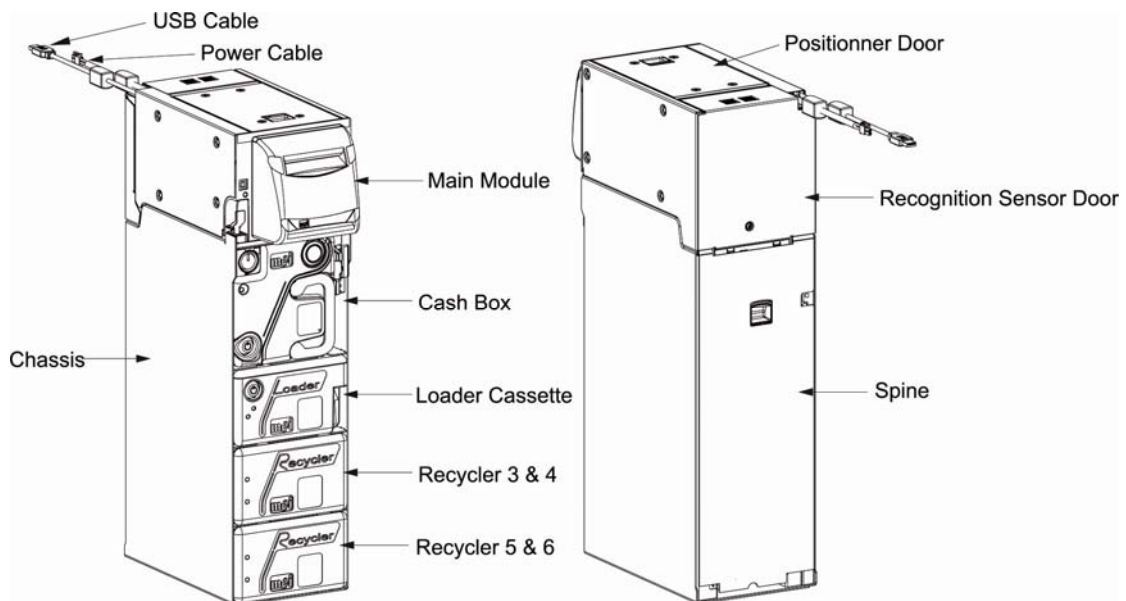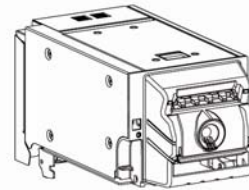
The required conditions for normal operations with the BNR are:
- Power cable and USB cable correctly connected
- Positionner door, Recognition Sensor door and Spine door correctly closed
- The Main Module correctly connected to the Spine (refer to "INSTALL THE MAIN MODULE ONTO THE CHASSIS" in Service Manual)
- Each module correctly inserted
- Interlock System correctly locked (refer to "LOCKS AND SECURITY PRINCIPE")
- The green unlocking lever completely inserted
- BNR Chassis properly linked to the local ground

7

1.3. MAIN MODULE EXTERNAL INDICATORS

External indicators are located on the
bezel.

External indicators consist of two pairs of
arrows, one pair pointing to the Inlet, the
other pair pointing to the Outlet.

Inlet arrows can be lighted in green or in
red. Outlet arrows can be lighted in
green only.

These arrows provide information about
the transaction to the user, and can also
indicate warning and failure conditions.
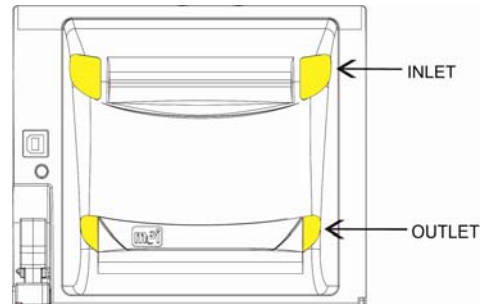
1.4. MODULES FRONT INDICATORS

Each BNR module has a front indicator
giving its status. This indicator is a green
or red LED light.

Information subject to change without
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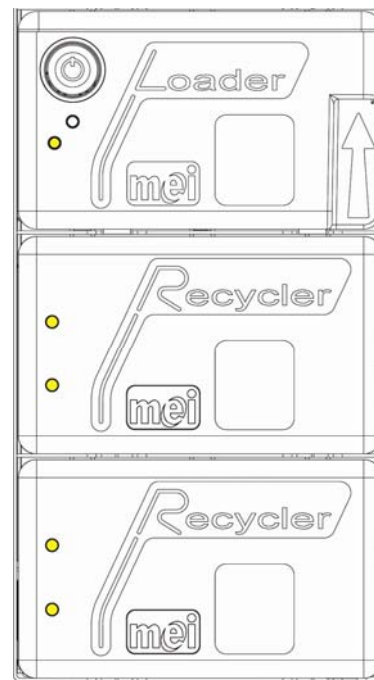
1.5. SPINE INDICATOR

The Spine has an indicator giving its status. This indicator is a green or red LED light.
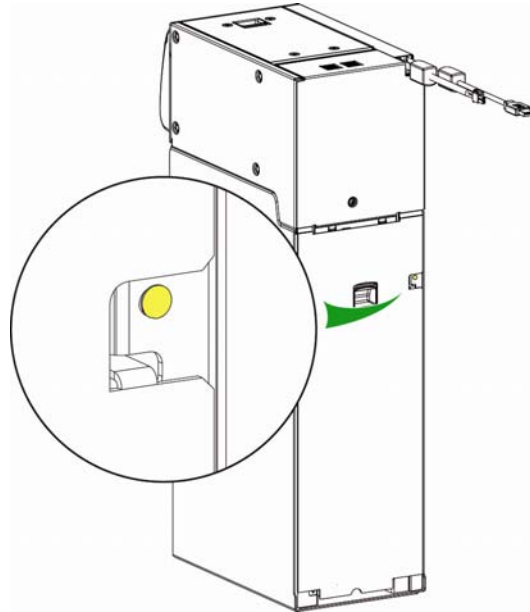
2. NORMAL OPERATIONS IN HOST MACHINE

2.1. LOCKS AND SECURITY PRINCIPLE

The BNR is secure with several locks in order to prevent unauthorised people to have access to the money:

- Interlock System
  A lock and a lever which secures all cash modules. The picture shows the Interlock System correctly locked.
  To release it, you need a key.
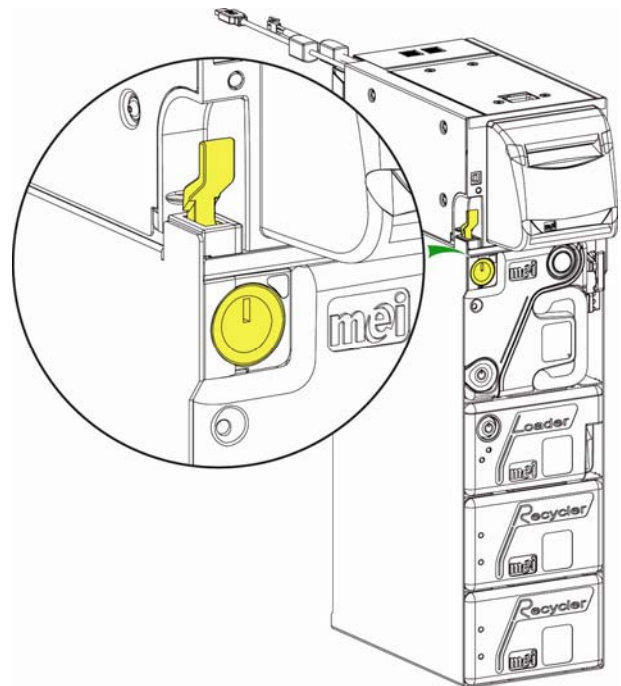
- Cash-Box
  You need to release the Interlock System to remove the Cash-Box. To open the Cash-Box it must be removed and the module must be unlocked with a key.
  The key is required to open, close and rearm it.

