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RDM-100™ Series

Retail Deposit Module

Integration Guide

Revision A, Aug 24, 2016

P/N 960-000186R_Rev. A {EDP #253995}

Issue #4111-IGE-01-00

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REVISION HISTORY			
Rev №.	**Date**	**Reason for Update**	**Comment**
A	8-24-16	Initial Document	

International Compliance

- RoHS Directives or or or or
- UL & c-UL Marks
- CE Mark
- CB Scheme
- FCC & IC Directives **See Below.**

Electrical Current Symbol

Direct Current: ⎓ indicates Direct Current values on product labels.

Contains Transmitter Module
FCC ID: VZQNRWA3
MODEL NO.: NRWA3
IC: 8285A-NRWA3
This device complies with Part 15 of FCC Rules and RSS-Gen of IC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.

FCC WARNING
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
FCC NOTICE
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
IC NOTICE
This class A digital apparatus complies with Canadian ICES-003.
Cet appareil numerique de la classe A est conforme a la norme NMB-003 du Canada.

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1 GENERAL INFORMATION

Description

This section provides a general overview of the RDM™ Series Retail Deposit Module (RDM-100), pictured in Figure 1. This section is designed to help the user navigate through this guide with ease. It includes the following information:

- RDM-100 Unit
- Model Descriptions
- Precautions
- Primary Features
- Component Names
- Specifications
- Installation
- Connector Pin Assignments
- Preventive Maintenance
- Standard Interface Circuit Schematics
- Operational Flowchart
- Troubleshooting
- Unit Dimensions
- Technical Contact Information

In order to make operating this device and navigating within this manual easier, the following illustrations are used:

- **Safety Instructions** need to be observed in order to protect the operators and the equipment; these are identified with **Bold** text and the following pictographs:
- **Special *Notes*** affect the use of the Banknote Validator; these are identified with *italic* text and the following pictograph:
- **Steps** require the operator to perform specific actions; these are identified with sequential numbers (1, 2, 3, etc.).

RDM-100 Unit

Figure 1 RDM-100 Unit

Model Descriptions

Table 1 lists the product model number descriptions.

Table 1 RDM-100 Model Number Specifications

Nº	Model: RDM-100 - * * * - * * * * - * - * - * Nº (1) (2) (3) (4) (5) (6) (7)
(1)	Cover 0 = Yes 1 = No
(2)	Cash Box Transport Path 0 = Yes 1 = No
(3)	Cable Conveyor 0 = Yes 1 = No
(4)	BAU Validation Country Codes Refer to each country's software specification
(5)	Polymer 0 = Yes 1 = No
(6)	Interface 0 = RS232C 1 = USB2.0(Full-Speed)
(7)	Insertion Guide 0 = None 1 = 75mm Guide (Note Maximum Width 70mm)/ for South Africa, Brazil 2 = 70mm Guide (Note Maximum Width 65mm)/ for USA, etc. 3 = 83mm Guide (Note Maximum Width 82mm)/ for Euro, etc.

Precautions

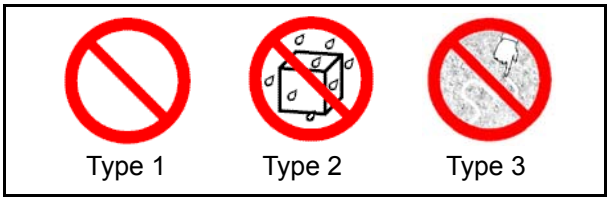


Figure 2 Precautionary Symbols

Symbols in Figure 2 are defined as follows:

1. (Type 1) Do not insert a torn, folded, or wet Banknote; it may cause a jam inside the unit.
2. (Type 2) Do not expose the unit to water. The unit contains several precision electronic devices that can be damaged if water or any liquid is sprayed or spilled into the unit.
3. (Type 3) Do not install the unit in a dusty environment. Dust may affect/degrade the sensor's performance.

USER CAUTIONS

Careful measures were taken in the design of this product to ensure its quality; however, the following cautions pertain to all users and should be followed for safe operation.

