INTRODUCTION

The scope of this document is to provide complete technical information about the **B2B 60** Bank Note Recycler.

- Development of new equipment with the **B2B 60** Bank Note Recycler.
- Selection of the right configuration and part number.
- Installation.
- Maintenance and service.
- Repair.

PRODUCT OVERVIEW

The CashCode B2B 60 Bank Note Recycler is typically installed on the front door (or the front panel) of a machine. Access to the recycling cassette and the vault is from the rear side of the Bank Note Recycler.

A complete B2B 60 Bank Note Recycler unit consists of three parts – the banknote validator itself, the removable recycling cassette and the removable vault.

The B2B 60 Bank Note Recycler has a multi-width banknote path for currencies 62…77 mm wide.

The B2B 60 Bank Note Recycler has very high acceptance rate, due to a set of advanced sensors and smart software that can precisely identify authentic banknotes from all known counterfeits.

Six multi-color optical sensors scan both sides of the banknote.

Two patented inductive sensors read the magnetic properties of the banknote.

All sensors have auto-calibration, no adjustments required. The validator always provides the same high acceptance level during its lifetime.

The B2B 60 Bank Note Recycler accepts banknotes in four ways and is equipped with a cross channel sensor to prevent stringing.

The B2B 60 Bank Note Recycler is very reliable and efficient, including the following features:

Beltless design minimizes maintenance of banknote transport mechanism.

The “Clamshell” design for the banknote recognition section provides a fast and easy access to the banknote path.

Software updates are fast and easy by means of memory stick. The update only take seconds. The procedure does not require technical personnel, tools, or disconnecting the unit. The socket for the memory stick is accessible from the back. No disassembly is required.
The **B2B 60** Bank Note Recycler can be mounted **Up-stacker** (common for vending equipment) or **Down-stacker** (used in amusement machines).

The **B2B 60** Bank Note Recycler uses standard **MDB** protocol.

An option is available for choosing either a standard plastic bezel with running lights, a coin-proof plastic bezel with running lights or vandal-proof metal bezel with a single bicolor LED.

The **vaults** are available in 400 and 600 banknote capacity sizes.

The **Recycling Cassette** has 70 banknotes capacity, which is also programmable in case the full capacity is not necessary. In addition, information concerning the type of denomination being recycled and cassette contents is stored inside the module's internal memory.

A two digit display on the back of the module shows how many banknotes are inside the recycler cassette.
GENERAL SPECIFICATIONS

Validation Sensors:
- 4-color optical sensors (OSRAM) ......................................................... 6
- Dielectric sensors .............................................................. 1 differential (optional)
- Inductive sensors .............................................................. 2
- Canadian configuration .................................................... supported by custom hardware configuration.

Barcode sensor ........................................................................................................... NONE
UV sensor .............................................................................................................. 1 (optional)
Anti-stringing sensor (optical) ..................................................................................... 1

Vending hardware configuration
- Interface connector ............................................................................ 14-pin connector used with custom ribbon cable harness

Supported Protocols and Interfaces .................................. MDB – BV with Recycler, MDB-BV with Coin changer commands retransmit, MDB with Custom interface channel for NRI changer connection, reading of statistical data and programming

Power ...................................................................................................................... 22 – 40VDC

Vault standard configuration .............................................................. 400 note (600 optional)

AWP hardware configuration
- Interface connector ............................................................................ 14-pin connector
- Supported Protocols and Interfaces ................................................. CCNET – Bill-to-Bill, ccTalk – BV and Payout

Power ...................................................................................................................... 22 - 40VDC

Vault standard configuration .............................................................. 400 note (600 optional)

Supported vaults .............................................................................................................. High impact resistant plastic vault
(survives free falling from 1 m on hard floor)

Maximum stacking capacity (new banknotes) ................................................................... 400, 600

Bezels
- Standard plastic bezel with standard green (line) running lights
- Standard plastic bezel with coin-proof BLUE (arrow) running lights (Up and Down )
- Vandal-proof and coin-proof single-LED metal bezel (required separate grounding wire)

Service indication ........................................................................................................ Blinks of the bezel lights

Recycling cassette features:
- Capacity
- Vending hardware configuration ................................................................. 30 banknotes max

AWP hardware configuration .............................................................................. 70 banknote max
- Status/load indication ................................................................................... 2-digit LED display
- Manual controls ............................................................................................... 2 mode buttons (feed and unload), recycling cassette assignment setup switch (2 positions)
Memory programming

BlueChip™ smart-stick memory
Via interface connector (In AWP implementation)*
Via custom NRI interface channel (Vending implementation)*

* - does not required NDE/NDEG memory stick presence.