BNR USER GUIDE
67061 5 044 – G1
Information subject to change without prior notice
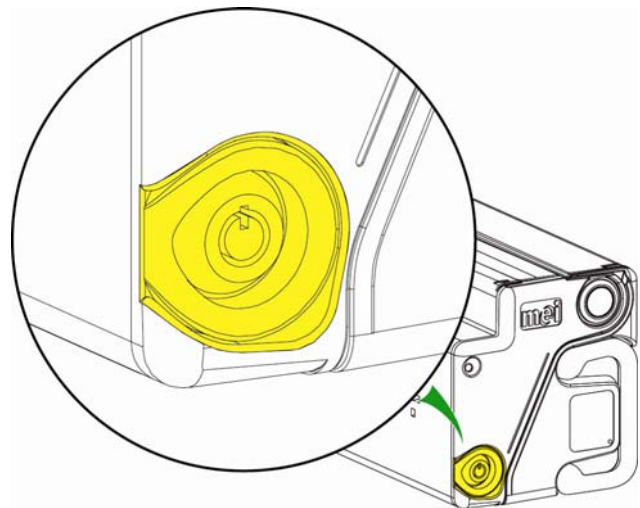
- Loader Cassette
  You need to release the Interlock System to remove the Loader. To open the Loader it must be removed and the module must be unlocked with a key.
 The key is required to open and close it.
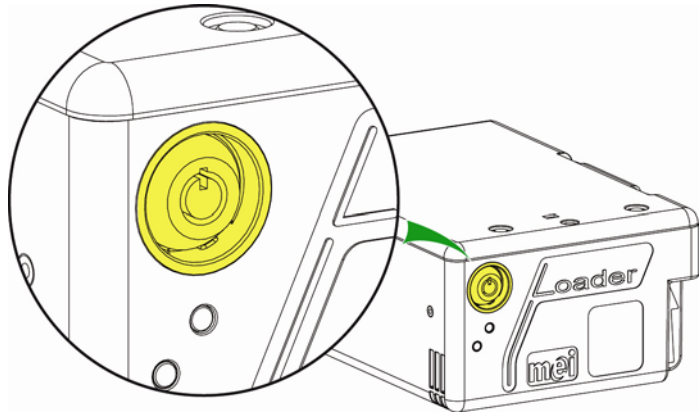
- Recycler
  Each Recycler has its own lock. To remove a Recycler, you need to release the Interlock System, remove the Loader Cassette and have a key.

  Advice : It is easier to manipulate the lock with the left hand.
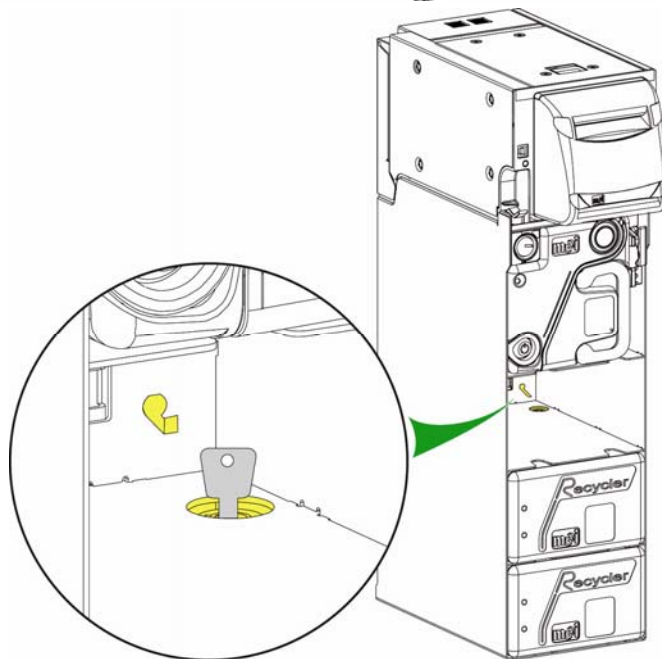
Once the Loader Cassette is removed, you can see the Recycler lock.

BNR USER GUIDE 67061 5 044 – G1
Information subject to change without prior notice
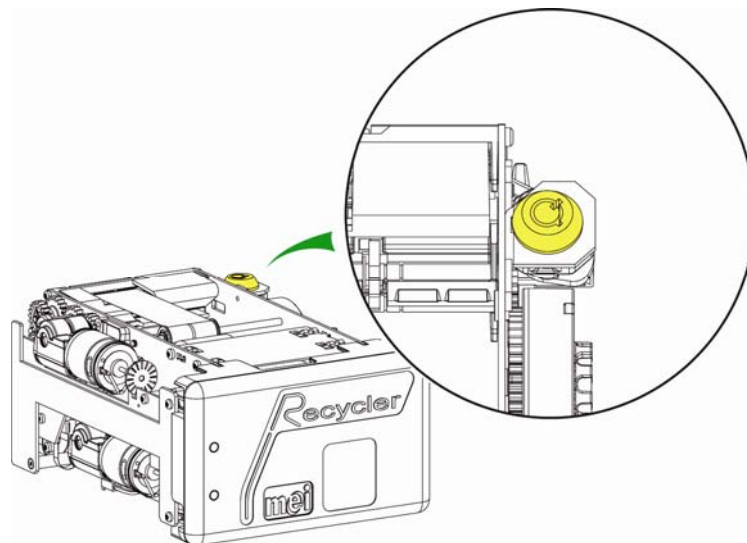
2.2. CASH-BOX HANDLING AND ARMING

To remove the Cash-Box, you need to release the Interlock System with its key.

To open and rearm the Cash-Box, you need the key of the Cash-Box.

i

Warning, the Cash-Box is a module which needs to be rearmed once removed. Make sure that you have the key or another empty Cash-Box before removing it. If you do not have the key, you will not be able to replace the same Cash-Box.
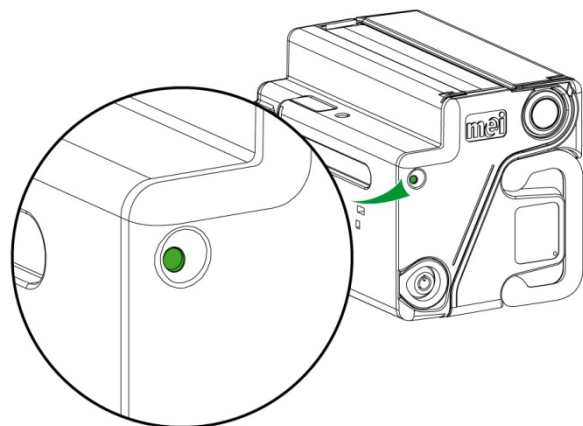
1. Release the Interlock System with lock (1) and lever (2) using the key

2. Remove the Cash-Box (3). Use the handle to remove it out.

12

BNR USER GUIDE   67061 5 044 – G1

Information subject to change without prior notice
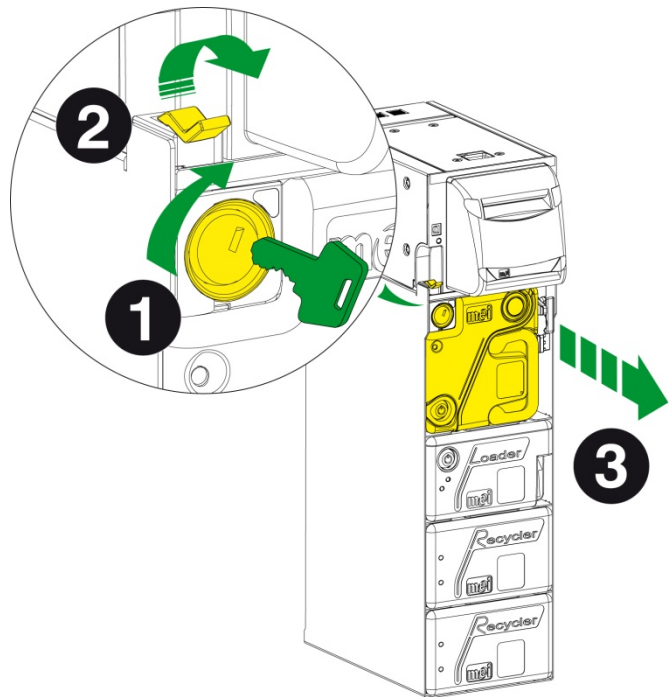
3. To open the Cash-Box, press slightly on the Cash-Box (1) to make the opening easier, push (2) and turn the key (3)

