Published by:

CPI | Crane Payment Innovations
P.O. Box 2650
CH-1211 Geneva 2
Switzerland

MEI® BNR&BNA6 - Banknote Recycler – Banknote acceptor - User Guide

© 2009-2017 CPI. All rights reserved

MEI® and the MEI logo are registered trademarks. Except as permitted under the relevant local legislation, no part of this publication may be copied, transmitted, transcribed or distributed in any form or by any means, or stored in a database or retrieval system, or translated into any language (natural or computer) without the prior written permission of CPI. CPI reserves the right to change the product specifications at any time. While every effort has been made to ensure that the information in this publication is accurate, CPI disclaims any liability for any direct or indirect losses (howsoever caused) arising out of use or reliance on this information. This document does not necessarily imply product availability.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>67061-5-044-G6</th>
</tr>
</thead>
<tbody>
<tr>
<td>This edition</td>
<td>September 2017</td>
</tr>
<tr>
<td>ECN Number</td>
<td>5 000 000 20332</td>
</tr>
<tr>
<td>FILE REF</td>
<td>67061 5 044_BNR&amp;BNA6 USER GUIDE_G6</td>
</tr>
</tbody>
</table>

VERSIONS

Version G1
First official release for customers.

Version G2
Chapter 4 Old Basic Troubleshooting removed
New labels added

Version G3
Introducing New interlock system (IS V.8). Introducing chapter 5 "Recommended preventative maintenance". Introducing appendices with, Bezel, Cashbox and BNR range. Updating cover page with full gray BNR. Global review.

Version G4
Version G5
Updating chapter 5.1 BNR RECOMMENDED MAINTENANCE PLAN.
Introducing a detailed maintenance table module by module.

Version G6
Merging BNR and BNA6 series User guides into one document.
# TABLE OF CONTENTS

SAFETY INSTRUCTIONS ........................................................................................................ 6  
STANDARDS CONFORMANCE ............................................................................................... 6

1. USER GUIDE .................................................................................................................. 9
   1.1. OVERVIEW ................................................................................................................. 9
   1.2. PRESENTATION .......................................................................................................... 10
   1.3. MAIN MODULE EXTERNAL INDICATORS ................................................................. 12
   1.4. MODULES FRONT INDICATORS ................................................................................ 13
   1.5. SPINE INDICATOR ..................................................................................................... 14

2. NORMAL OPERATIONS IN HOST MACHINE .............................................................. 14
   2.1. LOCKS AND SECURITY PRINCIPLE ....................................................................... 14
   2.2. CASH-BOX HANDLING AND ARMING ................................................................. 17
   2.3. LOADER CASSETTE HANDLING, USING AND QUALITY OF BANKNOTE .......... 19
   2.4. CONFIGURATION THROUGH HOST MACHINE ..................................................... 24
   2.5. BNR/BNA6 POWER UP ............................................................................................. 25
   2.6. BNR/BNA6 RESET ................................................................................................... 27
   2.7. BEZEL LED’S INDICATORS ....................................................................................... 29

3. BASIC TROUBLESHOOTING ......................................................................................... 30

4. EASY JAM CLEARING ..................................................................................................... 31
   4.1. IN THE SPINE ............................................................................................................ 31
   4.2. IN THE RECOGNITION SENSOR .............................................................................. 32
   4.3. IN THE RECOGNITION SENSOR TO SPINE INTERFACE ....................................... 33
   4.4. IN THE POSITIONER, AT THE INLET ....................................................................... 34
   4.5. IN THE LOADER CASSETTE .................................................................................... 35
   4.6. AT THE CASH-BOX PUSHER PLATE ..................................................................... 36

5. RECOMMENDED PREVENTATIVE MAINTENANCE .................................................. 37
   5.1. BNR/BNA6 RECOMMENDED MAINTENANCE PLAN ............................................ 37
   5.2. BNR Bill path cleaning instructions ......................................................................... 44
   5.3. BNR Loader cleaning instructions ............................................................................ 51

ERROR REPORT ..................................................................................................................... 56
NOTES:
SAFETY INSTRUCTIONS

Expected use conditions: The MEI BNR/BNA6 products validate, denominate, store and recycle banknotes. The MEI BNR/BNA6 is intended to be integrated as a peripheral within a Host Machine.