Supported memory stick types

CCFS

Mode selection

(4 and 8-position DIP switches)

Acceptance:

Banknotes: lengthwise 4 ways
Custom coupons: lengthwise 4 ways
Barcoded coupons: not accepted

Validating rate: 96% or higher on first insertion

Accepted Banknote Width, in mm: 62 - 77
Maximum length of banknote, in mm: 160
Minimum length of banknote, in mm: 120

Banknote escrow: one banknote

Optionally, recycling cassette can be used as Escrow cassette if protocol allows. This option increase Escrow capacity up to Recycling cassette capacity.

Banknote processing cycle:

Centering and validating of banknote (before escrow position): <1.5 sec
Transport of banknote from escrow to cassette and stacking: <1.0 sec
Reject of banknote (from escrow): <1.2 sec
Target change cycle: 1st banknote – 2 seconds, next – plus 0.7 second per banknote.

Power current consumption (24VDC):

Idle mode: 0.3A
Operation mode: 0.8A
Operation mode (max): 3.0A

Environmental:

Operating temperature
Vending hardware configuration: -18 °C to +60 °C
AWP hardware configuration: 0 °C to +50 °C

Storage temperature: -30°C to +60°C
Humidity (non-condensing): 30%-90%RH

Lifetime expectation: more than 1000000 processed banknotes or 5 years

Approvals
FCC class B
UL 756
CE
ROHS compliant

Installation

On a vertical front wall of machine from inside. Two ways: vault Up or Down
Cabinet front panel's thickness: 1.5 to 12.7 mm (depends on bezel type)
Access to cassette: from back side of the recycler
Dimensions (WxHxD).................................................................109x456x185 (with 70 banknote Recycling cassette)

Weight, kg.................................................................3.7
CHOOSING B2B 60 BANK NOTE RECYCLER FEATURES AND PART NUMBERS

Banknote Validator

The information below helps to choose the appropriate B2B 60: Bank Note Recycler
- Bezel style
- Indoor or outdoor application (coated boards are used for outdoor application)

Bezel style

The standard plastic bezel can be used for the STACKER UP configurations. The bezel has a status indicator with running lights that glow BLUE when ready and RED when disabled. The running lights are also used for diagnostics (described in the troubleshooting section).

Two different styles of bezel are currently available.

The bezel first style is a standard plastic bezel.

The bezel second style has protection from inadvertent insertion of coins.
The bezel third style is metal bezel which has protection from inadvertent insertion of coins and vandal actions.

Indoor or outdoor application

The B2B 60 Bank Note Recycler can be ordered with boards coated for outdoor applications.

Vault cassette

The B2B 60 vault is available in two different capacities: 400 or 600 banknotes.

Memory stick and software update options

Software updates are released to accommodate new currency releases, new features and enhancements or to improve security.

Software updates are offered in two options:

1) Multi-download Memory stick

   The multi-download Memory stick allows for unlimited downloads.

2) Download via interface connector.

   The download is done thru the NRI coin changer by means of a Palmtop.

   Downloads may be done by connecting the recycler to a personal computer through a special adapter. Instructions on the software update procedure can be found in the chapter: “SOFTWARE UPDATES”.

   There are two separate part numbers for the B2B 60 Bank Note Recycler - software part number and hardware part number.

Example hardware part number:
Example software part number:

**MMB** – **EU10-12403**

- **MMB**
- **EU10-12403** - Software part number
- B2B 60 series

**MMB** – **3117**

- **MMB**
- **3117** - Hardware part number
- B2B 60
Bank Note Recycler installation

The B2B 60 Bank Note Recycler is usually installed on a door or panel. The panel or door must have a rectangular cut-out, with three threaded studs (vending machines have four studs for the validator, the top right isn't used with B2B 60 Bank Note Recycler and two additional studs at the top (per picture below, normally not necessary).
Chassis grounding.

Protective earth ground terminal must be connected to the machine electric earth. This connection must be made by cable OPT-MKSM-GND or another cooper wire cable with 14 or 12 AWG gauge. Use the shortest, practical wire length. Refer to local wiring codes and regulations for grounding requirements.
INTERFACE CONNECTION

The validator is powered by 24 Volt DC and is suited for MDB Interface (vending applications).