4. If banknotes are present, remove all banknotes

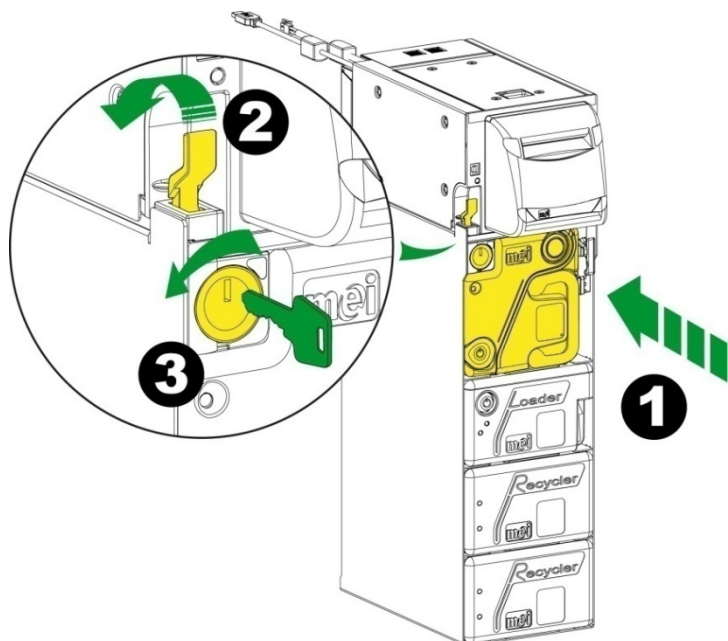5. To close the Cash-Box, press slightly the Cash-Box (1) to make the closing easier, push (2) and turn the key (3)
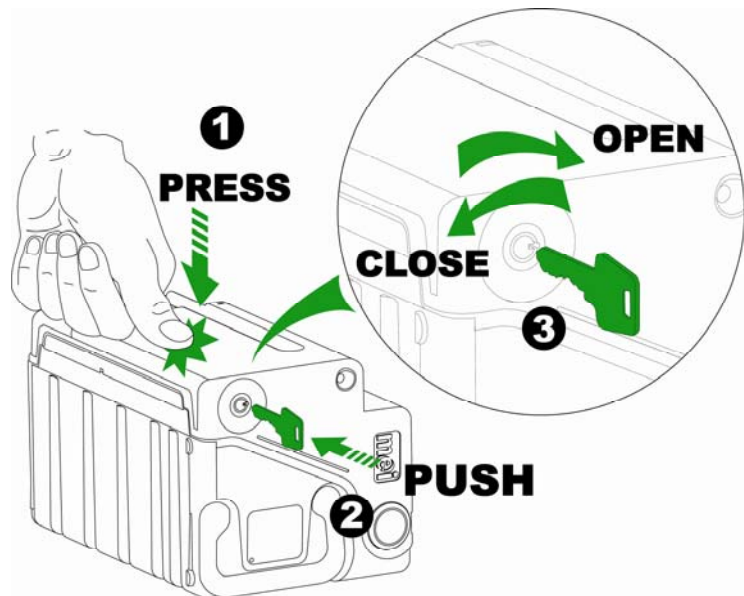
Caution, if the indicator is green the Cash-Box can be reinserted.
If the indicator is grey, the Cash-Box must be rearmed by opening it, emptying all banknotes, and then closing.

6. Install the Cash-Box (1)

   NOTE: The Cash Box can be inserted with just one finger (little pressure).
   If you cannot, make sure that the Cash-Box has no banknotes and is rearmed.

7. Lock the Interlock System with lever (2) and lock (3) using the key

BNR USER GUIDE 67061 5 044 – G1
Information subject to change without prior notice

2.3. LOADER CASSETTE HANDLING, USING AND QUALITY OF NOTE

The following instructions explain how to fill the Loader Cassette with banknotes. The Loader Cassette can work without banknotes.

Banknotes that are placed in the Loader must meet the banknote criteria detailed in Table 1.

To remove the Loader Cassette, you will need to release the Interlock System with its key. The key of the Loader Cassette is required to open and close it.
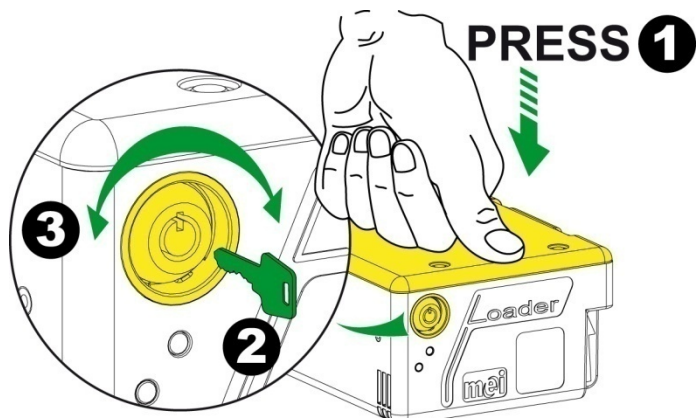
1. Release the Interlock System with lock (1) and lever (2) using the key

2. Remove the Loader Cassette (3)
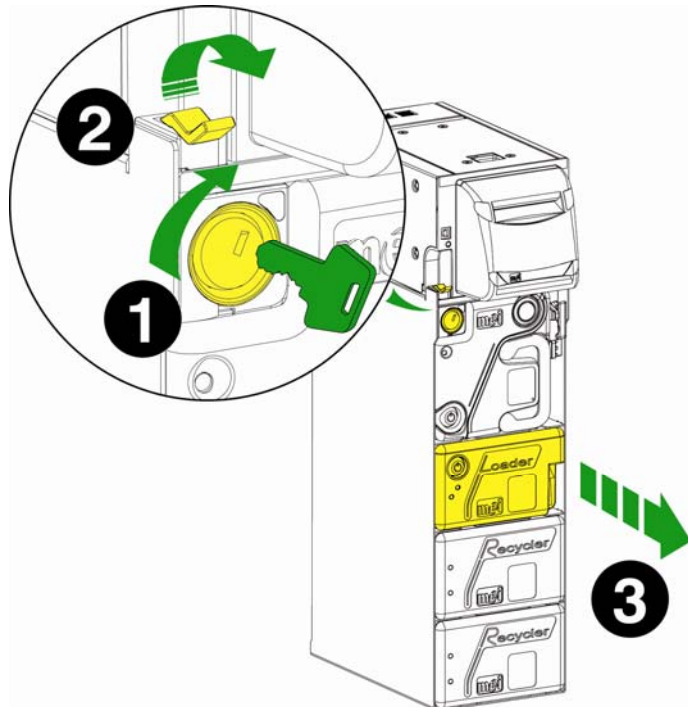
3. To open the Loader Cassette, press slightly on the box (1), insert the key (2) and fully turn the locking latch clockwise (3)