IMPORTANT WARNING - HEAVY MATERIAL
MEI™ BNR/BNA6 can weigh more than >25 kg (>55 lb) when completely assembled.

SAFETY INSTRUCTIONS
Before installing the BNR/BNA6 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!

STANDARDS CONFORMANCE
MEI BNR/BNA6 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 B 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.
EC Declaration of Conformity

Document Number 20100-0011-0023 EC/GS

CPI, herewith declares that: MEI BNR series Banknote recycler

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

2011/65/EU Electromagnetic Compatibility
2014/35/EU Low Voltage
2011/65/EU Restriction of Hazardous Substances (RoHS)

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

EN 55022 (2010) : Radiated emission for information technology equipment: Class B.
EN 55024 (2010) : EMC immunity characteristics for information technology equipment.
&

Our products are intended to be incorporated into automatic self-service 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, February 2016

Executive Vice President Transport

Mary K. Rumpf
EC Declaration of Conformity

Document Number 955601001/G1

MEI herewith declares that:

- 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
  2011/65/EU Restriction of Hazardous Substances (RoHS)

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

EN 55022 (2010) : Radiated emission for information technology equipment: Class B.
EN 55024 (2010) : EMC immunity characteristics for information technology equipment.

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, 31st October 2012

Executive Vice President Transport

Jeff Allsop
1. USER GUIDE

The intent of this document is to familiarize an Operator with the basic functions of the MEI BNR/BNA6 <Banknote Recycler/Acceptor>, to ensure the product is installed properly and to perform simple product upkeep. This manual does not discuss any product maintenance that requires tools or additional software. For more information on the BNR/BNA6 and about other operations, see the BNR&BNA6 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/BNA6 easier to use.

1.1. OVERVIEW

BNR/BNA6 - Banknote Recycler/Acceptor

The BNR/BNA6 processes multi-width international “street money” with the following basic functions:

1. Denomination, Validation and Acceptance of street banknotes for multiple countries,
2. Temporarily store the banknotes of the current transaction (Escrow capacity 15 banknotes),
3. Provide change to the consumer from temporary cash stores held in the Recyclers (RE) or Loader Cassette (LO) modules,
4. Store the banknotes in a permanent store, at the Cash-Box module (CB),
5. The BNR/BNA6 is powered by an external 24 VDC power supply, not included.
6. The BNR/BNA6 communicates with the Host Machine through a USB connection.
1.2. PRESENTATION

The BNR/BNA6 is composed of the following modules:
- Main Module: includes interface to the User (Inlet or “Bezel”), banknote validation system and a Bundler,
- Chassis: metal frame containing all the other modules with an Interlock System,
- Recycler module: device for storing and dispensing banknotes,
- Loader module: removable cash storage cassette for dispensing banknotes,
- Cash-Box module: a lockable secure removable cash storage cassette.

The product variant depicted within this manual is the BNR4 version. Please note that various versions of the MEI BNR are available, along with different cashbox and bezel types. For further information please refer to Appendices at the end of this document.

Standard Bezel version

Example of a BNR4-21
Example of a BNA6-L

The required conditions for normal operations of the BNR/BNA6 are:

- Power cable and USB cable correctly connected,
- Positioner 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 the BNR&BNA6 Service Manual),
- Each module correctly inserted,
- Interlock System correctly locked (refer to “LOCKS AND SECURITY PRINCIPLE” in the “NORMAL OPERATIONS IN HOST MACHINE” chapter),
- The green unlocking lever is inserted completely,
- BNR/BNA6 Chassis properly linked to the local ground,
- BNR/BNA6 and Host machine are powered up and BNR/BNA6 is reset.
1.3. MAIN MODULE EXTERNAL INDICATORS

External indicators are located on the Bezels.

