SUZO HAPP

Solutions Focused. Technology Driven.

Operation Manual

Bill to Bill™ XT

currency management system

1. The information contained here-in is the property of Suzo-Happ and is not to be disclosed or used without the written permission of Suzo-Happ. This copyright extends to all electronic, print or visual media.
2. Under no circumstances any 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 Suzo-Happ.
3. Suzo-Happ reserves the right to change the product specifications at any time. Also, Suzo-Happ disclaims any liability for any direct or indirect losses arising out of use or reliance on this information. This information is for guidance only.
4. For any feedback or errors, please contact us at bill-to-bill@suzohapp.com

Revision History

30 Nov, 2015	First release

1.Introduction

This manual is designed to help with the integration of the Bill-to-Bill™ XT currency management system.

Information provided in this manual includes

Dimensions and mounting instructions.

Specifications, configurations and accessories.

Settings and software updates.

Diagnostics.

1.1. Safety Instructions

Please observe the below guidelines

- Do not attempt to lift by bending forward. Use proper lifting technique as applicable for heavier objects.
- Do not lift or transport the device by chassis handle.
- Make sure power connector is attached firmly before applying power.
- Make sure power is switched off before attempting to remove any module.
- Follow handling instructions enclosed with the unit
- Follow specifications for operation, environmental and storage conditions.

1.2. Product Overview

The Bill-to-Bill™ XT is a currency management system designed to validate and recycle banknotes. About 300 banknotes may be stored and dispensed as change. The device has the following features:

Handles banknotes 62 to 82 mm wide, and 125 to 180 mm long. This covers most of the present day currencies.

Utilizes a mechanism to center and align banknotes of different widths.

Recycles up to 3 denominations to a total of 300 banknotes (in 3 recycling cassettes)

Dispenses multiple (max 20) banknotes in one operation

Supports easy firmware updates using Memory Card or through the host.

Offers a choice of bezels (standard, running lights, digital display and metal)

Secure lockable cash box (drop cassette) with 1000 bank note capacity.

1.3. Specifications

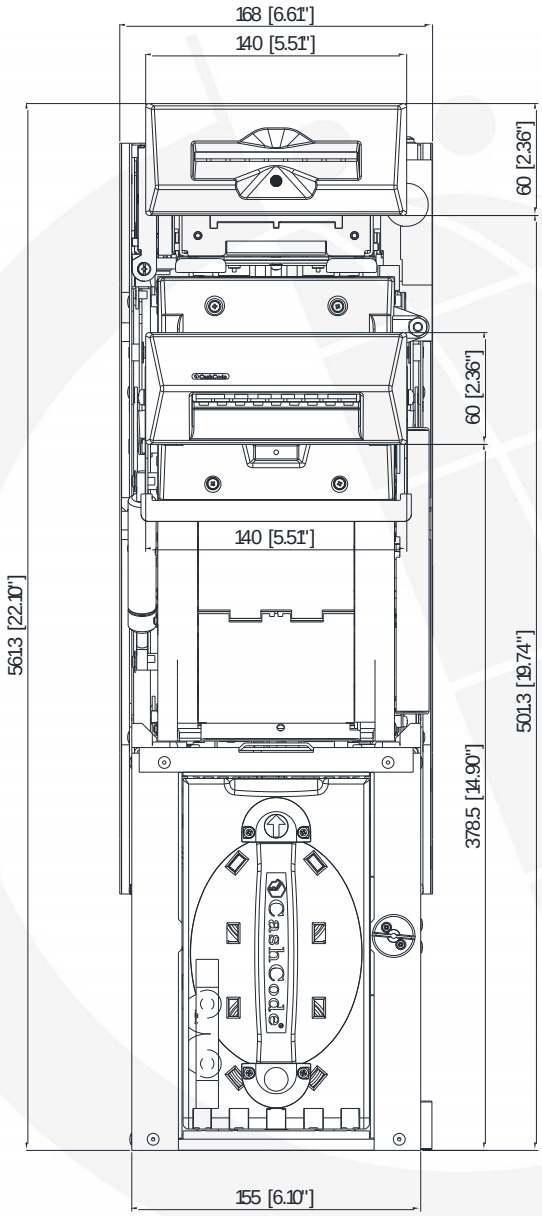
Banknotes	
Acceptance	Lengthwise 4 ways
Acceptance Rate	98% or higher (on first insertion)
Banknote Width (mm)	62 ~ 82
Banknote Length (mm)	125 ~ 180
Recycling capacity	Up to 300 (up to 3 denominations)
Dispensing capacity	Up to 20 banknotes at a time (15 if longer than 172 mm)
Barcode Coupons	
Acceptance	Lengthwise 2 ways (face up)
Width (mm)	62 ~ 82
Length (mm)	125 ~ 180
Encoding standard	ANSI/AIM BC2-1995, Uniform Symbology Specification – Interleaved 2 of 5
Narrow bar width (mm)	0.5 to 0.6
Wide/Narrow bar ratio	3:1
Number of characters	6 to 18
PCS (Print Contrast Signal) value	0.6 min
Interface	
Electrical	EIA 232C (RS 232)
Communication Protocol	CCNET
Power Requirements	
Operating voltage (V DC)	24
Standby Current (A)	0.6
Operating Current (A)	2.0
Peak Current (A)	4.0

Environmental Requirements	
Operating Environment	Indoor or Protected
Operating Temperature (C)	0 … + 50
Storage Temperature (C)	-30 … + 60
Humidity (RH, non-condensing)	30 … 90 %
Dimensions	
H x W x D (mm)	561 x 168 x 389
H x W x D (inches)	22.10 x 6.61 x 15.33
Weight	
Unit (Kg)	18.70
Unit (Lb)	41.30
Chassis with cassettes and dispenser (Kg)	9.60
Chassis with cassettes and dispenser (Lb)	21.20
Service Access	Front of unit

Cash Box

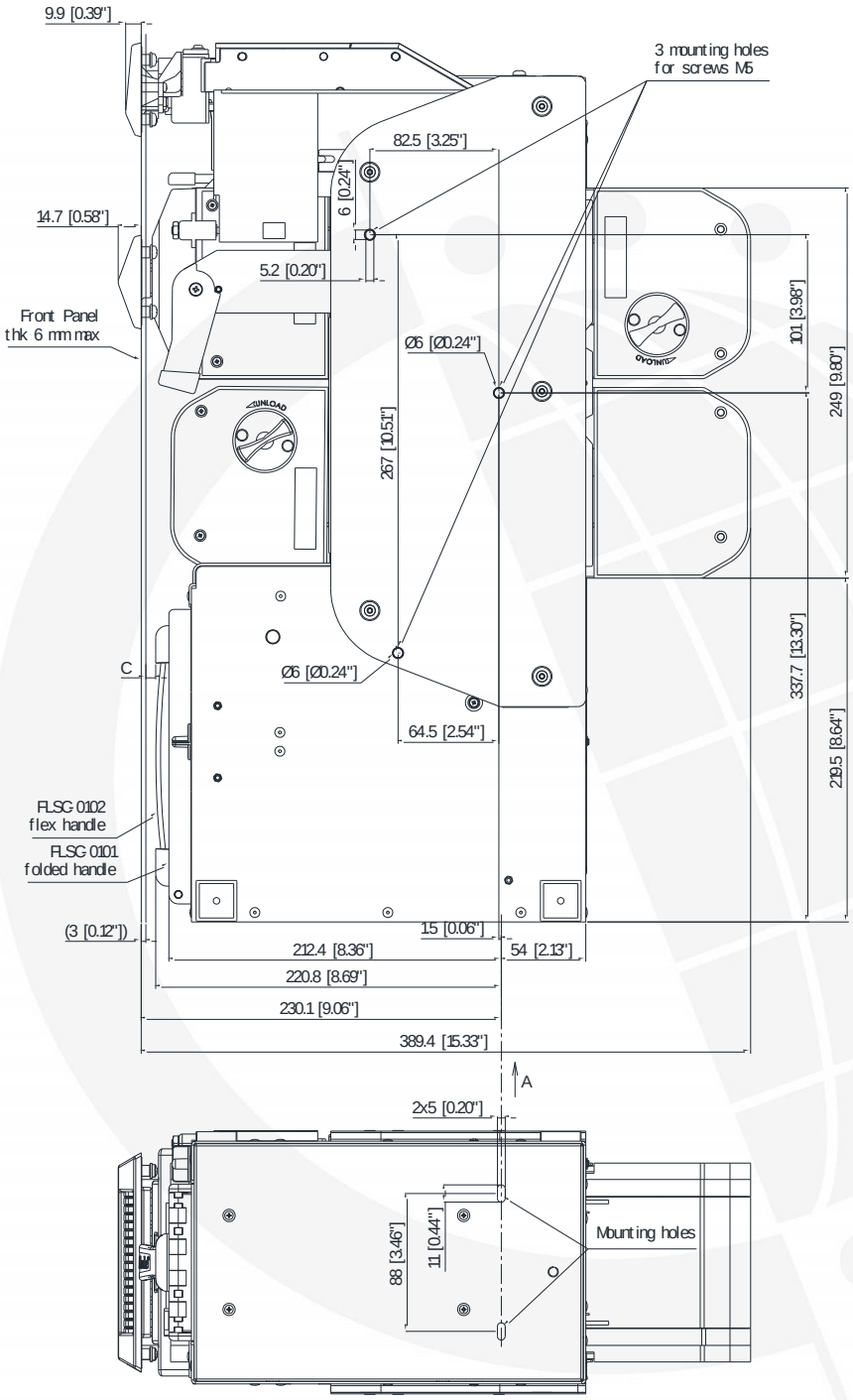
Bank Note Acceptance	
Length (mm)	62 – 85
Width (mm)	120 - 170
Dimensions	
H x W x D (mm)	188 x 104 x 233
H x W x D (inches)	7.42 x 4.09 x 9.18
Weight (Empty)	
Unit (Kg)	1.40
Unit (Lb)	3.08
Electronic Identification	RFID

1.4. Dimensions



Front View

Dimensions in mm [inches]



View A

Side and Bottom View
Dimensions in mm [inches]

2. System Description

2.1. Device Part Number

Bill-to-Bill™ XT configuration can be identified by the following part numbering scheme.