14

4. Fully open the door until it stops. Release the little yellow latch and lift the «max level detection plate».
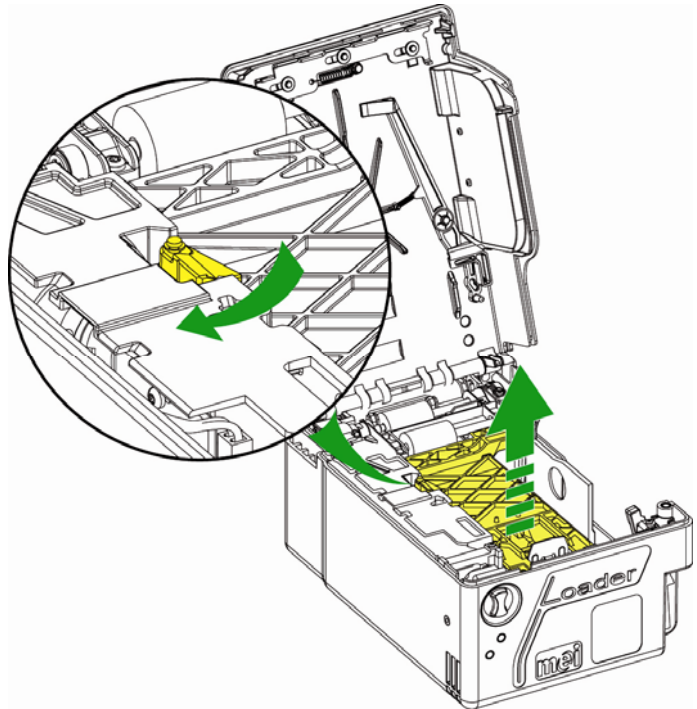
5. Push the pressure plate down to the stop. The pressure plate will lock at the bottom of the Loader Cassette.

BNR USER GUIDE
67061 5 044 – G1

Information subject to change without prior notice
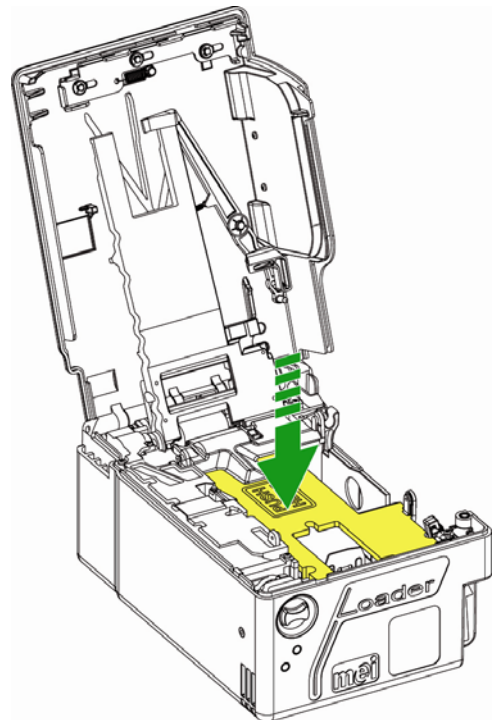
6. Lift (1) and flip (2) the lateral bill guide flap down, then place a bundle of adequate banknotes and reposition the lateral bill guide flap up.

Caution, MEI recommends to place the banknotes from the side.

NOTE: To see banknotes criteria for the Loader Cassette, refer to the Table 1

NOTE: If the Loader is not configured for the banknotes you plan to load, refer to "ADJUST LOADER CASSETTE TO BANKNOTE SIZE" in Service Manual to adjust Loader Cassette to banknotes size

16

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without prior notice
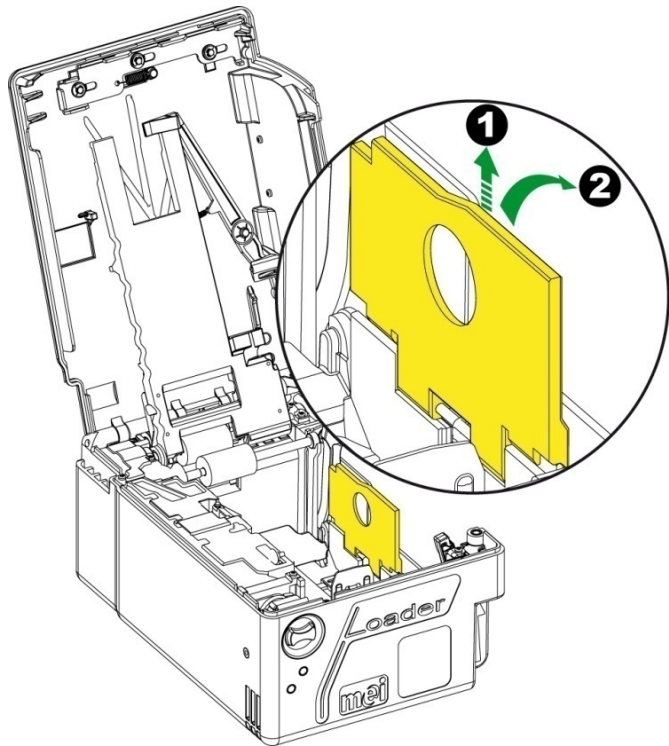
7. Reposition the «max level detection plate».
Detector flag switches to green. If red remove banknotes until the flag turns green (when the «max level detection plate» is back in position)

Caution, do not over fill the Loader Cassette and do not force the «max level detection plate» closed.
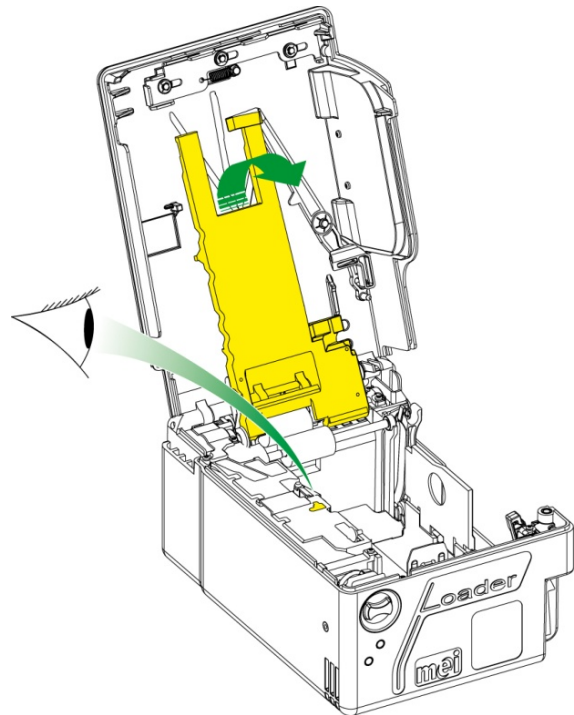
8. Close the Loader Cassette by slightly pressing the box (1), inserting the key (2) and slightly turning it clockwise (3), and then fully turn the key vertical in order to release the pressure plate mechanism.
A "clack" will occur after the key is turned vertical and ensures that the Loader Cassette is correctly closed.