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

Inlet arrows can be illuminated green or red. Outlet arrows can be illuminated 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/BNA6 module has front located LED indicators giving its status. Each LED will illuminate green or red depending on the module status.
1.5. SPINE INDICATOR

The Spine has a LED indicator that provides its status. This indicator will illuminate green or red.

2. NORMAL OPERATIONS IN HOST MACHINE

2.1. LOCKS AND SECURITY PRINCIPLE

The BNR/BNA6 can be secured with several locks to prevent unauthorised access to the stored 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.
  Once the cash-box is removed, it must be opened and emptied before it can be reinstalled in the BNR/BNA6. The key is required to open, close and rearm it.

Cash-box S

Cash-Box M

Cash-box L
• Loader Cassette,
  You need to release the Interlock System to remove the Loader Cassette. To open the Loader Cassette it must be removed and the module must be unlocked with a key. The key is required to open and close it.

• Recycler,
  To remove a Recycler, you need to release the Interlock System and remove the Loader Cassette. Recyclers are locked in place with keys. Refer to the BNR&BNA6 Service Manual to remove the Recyclers.

Once the Loader Cassette is removed, you can see the Recycler lock.
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.

**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) by pulling it away from the BNR/BNA6 with the yellow handle.

3. To open the Cash-Box, press slightly on the Cash-Box (1), insert the key fully into the lock (2) and turn (3) left (counter-clockwise).

4. Do not remove the key from the lock and open the Cash-Box. If banknotes are present, remove all banknotes.

5. To close the Cash-Box, press the Cash-Box closed at (1), turn the key (3) right (clockwise).
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 should install into the BNR/BNA6 with little force. If the cash-box does not sit flush in the BNR/BNA6, first check that the interlock lever is unlocked and then check the Cash-Box arming indicator to ensure it is green. If it is not green, the Cash-Box will need to be rearmed by opening, emptying and closing.

7. Lock the Interlock System with lever (2) and lock (3) using the key.
2.3. LOADER CASSETTE HANDLING, USING AND QUALITY OF BANKNOTE

The following instructions explain how to fill the Loader Cassette with banknotes. Banknotes that are placed in the Loader Cassette 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).
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.
6. Lift (1) and flip (2) the lateral bill guide flap down. Ensure notes to be used in the loader meet all requirements of fitness in Table 1, then place a bundle of less than 250 banknotes into the loader. Reposition the lateral bill guide flap up.

**Caution**, CPI 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 the BNR&BNA6 Service Manual to adjust Loader Cassette to banknotes size.
7. Reposition the “max level detection plate”. With the max level detection plate down, check that the bill level flag is green. If the flag shows red remove some bills until the flag turns green with the detection plate down.

**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 “click” will occur after the key is turned vertical and ensures that the Loader Cassette is correctly closed.

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

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum number of banknotes</strong></td>
<td>250 +/- 50 notes</td>
<td>Varies depending on the currency, the state of the banknotes and the climatic conditions.</td>
</tr>
<tr>
<td><strong>Banknote width acceptance</strong></td>
<td>Min. 60 mm to max. 81 mm (nominal) (+1 / -2 mm)</td>
<td></td>
</tr>
<tr>
<td><strong>Banknote length acceptance</strong></td>
<td>Min. 120 mm to max. 176 mm (nominal) (+1 / -2 mm)</td>
<td></td>
</tr>
<tr>
<td><strong>Condition of banknotes accepted</strong></td>
<td>Cannot contain any of the following conditions:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• More than ¼ of the length of the border missing or folded,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Holes, tears, folds,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Writing, stains, spots, or stamps larger than 100mm²,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tape, staples, pins, foreign matter attached to the banknote,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Machine washed,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Excessively worn, limp or wrinkled,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Two or more banknotes stuck together,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Wet or damp banknotes.</td>
<td></td>
</tr>
</tbody>
</table>
2.4. CONFIGURATION THROUGH HOST MACHINE

The Host Machine may configure the BNR/BNA6 depending on the operator requirements.

For example:

- Enable or disable specific denominations or series of banknotes (active or inhibit).
- Loader Cassette: 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 and starting float level.