TBB-AAAABBCCCC[-DD]

AAAA – 4 digits – hardware configuration

BB – characters - represent currency, example US, USMX, EUGB

CCCC – 4 digits – represent software version

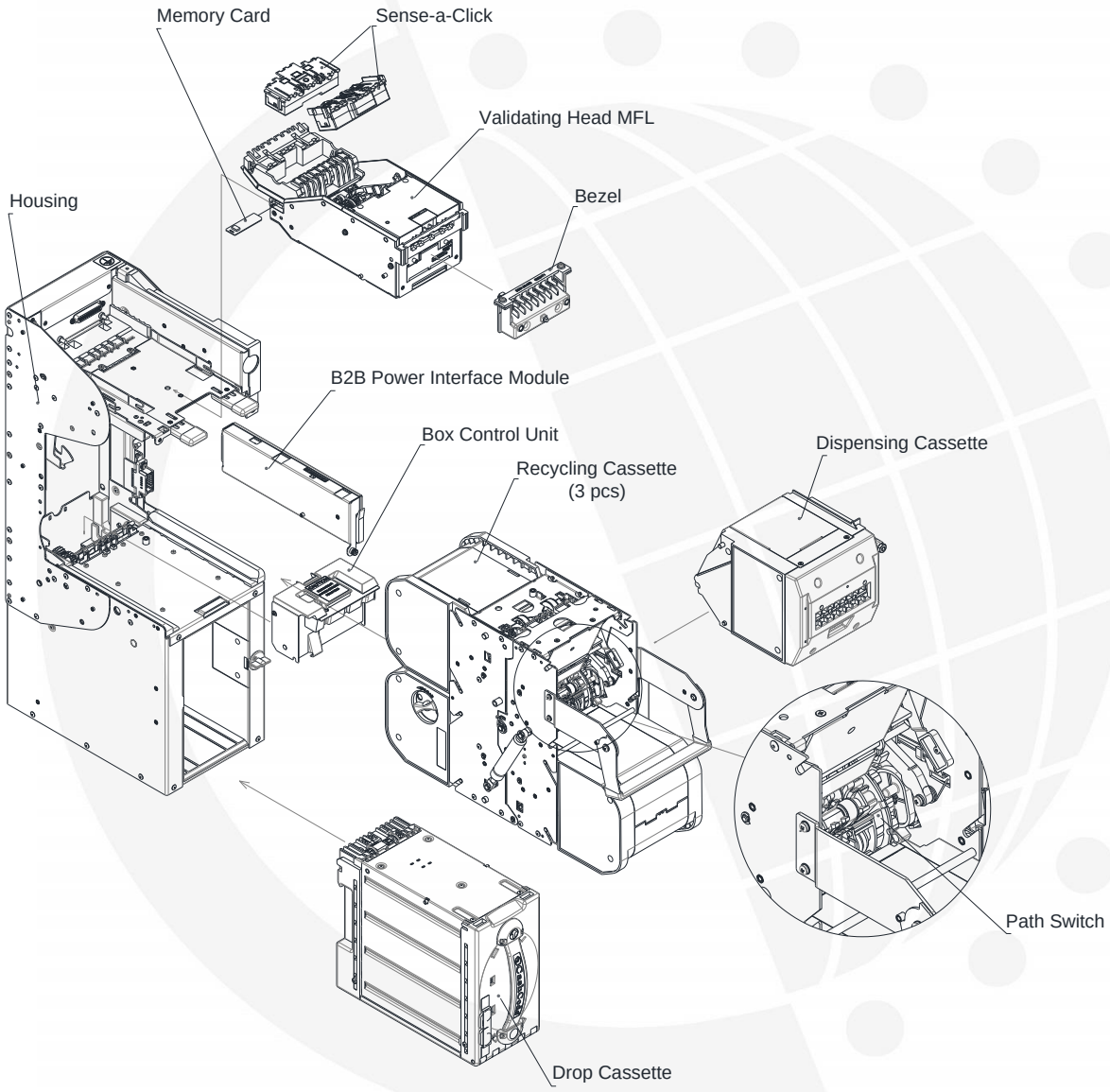
DD – 2 digits – represent customer ID for network firmware updates

Example: **TBB-5510US1100-10**

Please consult with your sales representative to identify part number specific to your requirements.

2.2. Description of Modules

Bill-to-Bill™ XT consists of following modules



Validating Head – Accepts, validates banknotes and controls rest of the device.

Bezel – Facilitates easy banknote insertion and provides diagnostic indication by flashing the indicator light.

Sense-A-Click™ - Replaceable sensor module containing validation sensors.

Power Interface Module – Handles communication with host controller and distribution of power to internal modules.

Memory Card – Provides easy upgrade of firmware.

Recycling Cassettes – Store and recycle about 100 bills

Dispensing Cassette – Dispense up to 20 bills

Path Switch – Routes banknotes.

Chassis – Holds and controls path switch, recycling & dispensing cassettes and facilitates banknote routing.

Box Control Unit – Drives stacking mechanism in cash box.

Cash Box - Stacks and holds validated bills.

Housing – Holds chassis, validating head, box controller & cash box and facilitates communication between them.

For part numbers to modules specific to your device please refer to product user guide.

2.3. Validating Head - MFLV-9013

The validating head is the key module featuring many subsystems.

Banknote alignment, validation and transport.

The validating head features a mechanism to align skewed banknotes and banknotes of varying width. The guides adjust the width of the path so banknotes are centered before entering the validation area. The validation system checks optical, magnetic and dielectric properties of the banknotes.

Operation

In addition to regular host communication mode it features a service mode for diagnostics and standalone operation.

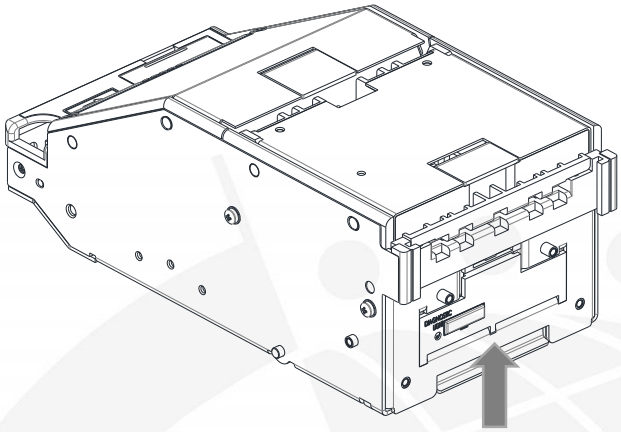
DIP Switches

Convenient to select operation modes or denominations to be accepted

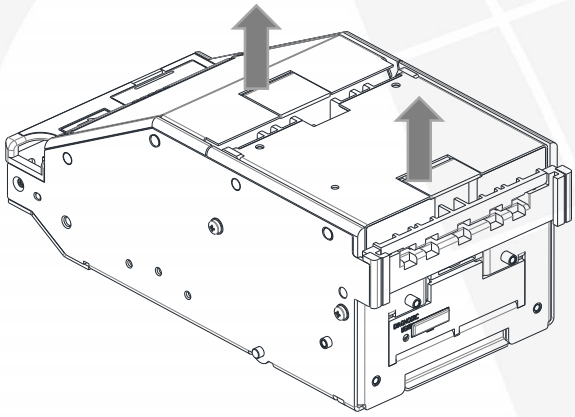
Memory Card

Provide easy and efficient way to perform software updates.

For troubleshooting and maintenance the validating head can be easily removed from the housing. This is done by lifting the latch as indicated below.



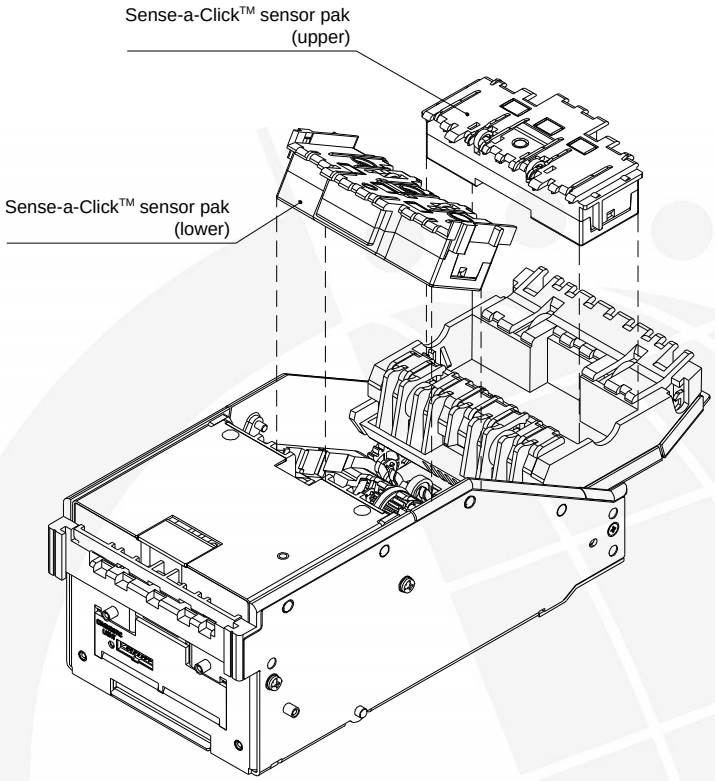
The banknote path may be accessed by opening the two guides. This is done by lifting the latches as shown below.



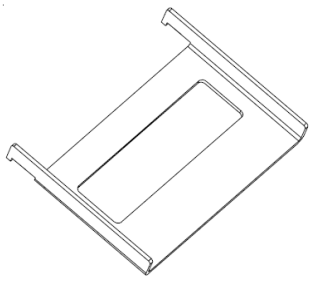
2.4. Sense-A-Click

Sense-A-Click modules contain optical, inductive and dielectric sensors for secure banknote validation. Coupons are validated by a barcode sensor. An anti-stringing sensor provides protection against cheating attempts.

4 types of Sense-A-Clicks are available: FLS-1706, FLS-1707, FLS-1802 and FLS-1902. Exact type is defined by the banknotes accepted.