PRESS ❶
Clack !
❸ ❷

BNR USER GUIDE   67061 5 044 – G1
Information subject to change without prior notice
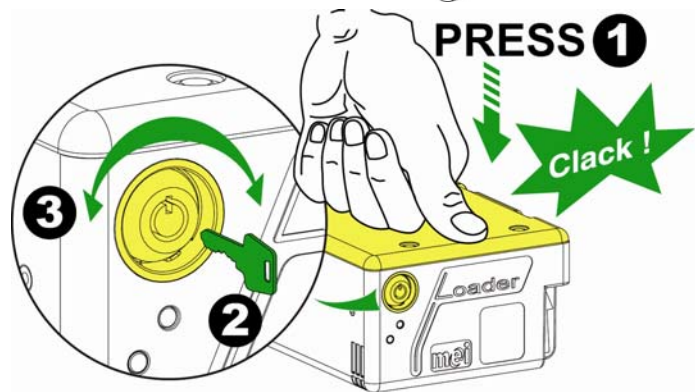
9. Put the Loader Cassette back in place (1)

10. Lock the Interlock System with lever (2) and lock (3) using the key
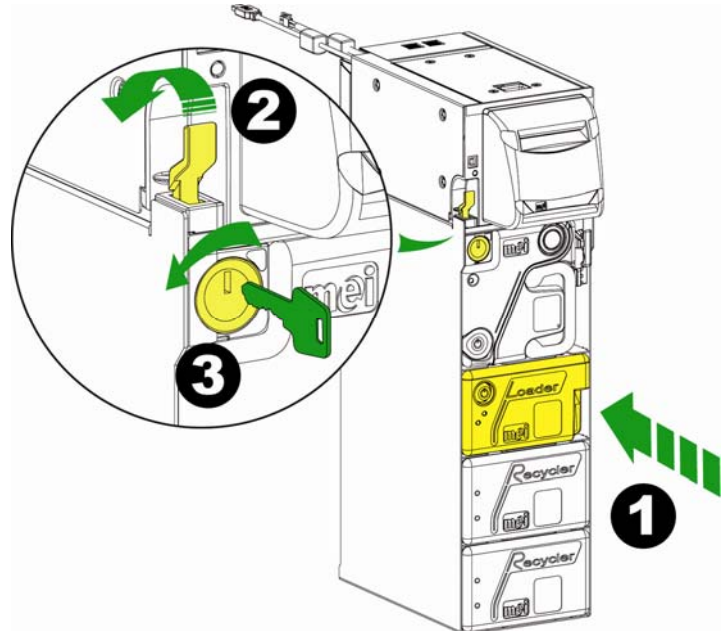
Table 1: Capacity and banknote quality for the Loader Cassette

Maximum number of banknotes	250 +/- 50 notes
	Varies depending on the currency, the state of the banknotes and the climatic conditions.
Banknote width acceptance	Min. 60 mm to max. 81 mm (nominal) (+1 / -2 mm)
Banknote length acceptance	Min. 120 mm to max. 176 mm (nominal) (+1 / -2 mm)
Condition of banknotes accepted	Cannot contain any of the following conditions: • More than 25% of the length of the border missing or folded • Holes, tears, folds • Writing, stains, spots, or stamps larger than 100mm^2 • Tape, staples, pins, foreign matter attached to the banknote • Machine washed • Excessively worn, limp or wrinkled • Two or more banknotes stuck together • Wet or damp banknotes

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without prior notice

2.4. CONFIGURATION THROUGH HOST MACHINE

The Host Machine may configure the BNR depending on the operator requirements.

For example:
- Enable or disable banknotes (active or inhibit): some banknotes could not be accepted because of their denomination (too low or too high denomination)
- Loader: choice of denominations and number of banknotes filled by the operator or stored by the BNR in the Loader Cassette
- Recyclers: choice of recycled denominations, floating (number of banknotes in a recycler,...)

For more information, refer to the instructions of Host machine.

BNR USER GUIDE 67061 5 044 – G1
Information subject to change without prior notice

2.5. BNR SWITCH-ON

When the BNR is powered up process you can see:

- Inlet arrows BLINKING RED
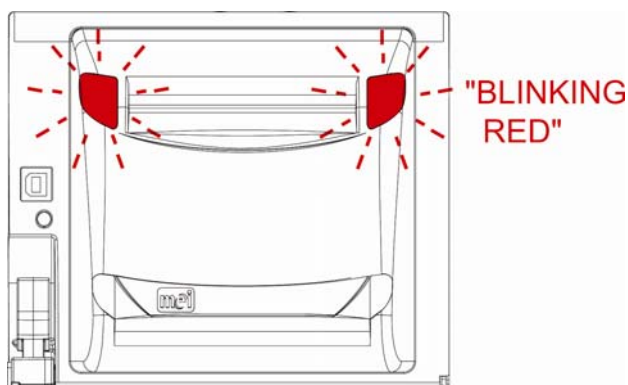
- Then 15 sec. later, Inlet and Outlet Arrows BLINKING GREEN
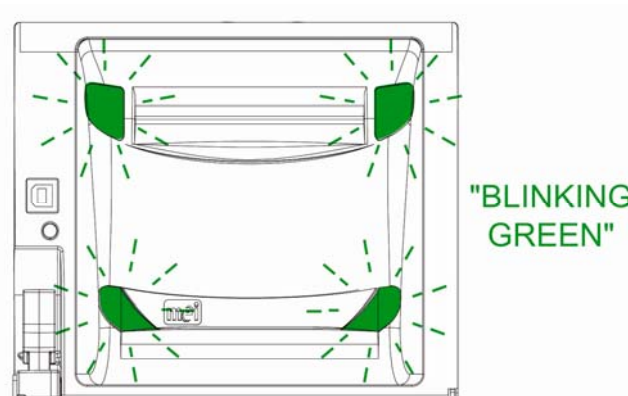
- Finally all LED's of all modules SLOWLY BLINKING GREEN

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without
prior notice

BLINKING GREEN
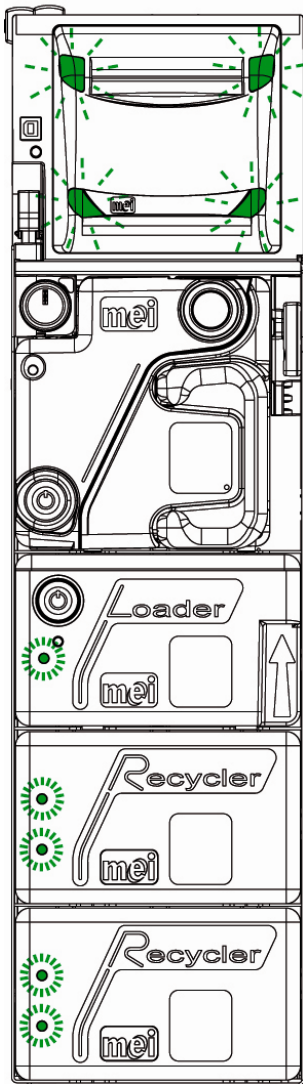
"BLINKING GREEN"
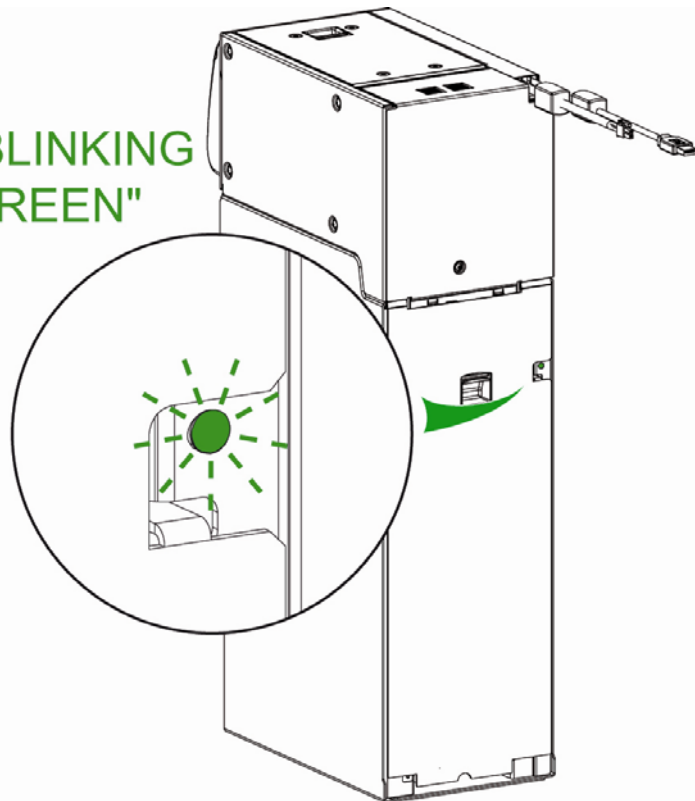
In this state a BNR Reset is required to bring the unit on-line.