For more information, refer to the instructions provided by the Host machine manufacturer.
2.5. BNR/BNA6 POWER UP

When the BNR/BNA6 is powered up it performs a self-test process and displays the following:

- Inlet arrows alternately BLINKING RED,

![Blinking red]

- Then 15 seconds later, Inlet and Outlet Arrows BLINKING GREEN,

![Blinking green]

- Finally all LED’s of all modules SLOWLY BLINKING GREEN.
In this state a BNR/BNA6 “Reset” is required to bring the unit ON-LINE.
2.6. BNR/BNA6 RESET

The reset sequence of the BNR/BNA6 takes approximately 15 to 25 seconds. It is dependent on the BNR/BNA6 configuration (number of modules). Reset automatically tests the BNR/BNA6’s electro-mechanical system for a failure or banknote in the transport system. If a banknote is found, it will be sent to the note to the Cash-Box.

NOTE: The first Reset cycle may take up to 1 minute 30 seconds.
If the Loader Cassette is empty, its LED indicator will blink Red. This will not affect the BNR readiness to accept cash.

During the reset sequence:

- You will hear running of the transport motors, belts and diverters being tested inside the BNR/BNA6.

- You will see module LED’s BLINKING GREEN SLOWLY.
After resetting, the Main Module arrows lights turn off and all modules LED’s will be SOLID GREEN.

If the reset sequence does not begin, make sure that:
- The Power cable and USB cable are correctly connected,
- Positioner door, Recognition Sensor door and Spine door are correctly closed (refer to “PRESENTATION” in the “BNR&BNA6 USER GUIDE” chapter),
- 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”.

Solid green
### 2.7. BEZEL LED’S INDICATORS

<table>
<thead>
<tr>
<th>Status</th>
<th>System / Module Status</th>
<th>You have to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Insertion disabled</td>
<td>Take no action</td>
</tr>
<tr>
<td>GREEN</td>
<td>A banknote can be inserted</td>
<td>Insert a banknote</td>
</tr>
<tr>
<td>GREEN</td>
<td>A banknote returned to the Inlet</td>
<td>Pull the banknote out</td>
</tr>
<tr>
<td>Off</td>
<td>Banknote are given out at the Outlet</td>
<td>Withdraw the banknotes</td>
</tr>
</tbody>
</table>
3. BASIC TROUBLESHOOTING

The basic troubleshooting is made by observing the several indicators of the BNR/BNA6’s modules. This troubleshooting is valid for the Firmware version 1.0.0.

<table>
<thead>
<tr>
<th>System / Module Status</th>
<th>You need to</th>
<th>Take no action</th>
<th>Take no action</th>
<th>Take no action</th>
<th>Configure the Module</th>
<th>Clear the Jam, refer to “EASY JAM CLEARING” or refer to the Service Manual</th>
<th>Require a “Reset” command</th>
<th>Empty the CB, refer to “CASH-BOX HANDLING”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locked</td>
<td>“Reset” required</td>
<td>After Switch-on, have the BNR to “Reset”</td>
<td>Fill the Loader Cassette with banknotes</td>
<td>Clear the Jam, refer to “EASY JAM CLEARING” or refer to the Service Manual</td>
<td>Configure the Module</td>
<td>Clear the Jam, refer to “EASY JAM CLEARING” or refer to the Service Manual</td>
<td>Require a “Reset” command</td>
<td>Empty the CB, refer to “CASH-BOX HANDLING”</td>
</tr>
<tr>
<td>Operational</td>
<td>Take no action</td>
<td>Operational</td>
<td>Operational</td>
<td>Operational</td>
<td>Operational</td>
<td>Clear the Jam, refer to “EASY JAM CLEARING” or refer to the Service Manual</td>
<td>Require a “Reset” command</td>
<td>Empty the CB, refer to “CASH-BOX HANDLING”</td>
</tr>
<tr>
<td>Bill Storage not OK</td>
<td>(Loader only)</td>
<td>Bill Storage not OK (Loader only)</td>
<td>Bill Storage not OK (Loader only)</td>
<td>Bill Storage not OK (Loader only)</td>
<td>Bill Storage not OK (Loader only)</td>
<td>Bill Storage not OK (Loader only)</td>
<td>Bill Storage not OK (Loader only)</td>
<td>Bill Storage not OK (Loader only)</td>
</tr>
<tr>
<td>Cash type Status not OK</td>
<td>(Re, Lo)</td>
<td>Cash type Status not OK (Re, Lo)</td>
<td>Cash type Status not OK (Re, Lo)</td>
<td>Cash type Status not OK (Re, Lo)</td>
<td>Cash type Status not OK (Re, Lo)</td>
<td>Cash type Status not OK (Re, Lo)</td>
<td>Cash type Status not OK (Re, Lo)</td>
<td>Cash type Status not OK (Re, Lo)</td>
</tr>
<tr>
<td>Remove Bill in Transport (jam, stopped, bill error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
<td>Not Operational (wrong module, OOS, transport error)</td>
</tr>
<tr>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
<td>Cash-Box full or not rearmed</td>
</tr>
</tbody>
</table>