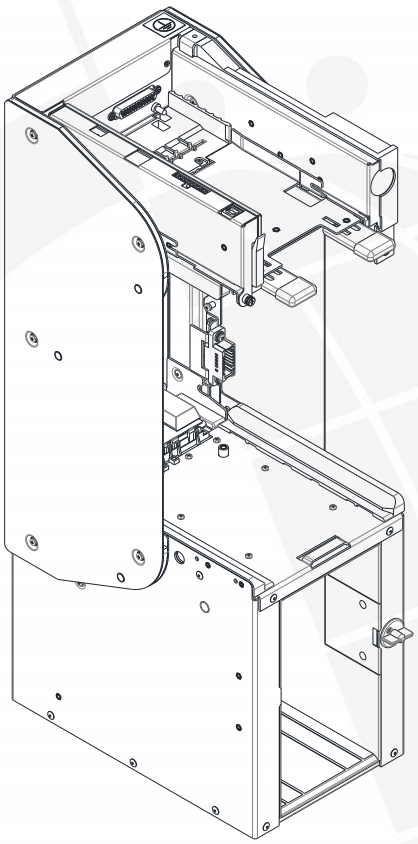


A special tool OPT-HW-FT01 is available for easy removal of Sense-A-Clicks.



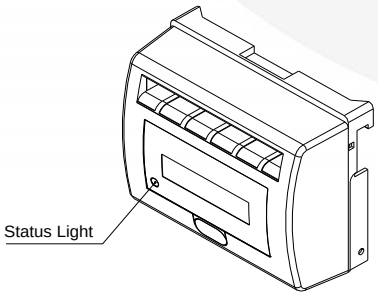
2.5. Housing - BBH-5521

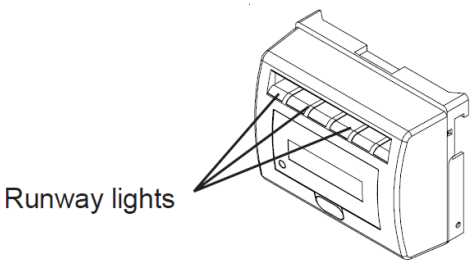
The Housing is made of a rigid metal structure, to facilitate easy mounting of the device.



2.6. Bezel

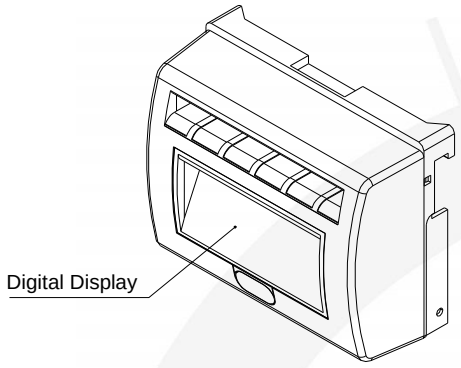
5 types of bezels are available as listed below.



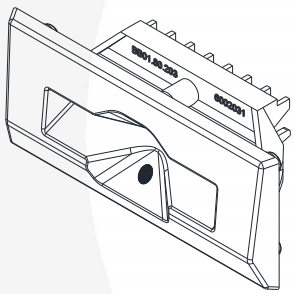


Standard Bezel
MFLB-2401

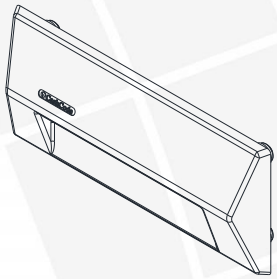
Running Lights Bezel
MFLB-4017



Digital Display Bezel
MFLB-4027



Metal Bezel
MFLB-6101



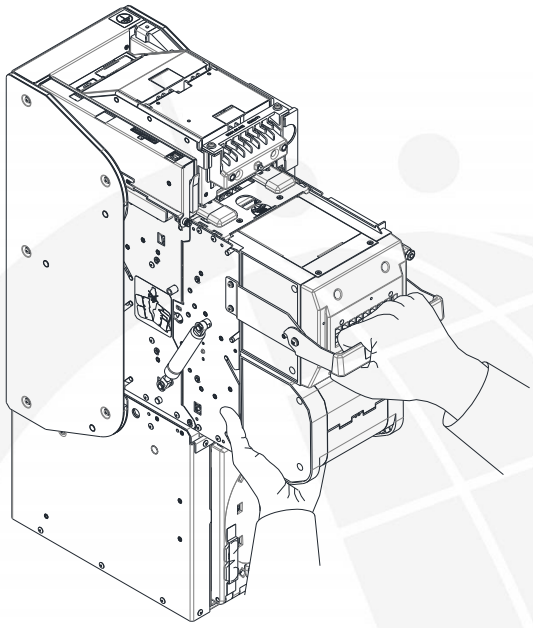
Metal (Dispenser) Bezel
MFLB-6301

Note: Metal bezels require additional grounding hardware.

2.7. Chassis - BBC-0310

The chassis can hold up to 3 recycling cassettes, dispensing cassette, and path switch. It also has motors for transporting banknotes to recycling cassettes and positioning the path switch.

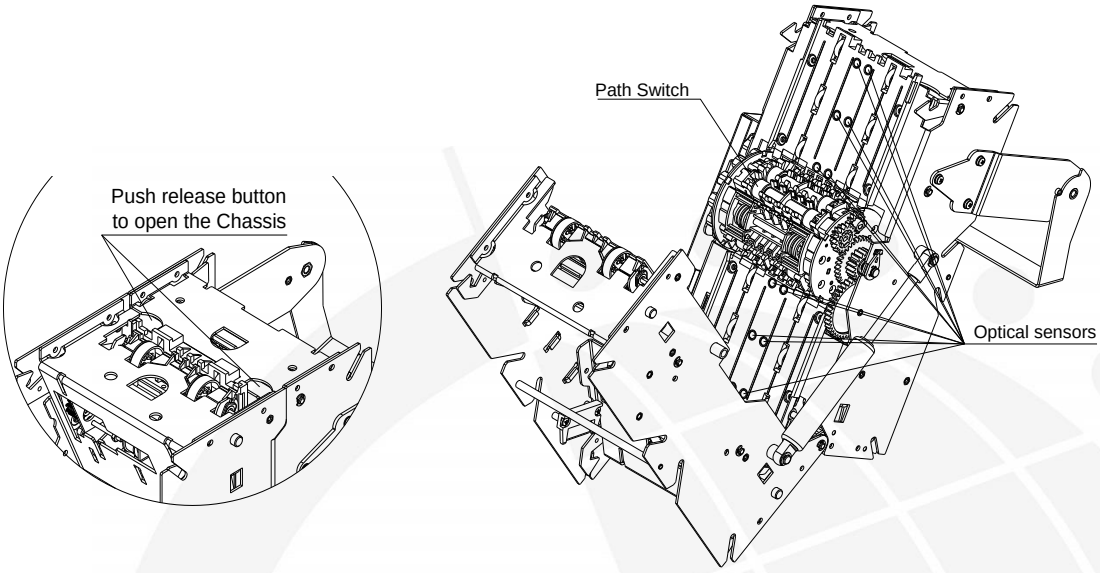
2.7.1. Removing Chassis



- Unlock the chassis if it is locked to the housing.
- Push the release bar under the validating head.
- Pull out the chassis with one hand while supporting with other hand.

2.7.2. Accessing Banknote Path

Press both release buttons and open the chassis. The gas spring supports the chassis in open position. The opened chassis allows access to the path switch as well. It is not necessary to remove recycling and dispensing cassettes to open the chassis.



2.7.3. Installing Chassis

- Make sure the lock is in unlocked position.
- Install the chassis with one hand while supporting with other hand. Make sure it is securely locked in position.

2.8. Recycling Cassettes

2.8.1. Recycling Cassette Options

The Bill-to-Bill™ XT takes up to three recycling cassettes. These may be programmed to same or different banknote denominations.

The storage capacity of these cassettes ranges from 80 to 110 banknotes depending on the banknote length. Shorter the banknote, higher is the capacity.

Recycling cassettes store information on the number and denomination of banknotes held in them. This provides flexibility allowing operators to place cassettes in any position in the chassis.

4 types of recycling cassettes are available as listed below.

Part Number	Type
BBR-0110	Non-Lockable
BBR-0111	Lockable

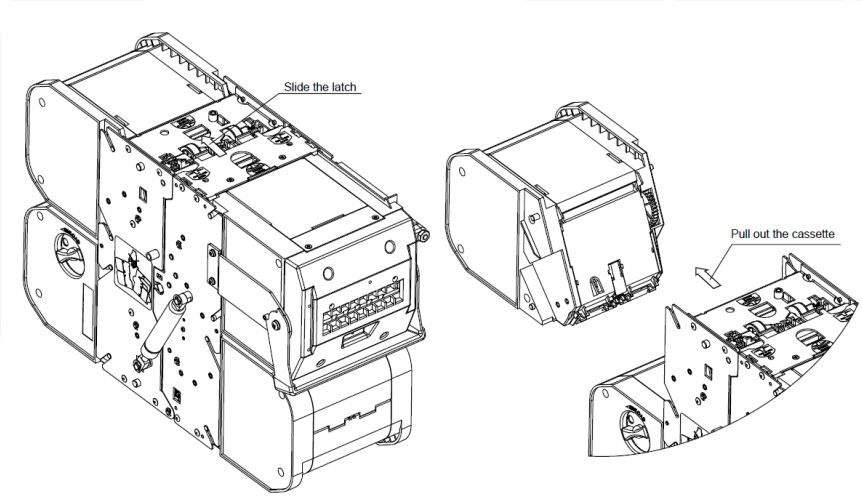
Part Number	Type
BBR-0112	Non-Lockable Narrow Tape
BBR-0113	Lockable Narrow Tape

BBR-0112 and BBR-0113 are used for bank notes wider than 76 mm.

BBR-0111 and BBR-0113 provide locks for added security.

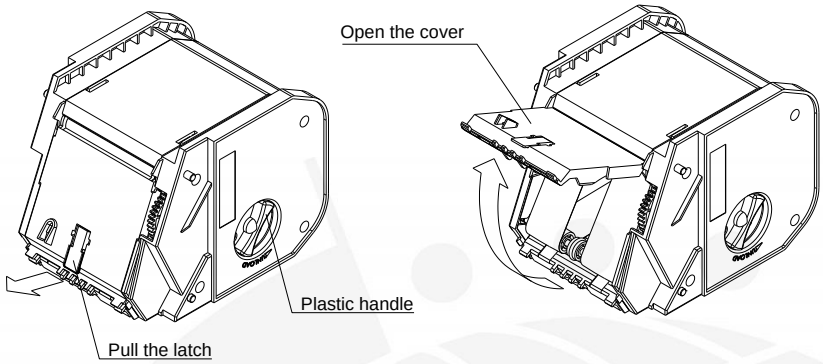
2.8.2. Removing Recycling Cassettes

Remove the chassis from the Bill-to-Bill housing.
Slide the latch on the chassis (each cassette has its own latch) and pull out the cassette.