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without
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2.6. BNR RESET

The reset sequence of the BNR takes approximately 15 to 25 seconds. It is dependent on the BNR configuration (number of modules). Reset automatically tests the BNR's electro-mechanical system for a failure or banknote in the transport system. If a banknote is found, it will be send in the Cash-Box.

NOTE: The first Reset cycle may be longer than 25 sec. approx. 1min30 sec. (rewind Recycler tape)

An empty Loader Cassette could have a red LED

During the reset sequence:

- You will hear noise from motors, belts and contactors from the BNR

- You will see module LED's BLINKING GREEN SLOWLY.

BNR USER GUIDE
Information subject to change without prior notice
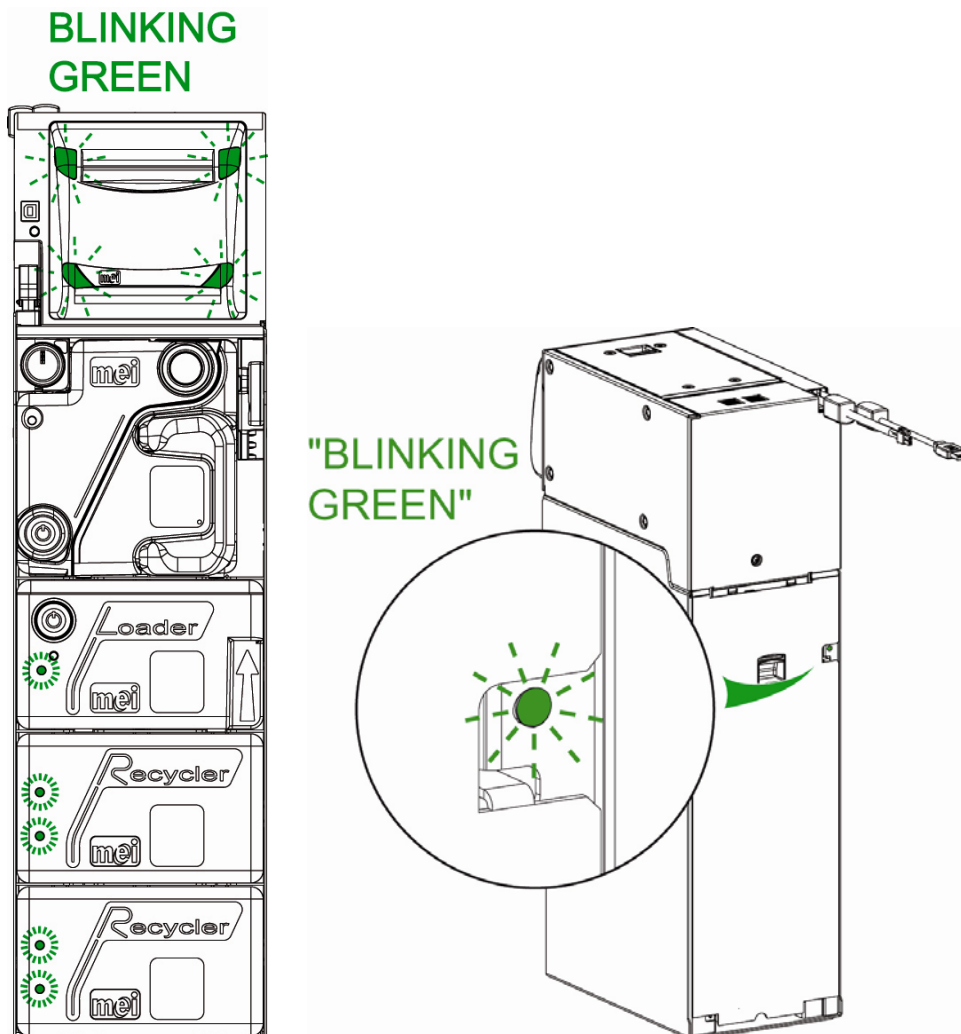
After resetting, the Inlet arrows lights turn off and all modules LED's will be SOLID GREEN
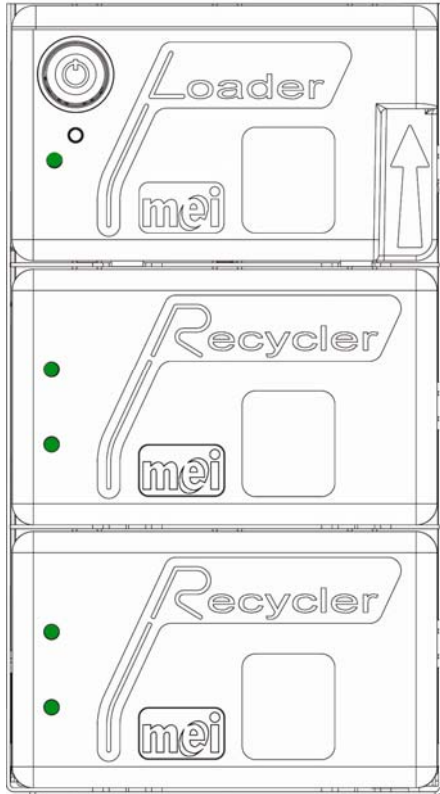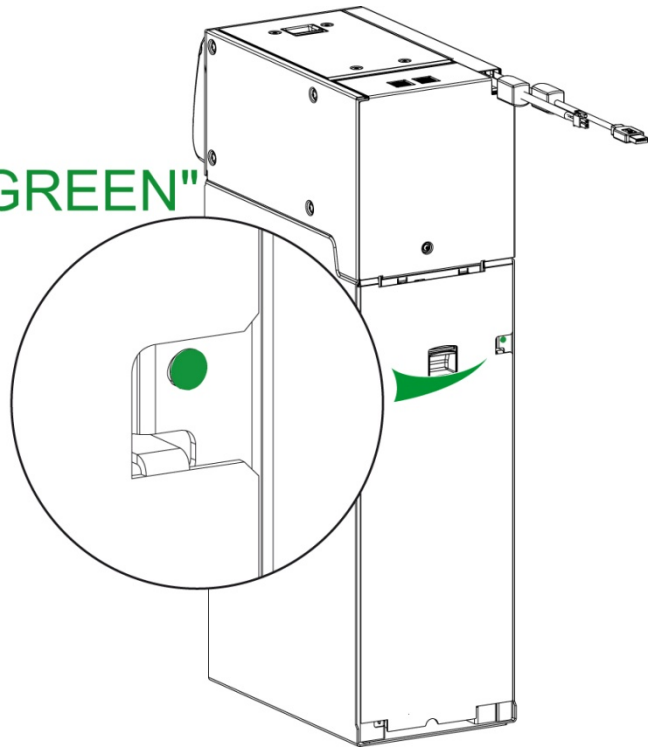
If the reset sequence does not begin, make sure that:
- Power cable and USB cable are correctly connected
- Positionner door, Recognition Sensor door and Spine door are correctly closed (refer to "USER GUIDE – PRESENTATION")
- Each module is correctly inserted
- Interlock System is correctly locked (refer to "LOCKS AND SECURITY PRINCIPLE")
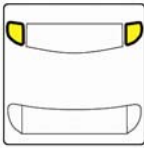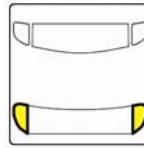
If one or several modules LED's do not turn to solid green, refer to "BASIC TROUBLESHOOTING"

BNR USER GUIDE
Information subject to change without prior notice

NOTES:

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without
prior notice
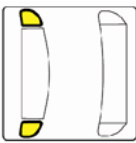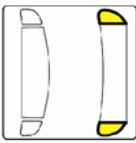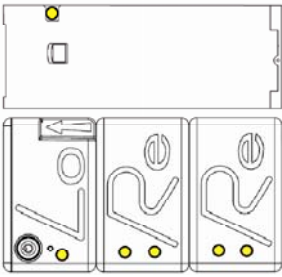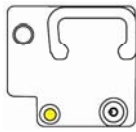
2.7. BEZEL LED'S INDICATORS

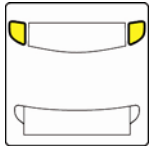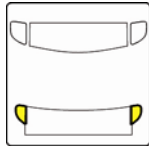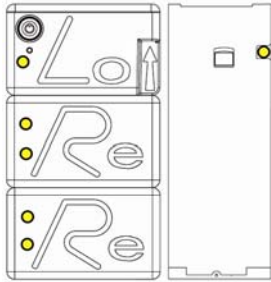|		System / Module Status	You have to
Off	Off	Insertion disabled	Take no action
GREEN	Off	A banknote can be inserted	Insert a banknote
GREEN	Off	A banknote returned to the Inlet	Pull the banknote out
Off	GREEN	Banknote are given out at the Outlet	Withdraw the banknotes

BNR USER GUIDE
Information subject to change without prior notice

3. BASIC TROUBLESHOOTING

The basic troubleshooting is made by observing the several indicators of the BNR's modules. This troubleshooting is valid for the Firmware version 1.0.0.

You need to		Take no action	After Switch-on, have the BNR to "Reset"	Take no action (CB ready to insert)	Fill the Loader Cassette with banknotes	Configure the Module	Clear the Jam, refer to "EASY JAM CLEARING" or Service Manual	Require a "Reset" command	Empty the CB, rearmed it, refer to "CASH-BOX HANDLING"
System / Module Status		Locked	Reset required	Operational	Bill Storage not OK (Loader only)	Cash type Status not OK (Re, Lo)	Remove Bill in Transport (jam, stopped, bill error)	Not Operational (wrong module, OOS, transport error)	Cash-Box full or not rearmed
External Indicator – FW version 1.0.0	module 1	-	-	-	-	-	-	-	GREY
	module 2	Off	GREEN x1	GREEN	RED Slow (2 sec.)	RED Fast (3 per sec)	RED x3 Fast	RED	-
	module 3	Off	GREEN x1	Off	Off	Off	Off	Off	-
	module 4	Off	GREEN x1	Off	Off	Off	RED x3 Fast	RED	-

BNR USER GUIDE

67061 5 044 – G1

Information subject to change without prior notice

4. OLD BASIC TROUBLESHOOTING

The basic troubleshooting is made by observing the several indicators of the BNR's modules. This troubleshooting is valid for the Firmware version 0.10.X.

External indicators – FW version 0.10.X				System / Module Status	You need to
-	-	Not defined	-	Locked	Take no action
RED ●	Off	RED ●	-	Not Operational *(wrong module, OOS, transport error)*	-
				Reset Required	Do a "Reset" command
RED ☼ x3 Fast	Off	RED ☼ x3 Fast	-	Remove Bill in Transport *(jam, stopped, bill error)*	Clear the Jam, refer to "EASY JAM CLEARING" or "ADVANCED JAM CLEARING" in Service Manual
Off	Off	GREEN ☼ x1	-	Operational	Take no action
-	-	-	GREY ●	Cash-Box full or not rearmed	Empty the CB or rearmed it, refer to step 2.4

BNR USER GUIDE   67061 5 044 – G1
Information subject to change without prior notice

5. EASY JAM CLEARING

It may happen that a banknote is jammed in the BNR.

The following cases of jammed banknotes are easy to clear.

For more difficult cases of jammed banknotes, refer to "ADVANCED JAM CLEARING" in Service Manual.

5.1. IN THE SPINE

1. Open the Spine door: lift and hold up the yellow button and pull the door
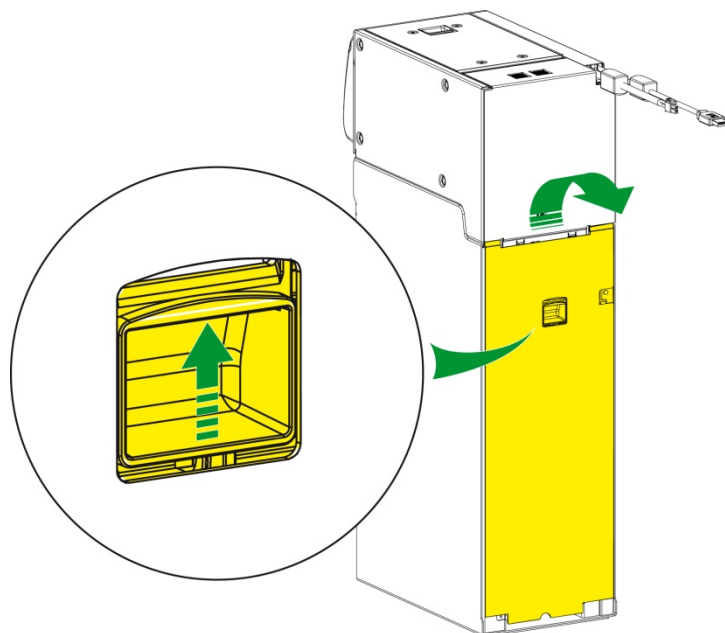
2. Carefully withdraw the banknote, take care that the banknote does not fall behind the BNR

3. Close the Spine door

67061 5 044 – G1

Information subject to change without prior notice

5.2. IN THE RECOGNITION SENSOR

1. Open the Recognition Sensor door. Push on the two yellow buttons and pull the door
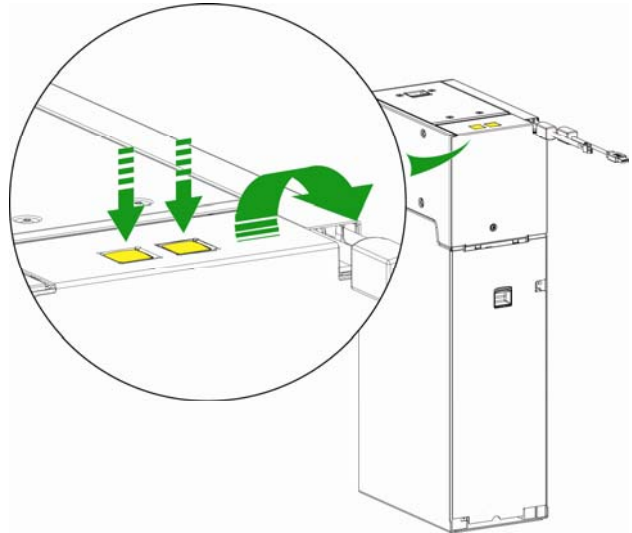
2. Carefully withdraw the banknote

3. Close the Recognition Sensor door

5.3. IN THE RECOGNITION SENSOR TO SPINE INTERFACE

1. Open the Spine door. Lift and hold up the yellow button and pull the door

2. Open the Recognition Sensor door. Push on the two yellow buttons and pull the door
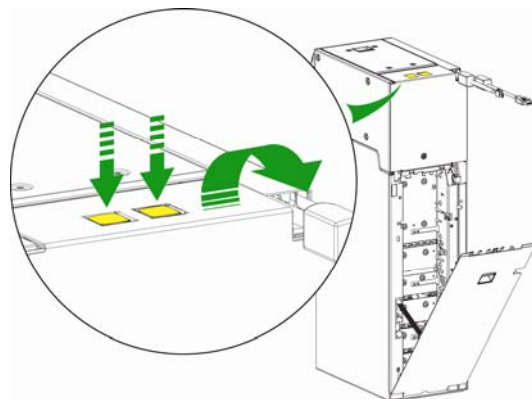
3. Carefully withdraw the banknote