**External Indicator – FW version 1.0.0**

- **Lock Indicator:**
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off

- **Green Indicator:**
  - x1
  - x1
  - x1
  - x1
  - x1
  - x1
  - x1
  - x1

- **Red Indicator:**
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off

- **Grey Indicator:**
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off
  - Off
4. EASY JAM CLEARING

It may happen that a banknote is jammed in the BNR/BNA6. The following cases of jammed banknotes are easy to clear.

For more difficult cases of jammed banknotes, refer to “ADVANCED JAM CLEARING” in the BNR&BNA6 Service Manual 67902-5-044.

4.1. 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/BNA6.

3. Close the Spine door
4.2. 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.
4.3. 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.
4.4. IN THE POSITIONER, AT THE INLET

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

2. Carefully withdraw the banknote.

3. Close the Positioner door, close the Recognition Sensor door and finally close the Spine door.
4.5. 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, USING AND QUALITY OF BANKNOTES” in the “NORMAL OPERATIONS IN HOST MACHINE” chapter.

5. Carefully withdraw the banknote.

6. Close and install the Loader Cassette, refer to “LOADER CASSETTE HANDLING, USING AND QUALITY OF BANKNOTES” in the “NORMAL OPERATIONS IN HOST MACHINE” chapter.
4.6. AT THE CASH-BOX PUSHER PLATE

1. Remove Cash-Box per instructions in section 2.2 above.
2. Inspect the BNR/BNA6 pusher plate located inside the BNR/BNA6 at the top of the opening where the Cash-Box was removed from.
3. If you see a banknote, carefully remove it.
4. The Cash-Box must be opened, emptied and rearmed before it can be re-installed in the BNR/BNA6.
5. Replace the rearmed Cash-Box.
5. RECOMMENDED PREVENTATIVE MAINTENANCE

5.1. BNR/BNA6 RECOMMENDED MAINTENANCE PLAN

The following table highlights the recommended maintenance frequency. The cleaning frequency was chosen to ensure optimal performance. It may be necessary to perform more or less frequent cleaning, depending on the operating environment and usage. If operating under particularly harsh conditions, extra attention should be given to the cleaning of the recognition sensors.

Definition of levels:

The BNR/BNA6 maintenance requires 3 different technical levels according to the intervention to perform:

- Level 1: Basic cleaning in the field (compressed air).
- Level 2: Deep cleaning in workshop, minor part replacement.
- Level 3: Deep cleaning in workshop, heavy part replacement.
Note that the following spare parts will become obsolete with the MMV19 implementation:

- 668142001P1 S BNR, BT-M1-GMA, PK1
- 666726001P1 S BNR,BU,SHAFT ASSY,N7, PK1
- 969983001P1 S BNR,MM,BU MAINTENANCE KIT
MAIN MODULE V19 AND LATER VERSIONS