2.8.3. Manual Unloading of Banknotes

It is recommended that the banknotes be unloaded using normal unload/dispense commands from the host machine. There may be instances when this is not possible and it may be required to unload banknotes manually. Manual unloading is only possible from non-lockable cassettes as explained below. Removal of banknotes from lockable cassettes can only be performed by trained personnel.



Rotate the plastic knob in counter-clockwise direction. Banknotes will be dispensed one at a time. A jammed banknote may easily be removed without adversely affecting operation of the cassette.

When banknotes are manually removed the count in the cassette memory will be different from the actual. It is therefore recommended to perform a complete unload operation after any manipulation. This must be performed immediately after the cassette is placed back in the chassis.

Care must be taken not to pull out the white polymer tapes. Doing so may adversely affect the performance of the cassette.

2.9. Dispensing Cassette – BBD-0610

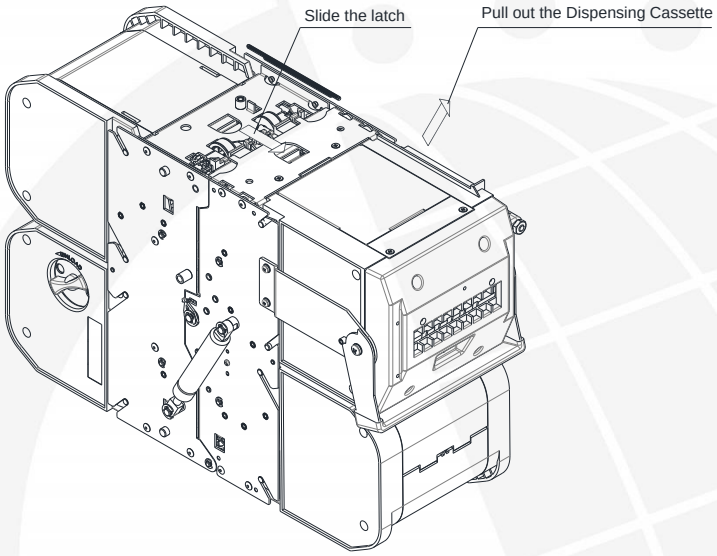
The dispensing cassette is located right under the validating head. It is capable of dispensing up to 20 banknotes. These banknotes could come from any one or all three recycling cassettes. Multiple dispense operations would be required if more than 20 banknotes are to be dispensed.

Part Number	Type
To be determined	Plastic Bezel
BBD-0610	Metal Bezel

2.9.1. Removing Dispensing Cassette

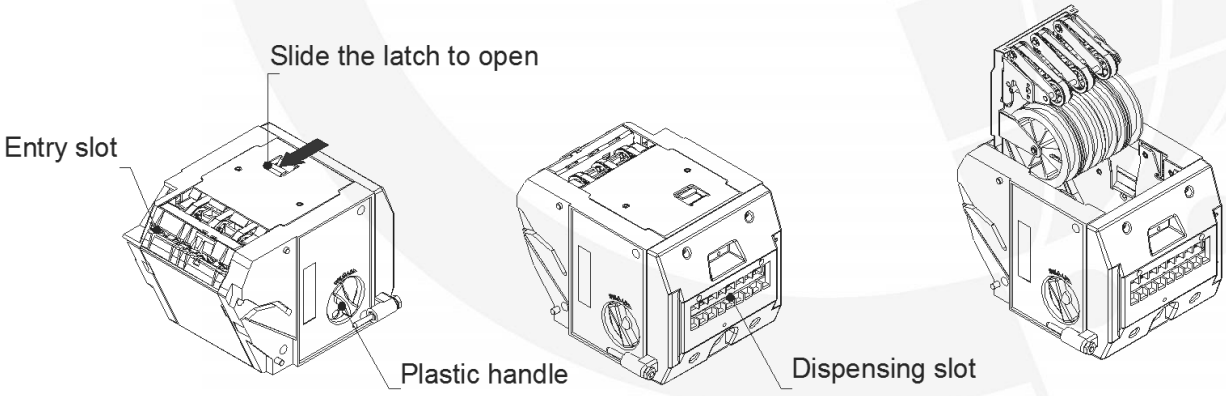
Remove the chassis from the housing.

Slide the latch on the chassis and pull out the dispensing cassette



2.9.2. Opening Dispensing Cassette

Slide the metal latch and open the top cover of the dispensing cassette.



2.10. Path Switch - BBS-0110

The path switch routes the banknotes to the appropriate destination.

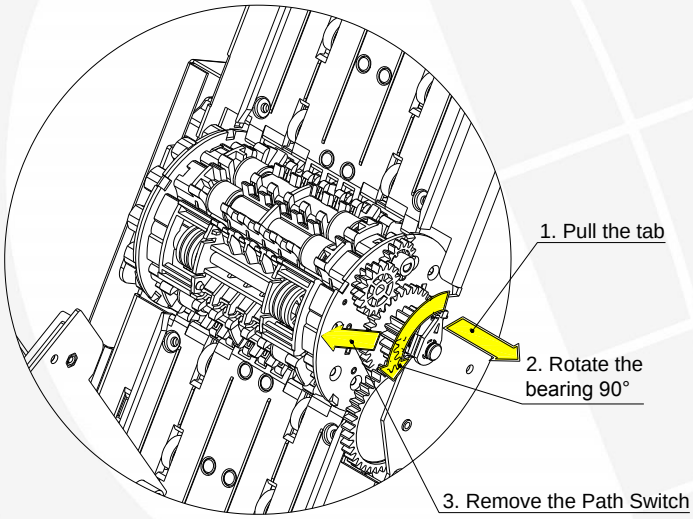
Banknotes are routed:

- from validating head to any recycling cassette or cash collection system
- from any recycling cassette to dispensing cassette or cash collection system
- no other routings are supported

2.10.1. Removing Path Switch

Remove the chassis from the housing (please see section above)

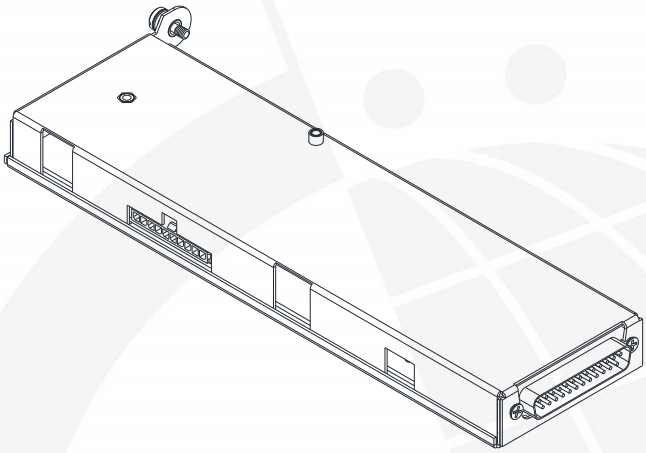
- Open the chassis
- Pull the tab and rotate the bearing 90 degrees,
- Repeat the action with the second bearing at the opposite side of the chassis
- Once both bearings have been released, carefully pull out the path switch from the chassis.



Before placing the switch back in the chassis, make sure the gears on the switch and chassis are aligned. Lock the tabs back in position.

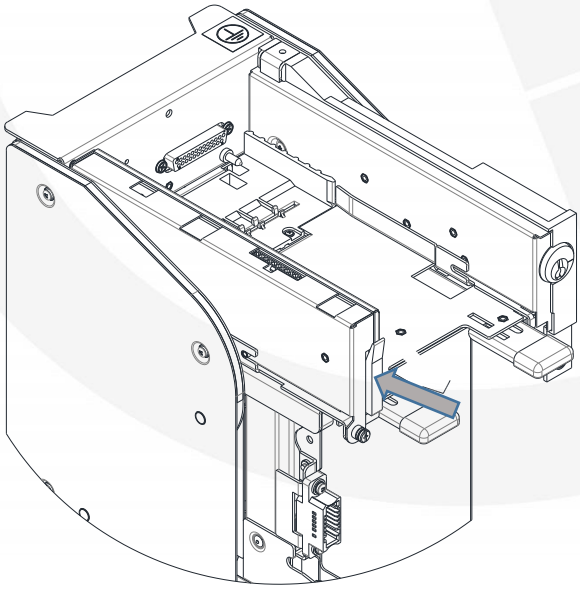
2.11. Power Interface - BBP-5730

The power interface module is located in the housing at the left side of the validating head. This unit handles power and communication with the host.



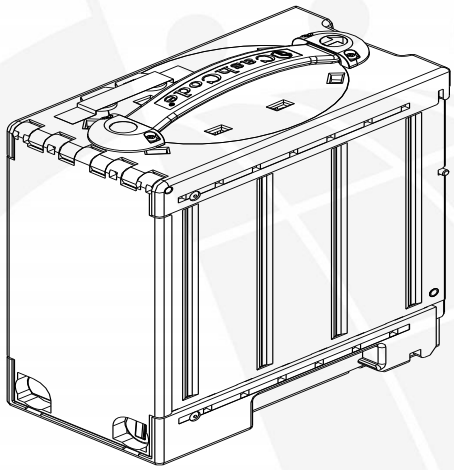
2.11.1. Removing Power Interface Module

- Disconnect power
- Remove the screw located on the front side
- Pull the latch (indicated by arrow) to remove the module



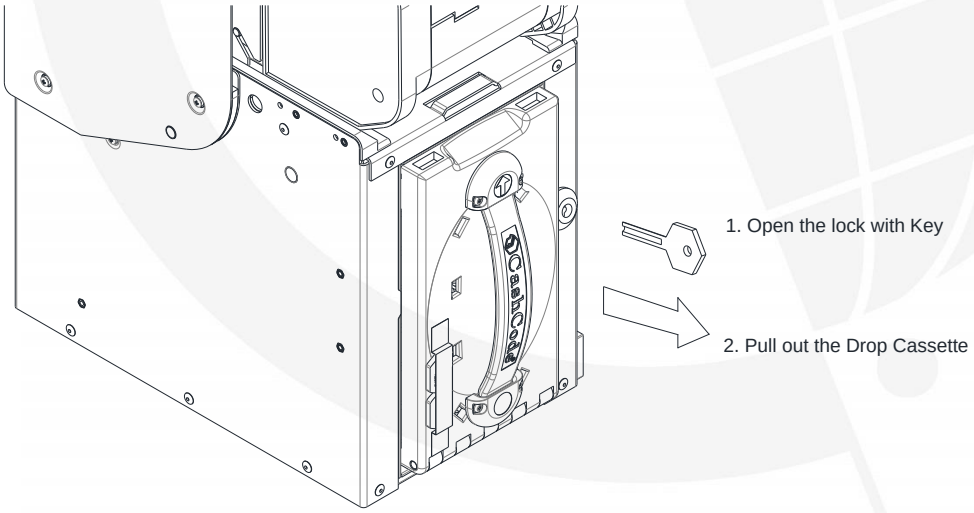
2.12. Cash Box - FLSCT0102

The Cash Box stacks and holds validated bills in a cassette. For added security the cashbox can be locked with two ¾" tubular locks. It can also be locked to the housing with a ¾" tubular lock. A security switch in the housing is used to indicate if the cash box is in position.