For detailed interface descriptions, please refer to Protocol Description Manuals available from the CashCode website: www.cashcode.com

Pin Assignment (cable connector):

<table>
<thead>
<tr>
<th>TERMINAL</th>
<th>SIGNAL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24V DC</td>
<td>POWER</td>
</tr>
<tr>
<td>2</td>
<td>DC POWER RET</td>
<td>POWER</td>
</tr>
<tr>
<td>3</td>
<td>MMB-MRX</td>
<td>MASTER RECEIVE INPUT (MMB)</td>
</tr>
<tr>
<td>4</td>
<td>MRX</td>
<td>MASTER RECEIVE INPUT</td>
</tr>
<tr>
<td>5</td>
<td>MTX</td>
<td>MASTER TRANSMIT OUTPUT</td>
</tr>
<tr>
<td>6</td>
<td>COMMON</td>
<td>COMMUNICATION’S COMMON</td>
</tr>
<tr>
<td>7</td>
<td>CMTX</td>
<td>MASTER TRANSMIT OUTPUT (Changer)</td>
</tr>
<tr>
<td>8</td>
<td>CMRX</td>
<td>MASTER RECEIVE INPUT (Changer)</td>
</tr>
<tr>
<td>9</td>
<td>TTX</td>
<td>TRANSMitted DATA (TTL)</td>
</tr>
<tr>
<td>10</td>
<td>TRX</td>
<td>RECEIVER DATA (TTL)</td>
</tr>
<tr>
<td>11</td>
<td>TXD-RS</td>
<td>TRANSMitted DATA (RS232)</td>
</tr>
<tr>
<td>12</td>
<td>RXD-RS</td>
<td>RECEIVER DATA (RS232)</td>
</tr>
<tr>
<td>13</td>
<td>GROUND</td>
<td>GROUND</td>
</tr>
<tr>
<td>14</td>
<td>+5V</td>
<td>POWER</td>
</tr>
</tbody>
</table>

Molex, Part #: 90142; 90119, 14 pcs
INPUT/OUTPUT CIRCUITS
CPU board (0401035)
SWITCH SETTINGS

Bank Note Recycler

The DIP switches are on the CPU board and are accessible without removal of the vault.

The Bank Note Recycler operates in two basic modes: Validation and Service.

**Validation Mode:** The normal operation mode.

**Service Mode:** Used for testing purposes.

Selection between these two modes as well as denominations enable/disable, high acceptance/high security and coupon acceptance, is configured via these DIP switches

DIP switches function:

A set of 8 DIP switches (SW1) defines the settings and programs the Banknote Validator to recognize and validate different denominations.

```
1: Off= $1 Enabled, On= $1 Disabled
2: Off= $2 Enabled, On= $2 Disabled
3: Off= $5 Enabled, On= $5 Disabled
4: Off= $10 Enabled, On= $10 Disabled
5: Off= $20 Enabled, On= $20 Disabled
6: Off= $50 Enabled, On= $50 Disabled
7: Off= Coupon Enabled, On= Coupon Disabled
8: Reserved
```

A set of 4 DIP switches (SW1) defines the settings of interface type.

```
1: Reserved
2: Off= High Acceptance, On= High Security mode
3: Reserved
4: Off= Normal operation, On= Service mode
```

For a complete explanation of switch description, please see the software User's Guide (enclosed to each Bank Note Recycler and available at [www.cashcode.com](http://www.cashcode.com)).
Recycling cassette

The two buttons and two DIP switches to operate and configure the recycling cassette are accessible from the back without the need for disassembly.

The DIP switches set the denomination to be recycled and place the unit in “float” setting mode.
Switch 1 Off= Recycle 10€, On= Recycler 20€
Switch 2 Off= Normal operation, On= Float setting, when in float setting mode, the feed and unload buttons act as up/down for float adjustment, when desired float is set, return switch 2 to Off.

Description of the switch functions also comes in the Software User’s Guide (supplied with the unit) or at www.cashcode.com.

Feed/Unload buttons

The feed/unload buttons are next to the DIP switches on the back of the recycling cassette.

The feed button is used to load the cassette with banknotes for the denomination being recycled. The B2B 60 Bank Note Recycler will go into feed mode by pressing and holding the feed button for 3 seconds.
The running lights will go from running to a steady blinking, indicating the unit is in feed mode. At this point, the operator starts inserting banknotes for the denomination to be recycled until the desired float of banknotes is reached.
The amount of banknotes will be shown on the two digit display on the back of the cassette.
To exit the loading mode, the feed button must be pressed again or if banknotes are not inserted within 20 seconds, the B2B 60 Bank Note Recycler will time out and exit the feed mode automatically.
The running lights will indicate normal operation again.