<table>
<thead>
<tr>
<th>Main module (V19 and later versions)</th>
<th>MAIN MODULE V19 AND LATER VERSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BNR</strong> - Recommended maintenance plan</td>
<td><strong>BNR</strong> - Recommended maintenance plan</td>
</tr>
<tr>
<td>Sensor cleaning with air</td>
<td>Sensor cleaning with air</td>
</tr>
<tr>
<td>Every 100 cycles or every 12 months</td>
<td>Every 100 cycles or every 12 months</td>
</tr>
<tr>
<td>Change the receiving air of the filter</td>
<td>Change the receiving air of the filter</td>
</tr>
<tr>
<td>Every 12 months or every 2 years</td>
<td>Every 12 months or every 2 years</td>
</tr>
<tr>
<td>Replace all filters</td>
<td>Replace all filters</td>
</tr>
<tr>
<td>Check the filter</td>
<td>Check the filter</td>
</tr>
<tr>
<td>Every 100 cycles or every 12 months</td>
<td>Every 100 cycles or every 12 months</td>
</tr>
<tr>
<td>Replace all filters</td>
<td>Replace all filters</td>
</tr>
<tr>
<td>Sub-module: Banding (BU) from MEV19, equipped with BU closed loop</td>
<td>Sub-module: Banding (BU) from MEV19, equipped with BU closed loop</td>
</tr>
<tr>
<td>Check the filter</td>
<td>Check the filter</td>
</tr>
<tr>
<td>Every 100 cycles or every 12 months</td>
<td>Every 100 cycles or every 12 months</td>
</tr>
<tr>
<td>Replace all filters</td>
<td>Replace all filters</td>
</tr>
<tr>
<td>Sub-module: Banding (BU) from MEV19, equipped with BU closed loop</td>
<td>Sub-module: Banding (BU) from MEV19, equipped with BU closed loop</td>
</tr>
<tr>
<td>Check the filter</td>
<td>Check the filter</td>
</tr>
<tr>
<td>Every 100 cycles or every 12 months</td>
<td>Every 100 cycles or every 12 months</td>
</tr>
<tr>
<td>Replace all filters</td>
<td>Replace all filters</td>
</tr>
<tr>
<td>Sub-module: Banding (BU) from MEV19, equipped with BU closed loop</td>
<td>Sub-module: Banding (BU) from MEV19, equipped with BU closed loop</td>
</tr>
<tr>
<td>Check the filter</td>
<td>Check the filter</td>
</tr>
<tr>
<td>Every 100 cycles or every 12 months</td>
<td>Every 100 cycles or every 12 months</td>
</tr>
<tr>
<td>Replace all filters</td>
<td>Replace all filters</td>
</tr>
</tbody>
</table>
CASHBOXES AND LOADER (ALL VERSIONS)
RECYCLER (ALL VERSIONS)
# BNR - Recommended maintenance plan

## Spine (all versions)

<table>
<thead>
<tr>
<th>Up to: Spine cycles</th>
<th>100'000</th>
<th>250'000</th>
<th>500'000</th>
<th>750'000</th>
<th>1'000'000</th>
<th>2'000'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whichever comes first</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to: Time (Indoor)</td>
<td>6 months</td>
<td>12 months</td>
<td>24 months</td>
<td>36 months</td>
<td>48 months</td>
<td>96 months</td>
</tr>
<tr>
<td>Up to: Time (Outdoor)</td>
<td>3 months</td>
<td>6 months</td>
<td>12 months</td>
<td>18 months</td>
<td>24 months</td>
<td>48 months</td>
</tr>
</tbody>
</table>

*Indoor: Air conditioned / controlled environment

### Spine (SP)

- **Sensor cleaning with air**: ✓
  - Every 250'000 Spine cycle count, or every 0/12 months according to environment
  - Ivl 1 - In the field

- **Check sensor values**
  - If ≤ 100 then, clean lightguides with cloth and ECS 260
  - ✓ ✓ ✓ ✓ ✓ ✓
  - Ivl 2 - Workshop - ASCs

- **Cleaning belts and moving components (rollers and tires)**
  - ✓ ✓ ✓ ✓ ✓ ✓
  - Ivl 2 - Workshop - ASCs