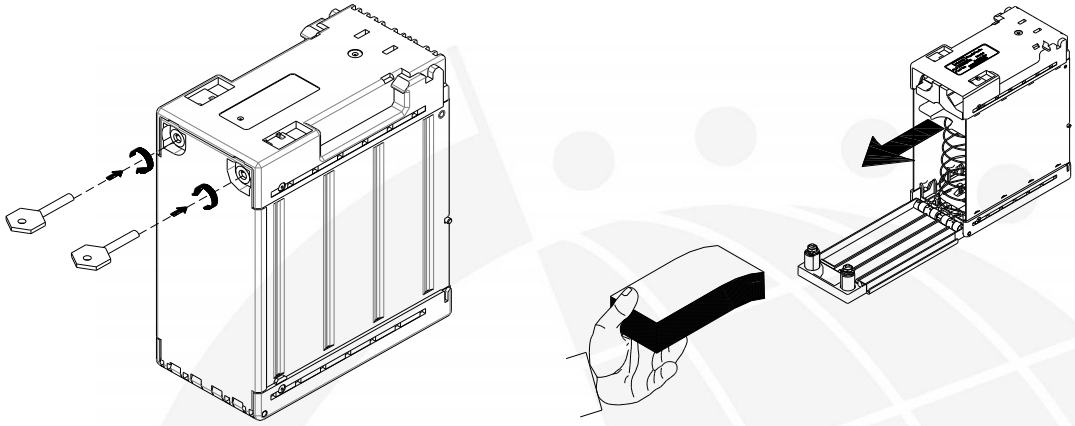
It is equipped with an RFID tag for tracking and identification. It is capable of storing 1000 bills. However this capacity may be diminished with street grade bills.

2.12.1. Removing Cash Box



Unlock the security lock on the housing. Grasp handle and pull out the cash box

2.12.2. Collecting Bills



Unlock cashbox and open the lid. Push stacker plate down and collect bank notes.

2.13. Accessories

Part Number	Description
OPT-PS-BB-CCNET	Power and communication cable with 24 Volt power supply
OPT-HS-BB-CCNET	Power and communication cable
OPT-MKTBB-LOCK1	Chassis Lock Installation Kit (Cam Lock)
OPT-MKTBB-LOCK	Chassis Lock Installation Kit (DOM Lock)
OPT-MKBB-LOCK	Cash Box Locking Kit

2.14. Memory Card

It is important to keep the Bill-to-Bill™ XT firmware up to date to ensure support of new released banknotes. This is accomplished by using memory cards. Different options for memory cards are available.

Single Download Card

Typical part number: TBM-31US1123.
This memory card must be left in the unit for operation.

Multi Download Card

Typical part number: TBM-40US1011-99.
This memory card can be used to update multiple devices depending on the licenses programmed into it.

Network Download Enabled Card

Typical Part Number: BBM-31C08-NDEG.
This memory card acts as a key allowing download of software from a host machine. This method enables easy update of multiple validators when their hosts are connected through a network.

Extended Memory Card

Typical Part Number: TEM-10US1123[-NN]

3. Installation

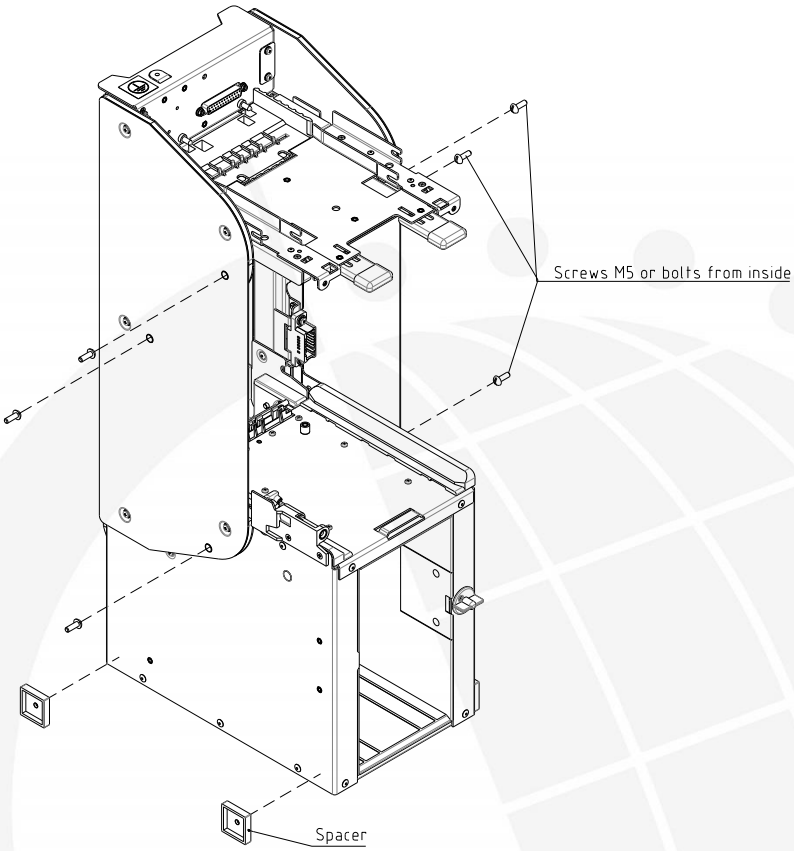
3.1. Installation Instructions

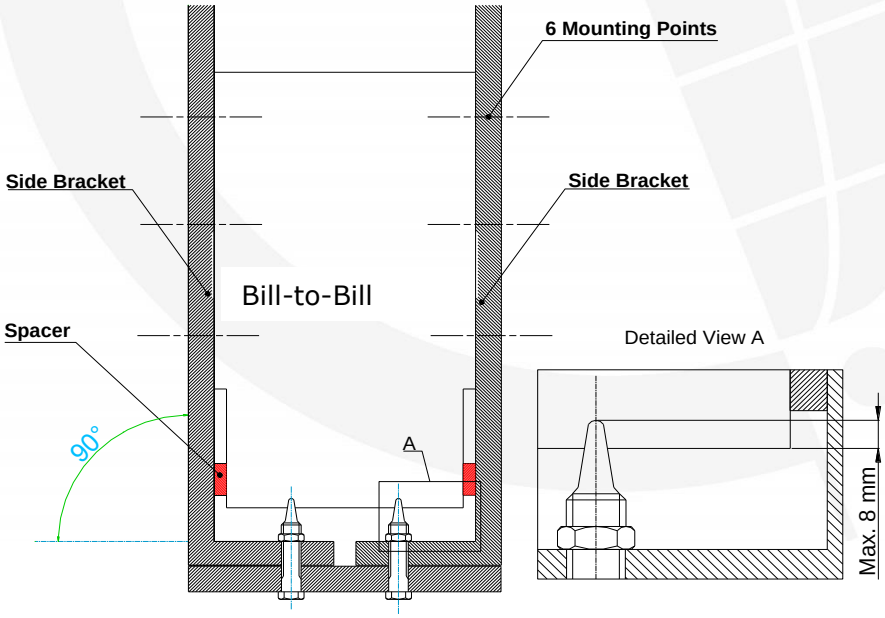
To avoid damage to the device during installation, please ensure:

There are no loose wires, cables or any other obstructions in the mounting area

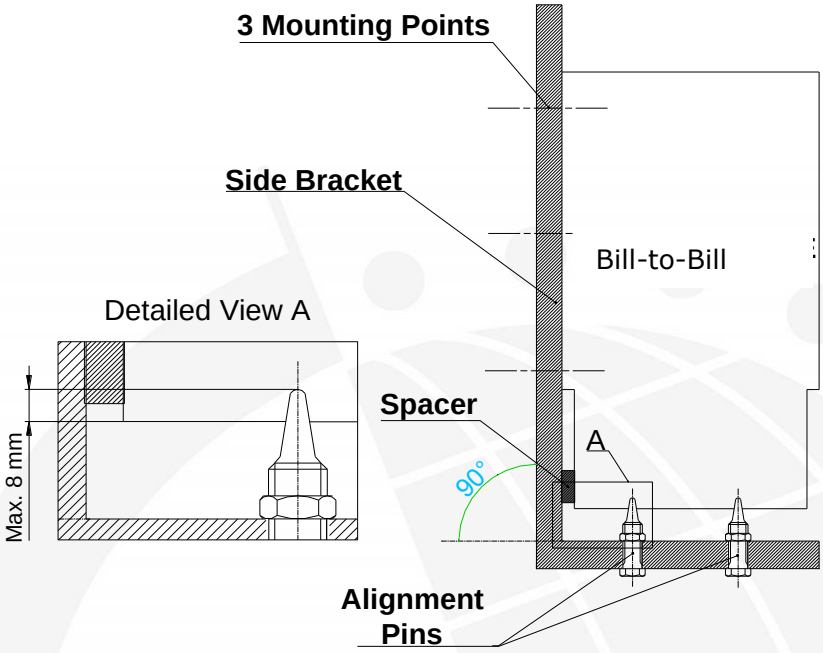
Power and interface cable is not damaged.