By pressing the unload button one banknote will be unloaded from the recycling cassette out to the bezel.
Manual dispensing by unload button is enabled only in service mode. In normal operation it depends on external interface.
If the feed and unload buttons are pressed and held simultaneously for a couple of seconds, the entire recycling cassette contents will be loaded into the drop cassette.
MAINTENANCE AND SERVICE

Vault Removal and Installation

Installing the Vault:

To install the vault into the Bank Note Recycler main chassis, insert the pins on the side of the vault into the slots in the chassis and push down until the latch on the top of the vault is engaged.

Removing the Vault:

To remove the vault, press on the latch to release, lift the cassette and remove it, outwards.
To collect banknotes from the vault, press on the door's latch as indicated below to open door, remove banknotes. Close door by pressing door latch until is engaged. There is no need to remove the vault from main chassis to collect the money.
Recycling Cassette Removal and Installation

Removing the Recycling Cassette:
- Push the latch on the side of the recycling cassette as shown below;
- Swing cassette open as indicated and complete removal by dislodging pins on the other side from their slots.

Installing the Recycling Cassette:
- Insert the two metal pins into their slots and swing the cassette close until the latch is engaged, as shown below.
Opening the Cassette:

Manual Unloading:

Release plastic handle. Lift the gray cover and to turn it counter clockwise.

Open the gate assembly (fork shaped part at banknotes entrance) and rotate the plastic handle counter-clockwise. The banknotes are manually dispensed one banknote at a time. Should a jammed banknote be present in the entrance slot, this banknote can be easily removed without affecting the later operation of the cassette. Please note: manual banknote unloading will reduce the number of the banknotes in the cassette without changing the number of banknotes in the flash memory. It is strongly recommended to perform a complete unloading after the cassette is replaced (please see the "Load/Unload buttons" section). This will allow the MB to readjust the flash memory when the cassette is back in operation.

Caution. Do not try to pull out the tape in the cassette! This can damage the cassette!

Scheduled Maintenance

During normal operation, dust and dirt accumulate on the optical sensors and the rollers. This could result in reduced acceptance rate. The banknote path is recommended to be cleaned, as explained below, every 6 months or after acceptance of 60,000 banknotes, whichever comes first.

Remove the cassette. Open the clamshell by pushing the button as shown below. Make certain that:

- there are no scratches on the guides and optical sensors
- there is no dirt or cracks on the surface of the transport rollers
- there is no dirt on the surface of the optical sensors
- the entire banknote path is clean of paper debris or residue
The dirt must be removed with soft moistened cloth. Isopropyl Alcohol is recommended for cleaning rollers with excessive dirt build up.

DO NOT USE ACETONE OR PETROLEUM BASED PRODUCTS AS THEY COULD CAUSE DAMAGE PLASTIC PARTS.

Inspect the cassette chamber to make certain that there are no banknote fragments or paper residue left. They may be removed with compressed air.

**Maintenance of the Recycling Cassette**

Maintenance is recommended approximately twice a year and includes:

- visual inspection of tapes
- visual inspection of optical sensors

A mechanism within the cassette keeps the tapes tight at all times, which provides appropriate support for stored banknotes. Should any tape start sagging, simply rotating the plastic handle on the cassette in any direction. This makes the cassette mechanism retighten the tape.

For reliable operation, there must be no dust or dirt on the surface of the optical sensors. There are five sensors that must be cleaned with a soft cloth and isopropyl alcohol, once the front cover is open.

**SOFTWARE UPDATES**

To ensure the B2B 60 Bank Note Recycler proper operation, software updates must be ordered in accordance with the original B2B 60 part number.

The B2B 60 Bank Note Recycler is shipped with a pre-installed software, according to the specifications ordered.
Installation of the memory stick

Accessing the memory stick slot is done from the back of the unit, no disassembly is required. Simply turn power off and insert the memory stick in the way shown below.

Download procedure:

Step 1. Turn Power OFF.
Step 2. Insert memory stick in its slot with contacts facing out.
Step 3. Turn power ON, running lights will blink in a special pattern, wait until the downloading is completed.

Once the download is completed, the running lights will go back to normal pattern. Should the lights stay red, this means there is no communication between the MB and the host controller. Further download attempts would have no effect.
SOFTWARE UPDATE DIAGNOSTICS

Normally, the download process will be accompanied by a blinking red-blue status light for about 5 seconds. If the download has competed successfully, the status light will turn blue. Should the download is unsuccessful; the status light will emit short blue flashes followed by a longer red flash (“blue flashes on red”).