4. Close the Recognition Sensor Door first and finally the Spine door

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without prior notice

5.4. IN THE POSITIONNER, AT THE INLET

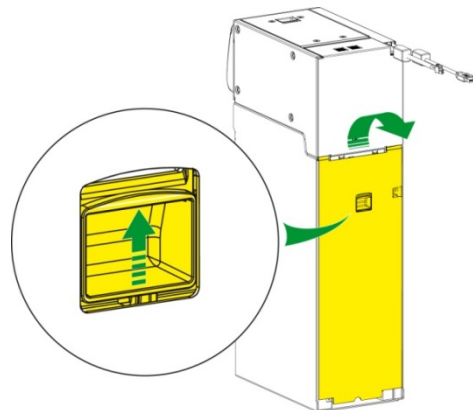1. Open the Spine door, then open the Recognition Sensor door, and finally open the Positionner door. Lift and hold up the yellow button and pull the door

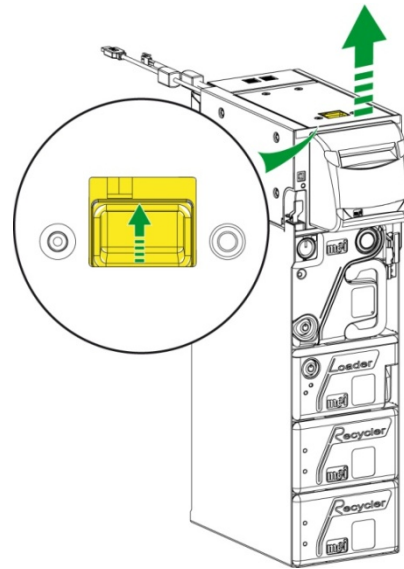2. Carefully withdraw the banknote

3. Close the Positionner door, close the Recognition Sensor door and finally close the Spine door

5.5. IN THE LOADER CASSETTE

1. Open the Spine door to check if the banknote is jammed in exiting the Loader
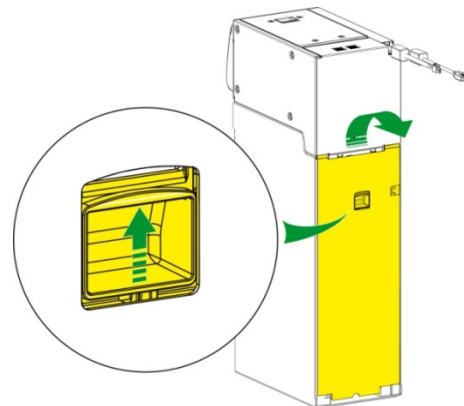
2. If you see the banknote, carefully withdraw it

3. If you don't see the banknote, close the Spine door

4. Remove and then open the Loader Cassette, refer to "LOADER CASSETTE HANDLING"

5. Carefully withdraw the banknote

6. Close and install the Loader Cassette, refer to "LOADER CASSETTE HANDLING"

BNR USER GUIDE 67061 5 044 – G1

Information subject to change without prior notice

NOTES

BNR USER GUIDE
Information subject to change without
prior notice
67061 5 044 – G1

ERROR REPORT

N°:

RMA N°:

Name of company :

Date of intervention : _____ Time : _____

Name of person on duty : _____

BNR Type : _____ N° : _____ Version : _____

N° Main Module : _____ N° Chassis : _____

Host machine Type : _____ N° : _____ Version : _____

Location : _____ Position : _____

REPORT

Diagnostic (file name) ☐ _____
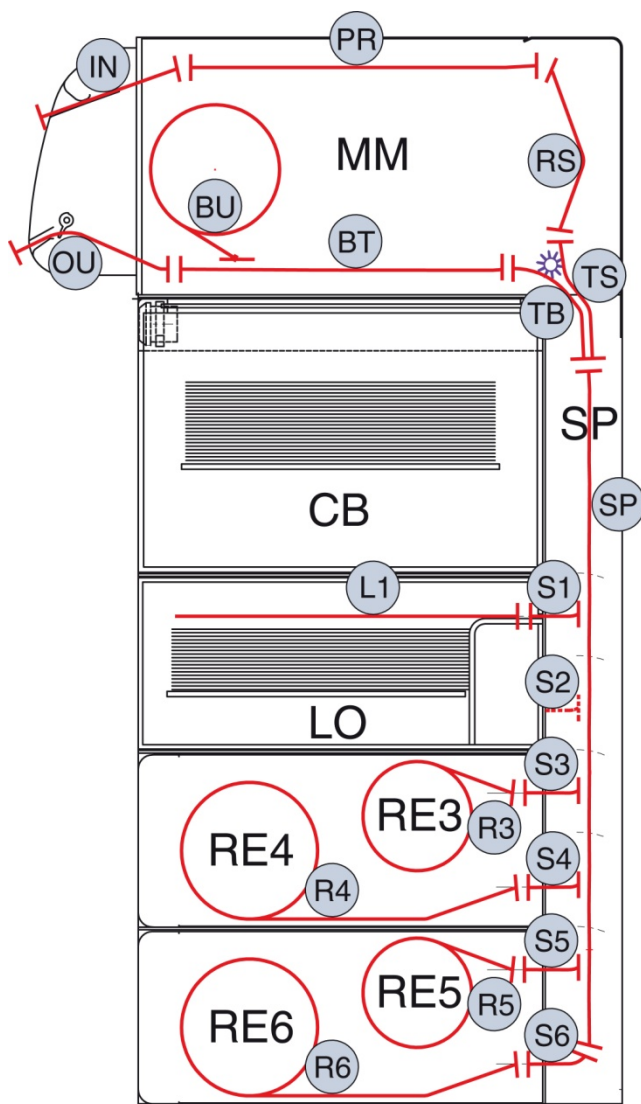
Pictures (file name) ☐ _____

Problem reported : _____

Problem found : _____

External aspect : _____ Vandalism : YES ☐

Work carried out : _____

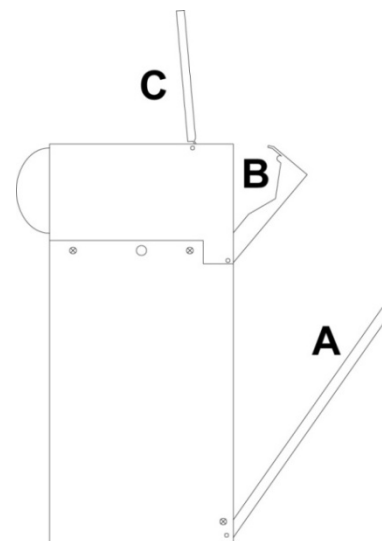**Repair status :** Error cleared ☐ Error not cleared ☐ Unit exchanged ☐

32

Area	
IN	
OU	
PR	
RS	
TS	
TB	
BT	
BU	
SP	
S1	
S2	
S3	
S4	
S5	
S6	
L1	
R3	
R4	
R5	
R6	

Opening order

Note	
Stopped	
Jammed (crumpled)	

Belts off		
Yes		No	

Condition of the note			
Old		Dirty	
Limp		Taped	
New		Clean	
Stiff		Torn	
Folded, dog-eared			
Wet			

Flashing →	N	1	2	3	S	R	G
Main Module							
Cash-Box							
Spine							
Loader							
Recycler 3							
Recycler 4							
Recycler 5							
Recycler 6							

« S » = Solid « R » = Red « G » = Green

« N » = Not flashing

Module removed	
MM - Main Module	
MSN : _____	
CB - Cash-Box	
MSN : _____	
SP - Spine	
MSN : _____	
LO - Loader Cassette	
MSN : _____	
RE-3&4 - Recycler	
MSN : _____	
RE-5&6 - Recycler	
MSN : _____	

33

BNR USER GUIDE   67061 5 044 – G1

Information subject to change without prior notice