The device is installed by using M5 screws on each side of the frame. Additional mounting frame may be required if the position of the mounting holes do not match with the unit.

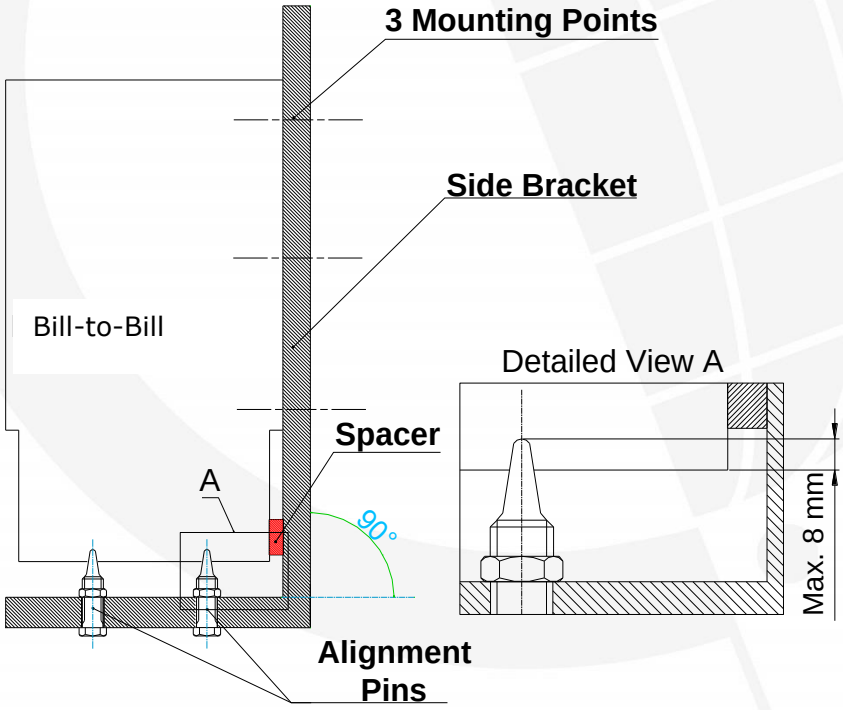




Recommended Installation

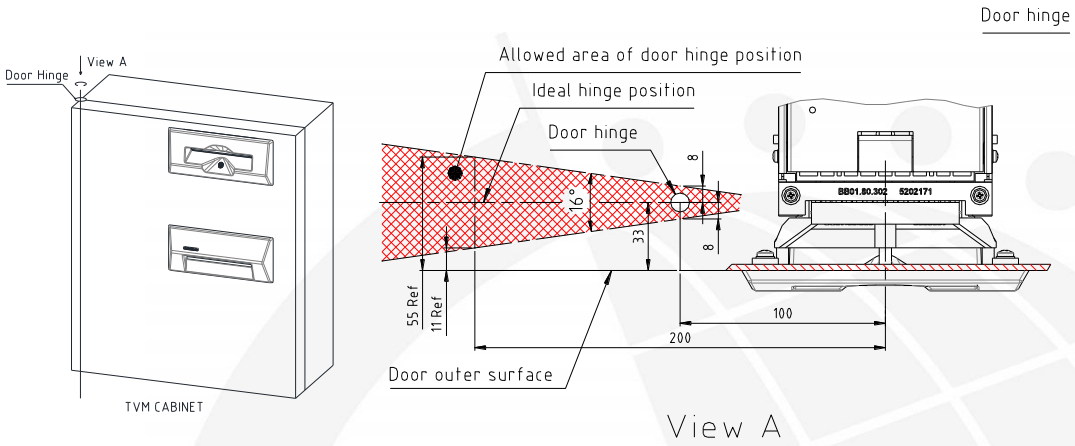


Installation - Left Side Mounting



Installation - Right Side Mounting

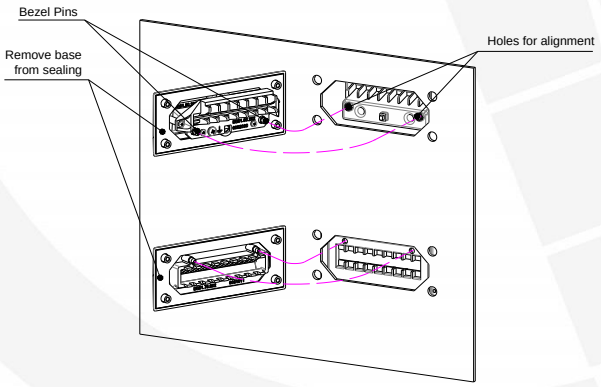
3.2. Installation of Bezels



Door Hinge – Bezel Installation Alignment

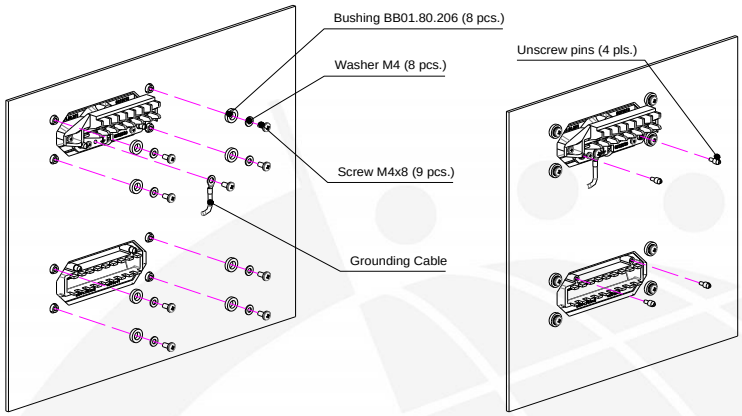
Note: The Door's hinge must be in the area as described above in order to allow proper alignment of the bezels.

Remove the protective film from the back of the bezel and insert the bezels through the door openings making sure the pins align with the inside bezels. The TVM door must be closed at the time of installation in order to have proper distance between the pins and aligning holes.



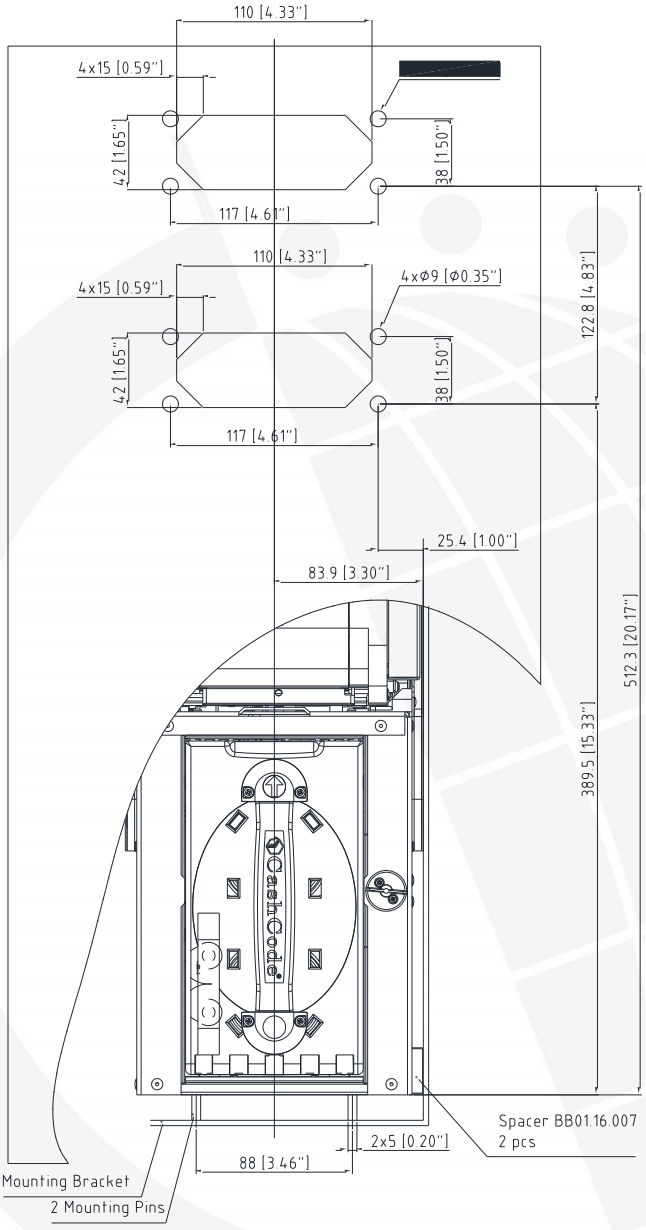
Outside bezel insertion

Fasten the Bezels with M4 screws as described in the figure below.



Mounting Points for outside Bezels

Note: The pins must be removed after the installation to allow proper tolerance between the inside and outside Bezels.

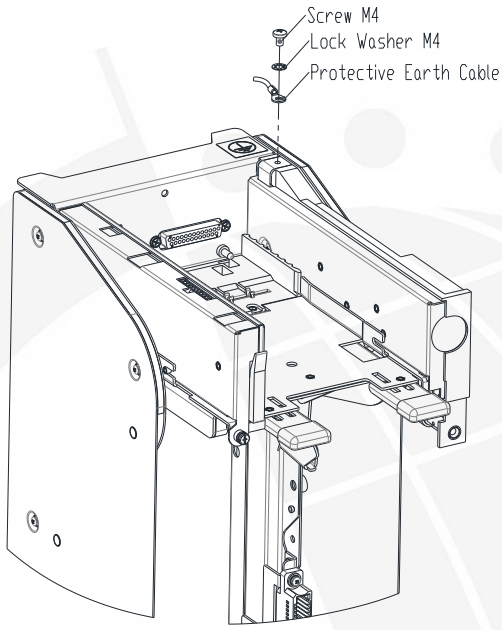


Recommended door openings for installation of bezels

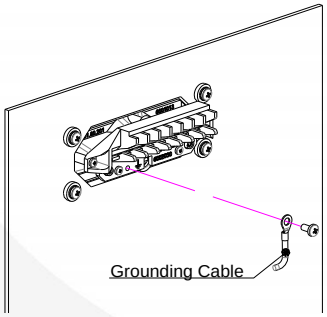
3.3. Grounding

Protective-earth ground terminal must be connected to the automat grounding bus or terminal. Protective earth connection must be made by cable OPT-MKBB-GND or another cooper wire cable with wire gage 14…12 AWG. Use the shortest, practical wire length but

no more than 1.5 meters. Refer to local codes and regulations for grounding requirements.