The following table lists description of errors indicated by the flashes.

<table>
<thead>
<tr>
<th>STATUS OF DIAGNOSTIC LIGHT</th>
<th>ERROR DESCRIPTION</th>
<th>FAULT – HANDLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Blue Flash on Red</td>
<td>External interface</td>
<td>1. Verify that software is appropriate for downloading via interface. Repeat the procedure.</td>
</tr>
<tr>
<td>2 Blue flashes on red</td>
<td>Memory Stick CRC ERROR</td>
<td>1. Turn power off, remove and insert the Memory stick again, turn power on. Replace the Memory Stick with a new one.</td>
</tr>
<tr>
<td>3 Blue flashes on red</td>
<td>Incorrect data in the Memory Stick</td>
<td>1. Verify that the software is suitable to the Banknote Validator type. Insert correct type of CashCode Memory Stick.</td>
</tr>
<tr>
<td>4 Blue flashes on red</td>
<td>Memory stick is not inserted</td>
<td>Insert the Memory Stick properly.</td>
</tr>
<tr>
<td>5 Blue flashes on red</td>
<td>Wrong type of the Memory Stick</td>
<td>Insert the proper type of CashCode Memory Stick.</td>
</tr>
<tr>
<td>6 Blue flashes on red</td>
<td>Failure during download</td>
<td>1. Turn power off, remove and insert the Memory stick again, turn power on. Repeat the procedure.</td>
</tr>
<tr>
<td>7 Blue flashes on red</td>
<td>Operation ERROR of the Memory Stick Interface</td>
<td>1. Turn power off, remove and insert the Memory stick again, turn power on. Replace the Memory Stick with a new one.</td>
</tr>
</tbody>
</table>
TROUBLESHOOTING

The **B2B 60** Bank Note Recycler has self-diagnostic capabilities to assist in a repair or maintenance.

When the power is on, the Bank Note Recycler starts its self-diagnostic procedure. If the self-diagnostics test has passed, then the status light will turn blue. If an error is detected, then the status light on the front will blink red. The number of times the red light flashes is an indication of a specific problem or malfunction. A detailed list of these errors and corrective actions is provided below.

Every time the running lights are red, you can insert a banknote in the bezel, the unit will return a blinking pattern, just count the number of flashes and look on the table below for the problem associated.

### Operation Mode Diagnostics

<table>
<thead>
<tr>
<th>Number of status light flashes</th>
<th>Error description</th>
<th>Fault – handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vault removed</td>
<td>Check if vault is installed correctly</td>
</tr>
<tr>
<td>2</td>
<td>Wrong type of sensors</td>
<td>Check accordance type of the sensor to software</td>
</tr>
<tr>
<td>3</td>
<td>Vault full</td>
<td>Empty vault</td>
</tr>
<tr>
<td>4</td>
<td>Recycling cassette is out of position or there is a communication failure</td>
<td>Check if recycling cassette is installed correctly</td>
</tr>
<tr>
<td>5</td>
<td>Failure of the recycling cassette gate</td>
<td>Open the recycling cassette and clean the optical sensors for the gate position</td>
</tr>
<tr>
<td>6</td>
<td>Failure of the optical sensors</td>
<td>Open the guides and clean the optical sensors</td>
</tr>
<tr>
<td>7</td>
<td>Failure of the inductive sensors</td>
<td>Open the guides and clean the inductive sensors</td>
</tr>
<tr>
<td>8</td>
<td>Failure of the transport motor</td>
<td>Remove vault and recycler cassette and clean the banknote path</td>
</tr>
<tr>
<td>9</td>
<td>Failure of the recycling cassette tape</td>
<td>Open the recycling cassette, clean the optical sensors for the tape position</td>
</tr>
<tr>
<td>10</td>
<td>Communication failure between main chassis and recycling cassette</td>
<td>Check comb connector</td>
</tr>
<tr>
<td>11</td>
<td>The banknote pathway is not empty</td>
<td>Open the sensors compartment and check the condition of the banknote path</td>
</tr>
<tr>
<td>12</td>
<td>Banknote that should have been paid out was sent to the vault</td>
<td>Remove vault and recycler cassette and clean banknote path.</td>
</tr>
<tr>
<td>13</td>
<td>Banknote jam in the recycling cassette</td>
<td>Remove the recycling cassette and pull out jammed banknote</td>
</tr>
</tbody>
</table>
TECHNICAL SUPPORT

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