- **Check Belts aspect/wear**
  - Change if required
  - ✓ ✓
  - Ivl 3 - Workshop - ASCs

**Spare parts:**

- 657774001P10, S BNR, SP-belt MXL driving 532 t, PK10
- 664902001P20, S BNR, SP-belt-MXL door BNR3, PK20
- 664931001P19, S BNR, SP-belt-MXL driving BNR3, PK10
- 657787001P10, S BNR, SP-belt-MXL-door 490, PK10

---

Information subject to change without prior notice.
CHASSIS (ALL VERSIONS)
5.2. BNR Bill path cleaning instructions

Out of service scenario due to dust in and around gears, belts, motors or optic guides.

It is recommended to clean the BNR/BNA6 according to Maintenance Table.

Duration
Approx. 10 min.

The dust could be due to banknote fibers which accumulate around critical parts. The recommended cleaning technique for the Main Module is to remove the dust with a spray of compressed air.

NOTE: In some images, the power and USB cables are not depicted to enhance overall clarity.

1. For this operation utilize a spray of filtered and compressed air with a max pressure of 50 PSI (=3.5 bars).

2. Remove the Cash-Box.
3. Open the Recognition Sensor door.

4. Open the Positioner door.
5. Clean the Inlet.

6. Clean the Bill Intake and the Positioner in the direction of the Recognition Sensor.
7. Blow the inner part of the Recognition Sensor, in the same direction, in the opposite direction of the white flat cables.
8. For the rear part of the Recognition Sensor, turn the coding wheel whilst blowing air throughout.

**Caution,** Ensure the compressed air cleaner produces no residue or liquid. Carefully clean the recognition sensor lenses to remove dust taking care to not scratch or damage the lenses.


11. Clean the rotating diverters inside the recognition sensor door, to clean sensor on the bottom transport.

12. Clean under Main Module.
13. Close the Recognition Sensor door and clean the Spine:

13.1. Blow the inner part of the Spine.

13.2. Blow the rear part of the Spine.
5.3. BNR Loader cleaning instructions

Frequency

It is recommended to clean the Loader according to Maintenance Table.

Duration
Approx. 3 min.

Equipment needed
Key to open the lock

- Gloves (cotton or equivalent)
  - Wear them during the whole procedure

- Bottle of “ElixClean 260”.
  See www.ecsag.com for order.
  - Follow the supplier’s safety instructions

- Compressed air spray

- Microfiber cloth
1. After retrieving the Loader from the frame (following the instructions in the Service Manual, Chapter 12), open it with the key

2. Empty the loader of any banknotes

3. Use the air spray all over the loader to blow the dust out of it.
4. Push the banknote plate to the bottom of the loader (up to the stop) and blow with compressed air.

5. Blow compressed air between the top and bottom roller drums, from the inside to the outside.

6. Lay the Loader down on the table, to clean the 3 roller drums.
7. Put **ElixClean 260** on the microfiber cloth.

8. Clean the top roller drum banknote’s side with the microfiber cloth, making cross movements to improve the cleaning.

   You can use the wheel to rotate the drum.

9. Clean the top roller drum and the bottom roller drum, making cross movements, with the microfiber cloth.

   You can make them rotate manually.

   Note: Shake and pull strongly the top roller to make it turn.
10. If needed, put banknotes into the Loader, close and lock it.
You can then put it back into the frame according to the Service Manual's instructions.
ERROR REPORT

Name of company: ________________________________

Date of intervention: ________________ Time: __________________

Name of person on duty: ________________________________

BNR/BNA6
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 eared □ Error not cleared □ Unit exchanged □
Appendices:

Bezel

Black Bezel  Grey Bezel  Flush Bezel

Cash-Box

Cash Box-S  (600 banknotes)  Cash-Box-M  (1400 banknotes)  Cash Box-L  (2200 banknotes)
BNR versions

BNR4-21  BNR4-11  BNR4-20  BNR4-10

BNR3-11  BNR3-20  BNR3-10  BNR3-00
BNA6 versions

BNA6-M

BNA6-L