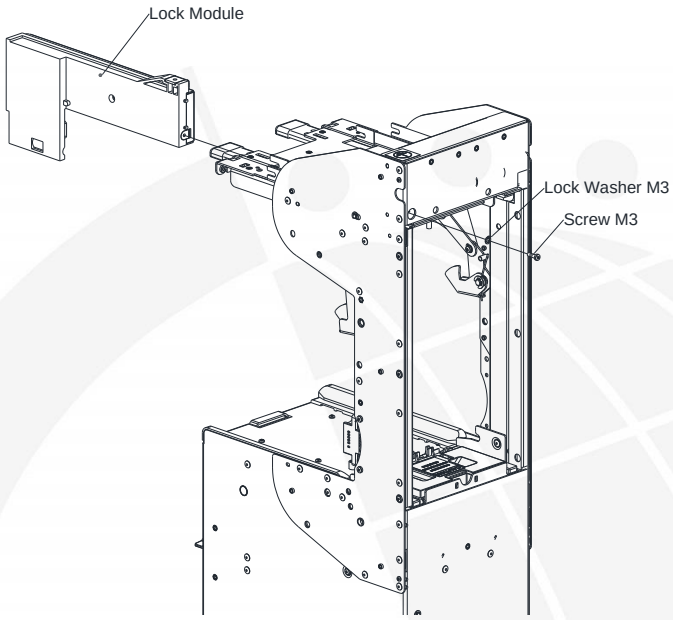


The Validating Head Bezel must be properly grounded to the door, assuming that the door is internally connected to ground.

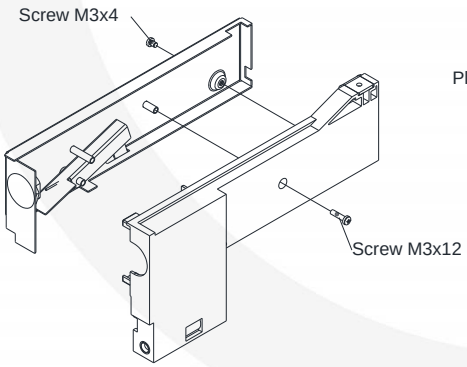


Validating Head Bezel Grounding

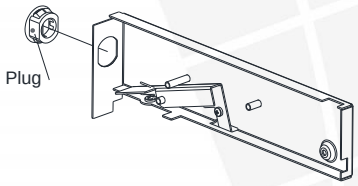
3.4. Security Lock Installation (Chassis)



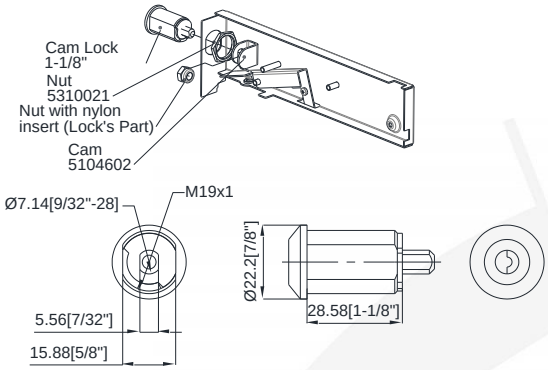
The chassis along with recycling and dispensing cassettes can be locked to the housing with a tubular lock. The lock must be installed in the lock module located on the right side of the validating head. Please follow the steps shown below. Cam and nut shown in below diagrams are included in the locking kits.



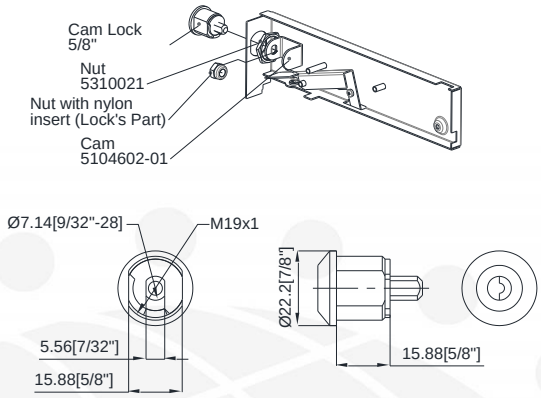
1. Disassemble Lock Module



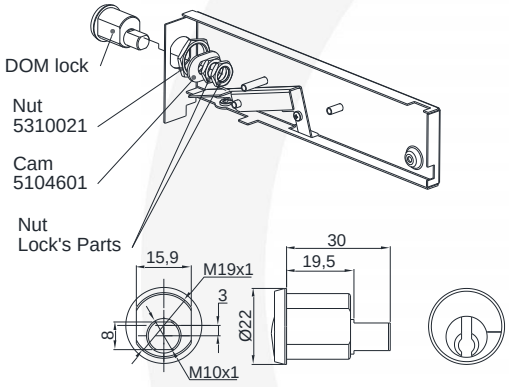
2. Remove Plug



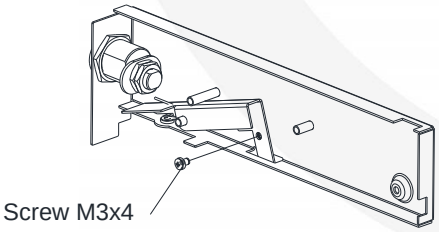
3a. Install 1-1/8” Cam Lock



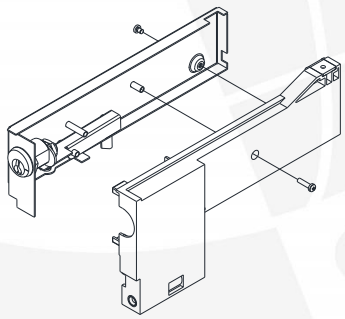
3b. Install 5/8” Cam Lock



3c. Install DOM Lock



4. Unscrew Locking Screw

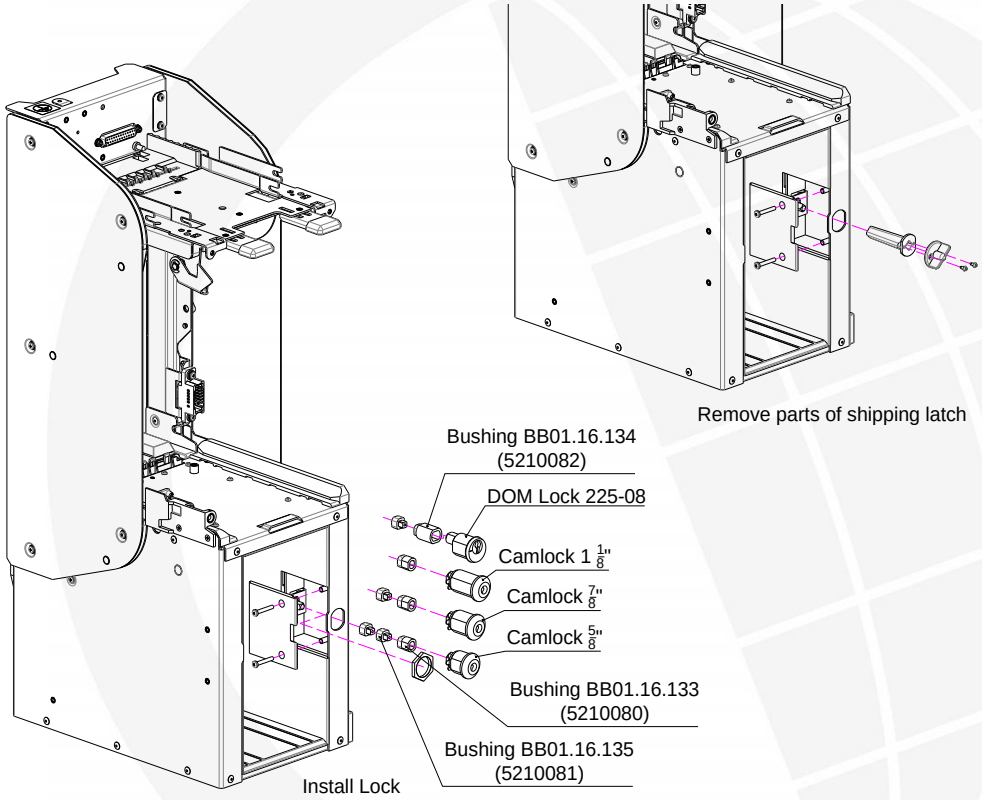


5. Assemble Lock Module

3.5. Security Lock Installation (Housing)

The cash box can be locked to the housing with a ¾" tubular lock. Please follow the steps shown below. Cam, bushing and nut shown in below diagrams are included in the locking kits.

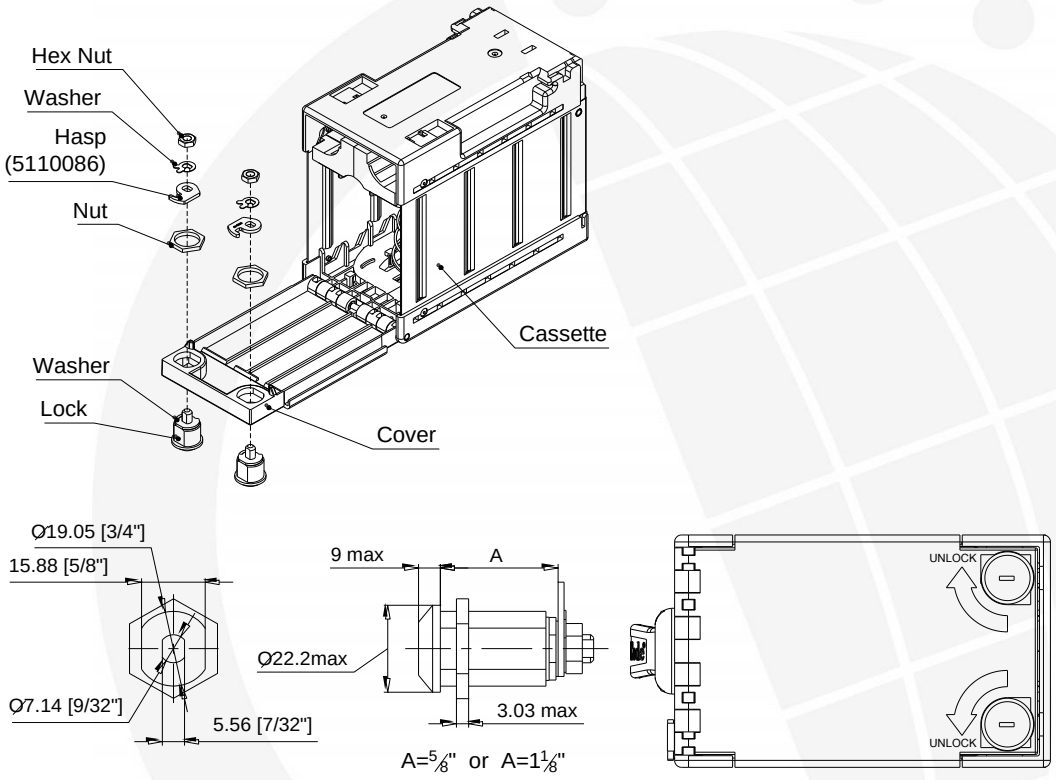
Remove the screw and lock washer from the lock cover.
Remove and discard the washer and spacer
Install the lock and parts, as shown below
Install the cover, screw and lock washer



Cam, bushing and nuts are included in the locking kit OPT-MKBB-LOCK.

3.6. Security Lock Installation (Cash Box)

Two secure locks can be installed onto the Cash Box by removing the supplied plastic lock and plug. Pay special attention to the locking directions. One lock must be locking clockwise and the other anti-clockwise.

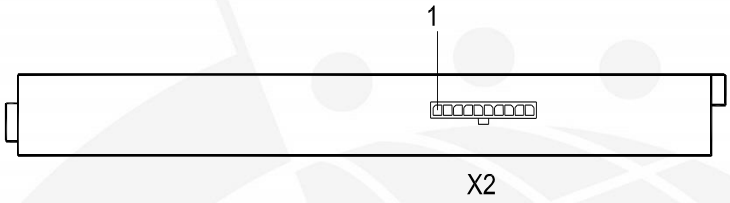


3.7. Security Switch

A security switch located in the housing allows the host machine to detect if a cash box is locked in position. A three colored harness is provided for this purpose. When the cash box is in position, contact between orange and brown terminals opens and contact between orange and red terminals closes.

4. Power & Interface Connection

The power interface module provides power and communication connections through connector X2. Harness OPT-HS-BB-CCNET is supplied for this purpose.



In order to prepare a custom harness, Molex plug 43645-1000 and Molex contacts 43030-0008 must be ordered.

Connector pinout

TERMINAL	SIGNAL	FUNCTION
1	Power	24V
2	Power	24V
3	GND	0 V
4	GND	0 V
5	-	Functional Earth
6	-	Functional Earth
7	COM – TXD	COM Transmit
8	COM – RXD	COM Receive
9	-	Not in use
10	COM - GND	COM common

The lengths of power and interface cables should not exceed 5 meters.

The interface cable must be shielded and the shield connected to pin 6. The shield at the other end must be connected either to the body of host machine or to the grounding bus/ terminal. Communication cables must be either 20, 22 or 24 AWG.

The wires used for the power should be no less than AWG20. Connection from terminals 1, 2, 3 and 4 must be run all the way to the power source by individual wires.

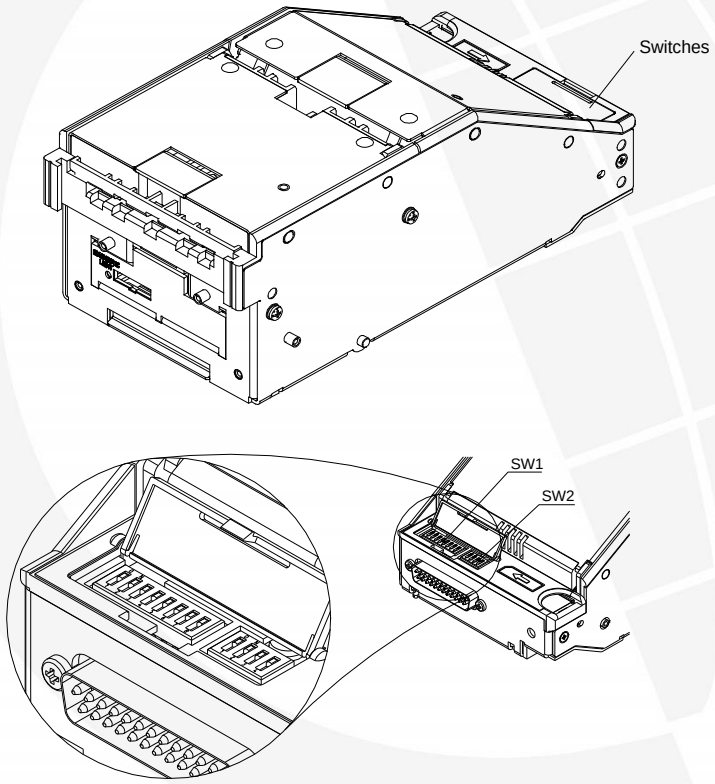
5. Modes of Operation

The Bill-to-Bill™ XT can be set to operate in one of two modes: Host mode or Service mode.

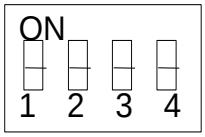
Host mode: In this mode the device requires connectivity from a host controller or an external application.

Service mode: In this mode the device operates as a standalone without external connectivity. This mode is recommended for quick money tests, software updates and troubleshooting.

Switching between the modes as well as configuring other features is accomplished by DIP switches located at the back of the validating head under a transparent cover as shown below. There are two groups of switches.

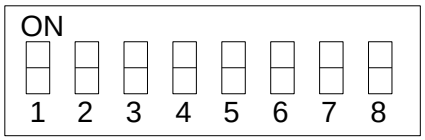


Group of 4



SW 2	ON State	OFF State	Default
SW 2.1	Four Way	One Way	ON
SW 2.2	High	High Security	ON
SW 2.3	9600	19200	ON
SW 2.4	Service	Host	OFF

Group of 8



SW 1	ON State	OFF State	Defaul
SW 1.1	Bill 1 Enable	Bill 1 Disable	ON
SW 1.2	Bill 2 Enable	Bill 2 Disable	ON
SW 1.3	Bill 3 Enable	Bill 3 Disable	ON
SW 1.4	Bill 4 Enable	Bill 4 Disable	ON
SW 1.5	Bill 5 Enable	Bill 5 Disable	ON
SW 1.6	Bill 6 Enable	Bill 6 Disable	ON
SW 1.7	Bill 7 Enable	Bill 7 Disable	ON
SW 1.8	Bill 8 Enable	Bill 8 Disable	ON

The denominations assigned these switches depend on the software in use. Please refer to "Software Description for Bill to Bill Validator" document for details.

6. Software Updates

Software updates can be performed using memory cards or from the host machine.

6.1. Update from Memory Cards

Two types of memory cards are provided to perform updates. Single Load and Multi-load. A single load card must remain in the validating head after update. A multi-load card is used to perform updates on multiple units.

6.1.1. Single Load Memory Card

Follow the process below.

1. Turn power off.
2. Remove the validating head.
3. Remove the old memory card.
4. Install the new memory card.
5. Turn the DIP SW 2.4 to SERVICE mode.
6. Install the validating head.
7. Power on the validator.
8. Wait while the indicator LED completes flashing green/red.
9. Wait until the validator has finished initialisation.
10. Observe the LED turn green.
11. Power down the validator.
12. Turn the Dip SW 4 to COMMUNICATION mode
13. Power on the validator.

6.1.2. Multi Load Memory Card

Follow the process below.

1. Turn power off.
2. Remove the validating head.
3. Remove the old memory card.
4. Install new memory card.
5. Turn the DIP SW 2.4 to SERVICE mode.
6. Install the validating head.
7. Power on the validator.
8. Wait while the indicator LED completes flashing green/red.

9. Wait until the validator has finished initialisation.
10. Observe the LED turn green.
11. Power down the validator.
12. Turn the Dip SW 4 to COMMUNICATION mode.
13. Remove the validating head.
14. Remove the memory card.
15. Install the validating head.
16. Power on the validator.

The card can be used to update more units.

6.2. Update from Host Machine

This method is suited to update Bill-to-Bill™XT when the host machines are connected to a network. The software file is sent to the host machine over the network and downloaded to the device utilising CCNET protocol.

A special memory card called 'Network Download Enable' must be installed in the devices. This card enables the Bill-to-Bill™XT to accept CCNET download instructions.

This functionality must be implemented by the host controller as described in CCNET protocol description d2. Please consult with your sales representative for further information.

6.3. Update Diagnostics

During the update process the bezel LEDs will blink red-green. The LEDs will turn to steady state once the update is completed. In the event of an unsuccessful update, the LED will blink red, with short green flashes. The following table lists errors related to download process.

No of Flashes	Error Condition	Corrective Procedure
1	External interface error	1. Verify that software is suitable for CCNET download. 2. Repeat download process.
2	Memory card CRC error	1. Turn power OFF, remove and reinsert the memory card, turn power ON. 2. Replace memory card with a new one.
3	Incorrect data in memory card	1. Verify that the software is right type for the device. 2. Insert correct type of memory card.
4	Memory card is not inserted	Ensure memory card is properly inserted.
5	Wrong type of memory card	Insert the correct type of memory card.
6	Failure during download	1. Turn power OFF, remove and reinsert the memory card, turn power ON. 2. Replace memory card with a new one.
7	Operation error	1. Turn power OFF, remove and reinsert the memory card, turn power ON. 2. Replace memory card with a new one.

7.Operational Diagnostics

During operation Bill-to-Bill™XT may encounter conditions that may not allow it to complete the task at hand. Such conditions are reported by sending an error code to the host. The error code is displayed on the digital display bezel if the unit is equipped with it. Refer to 'Bill to Bill Error Codes' document.

8. Preventative Maintenance

During operation dust and dirt accumulate on the optical sensors and the rollers in the Validating Head, Dispenser, Chassis and Cash Box. This may result in reduced acceptance rate or lead to occasional jams. Periodic cleaning and maintenance of the unit must be performed for continued operation. Please refer to the serviceability manual for additional information.

9. Contact Information

Technical Support

Email: bill-to-bill@suzohapp.com

Web: http://www.suzohapp.com/bill-to-bill

Service Centers

Please check http://www.suzohapp.com/bill-to-bill.