Installation Cautions

The Installation Cautions are defined as follows:

1. This unit is not designed for outdoor installation. Be sure the Host Machine contains enough protection to avoid wet or dusty conditions when installing it in both open-air and indoor spaces.
2. Be sure the Host Machine is designed with careful consideration for retrieving a Banknote and/or clearing a Banknote jam.
3. Avoid exposing the Banknote Insertion Slot to direct Sunlight and/or Incandescent Lamp illumination having a Gradient Angle of 15 Degrees or more, and an illumination index of 3000 Lux or less. Insure that the Host Machine is also designed to avoid exposing the Banknote Insertion Slot to direct Sunlight or incandescent light.
4. Do not allow the Unit to endure a range of temperature and humidity beyond the environmental limits specified (See "Environmental Specifications" on page 6).
5. Do not use the Unit in environments that may be subject to extreme temperature changes.
6. Do not use the Unit where it may be exposed to airborne evaporated or sporadic chemicals.
7. Clean and maintain the Unit regularly when located in an excessively smoke filled environment.

Mounting, Dismounting & Transportation

Methods for mounting, dismounting and transporting the unit:

1. Be sure to turn the Power OFF before mounting or removing the Unit from its permanent location. Plugging or unplugging Connector Plugs from their receptacles while the Power is ON may cause damage to the Unit.
2. When installing the Unit, ensure that the Unit is properly replaced in its correct original location and will not move by pulling.
3. Be sure to carry the Unit by both hands when transporting. Holding the Unit by one hand may cause personal injury if the Unit accidentally becomes disassembled and drops away.
4. Be careful not to use excessive outside pressure on the Unit, or subject it to excessive vibration during transportation.
5. Do not throw or pound hard on the Unit. Improper handling may cause personal injury and/or damage to the equipment.

Placing Foreign Objects into the Unit

Observe the following precautions when placing foreign objects into the Unit:

1. Do not insert anything except Banknotes into the Insertion Slot. Inserting Receipts, Stapled Tickets, Rubber Bands, or Credit Cards into the Unit may damage the Banknote Transport path.
2. Do not inject liquids into the Banknote Insertion Slot. Injecting water, oil or cleaning agents may damage the Sensors within the Banknote Transport path.

Preventive Maintenance

The preventive maintenance requirements are defined as follows:

1. When closing the covers of each Unit, ensure that it clicks firmly into place.

Caution: Be careful to avoid personal injury to your fingers when closing the each cover or Transport Assembly.

2. Do not redesign or disassemble the RDM-100. Unauthorized use by inadequately trained personnel, or use outside the original manufacturer's intent for operation voids the warranty.

WARNING: Do not inject water or liquid agents of any kind into the Unit, as this may cause extreme damage to the Unit.

3. Perform routine cleaning and maintenance at least once a month to keep the Unit's performance stable.
4. Use a soft, lint-free cloth, cotton swab or non-flammable compressed air spray to clean dust and debris from the Sensors and Rollers.

WARNING: To minimize risk of damage to internal printed circuit boards, never allow excess fluid (e.g., from a wet cleaning cloth) to drip or leak into the device. Internal printed circuit boards may be damaged. Do not use any alcohol, citrus based cleaners, solvents or scouring agents that can damage the plastic surfaces of the device.

5. If the Unit is exposed to water or liquids, use a clean, dry micro-fiber cloth to wipe off and absorb excess liquids immediately. Any remaining liquids may affect and degrade the Sensors and Validation component performance.

Caution: Make sure Interface Harness connections to the Host Machine are shorter than 9.84 Feet (3 Meters) in length. Cut off all unused portions of the Interface Harness wiring to avoid static electrical effects or short circuit possibilities that could cause damage to the Unit.

WARNING: This Unit is designed for use with a Current limiting Power Source! Design the Host Cabinet space to meet all local related safety standards.

Banknote Fitness Requirements

The following Banknote types may not validate correctly, or worse, can cause a jam and/or damage to the unit's Transport Path. Banknotes exhibiting the following conditions illustrated in Figure 3 should be avoided:

- torn
- excessive folds or wrinkles
- dirty
- curled
- wet
- containing foreign objects and/or oil

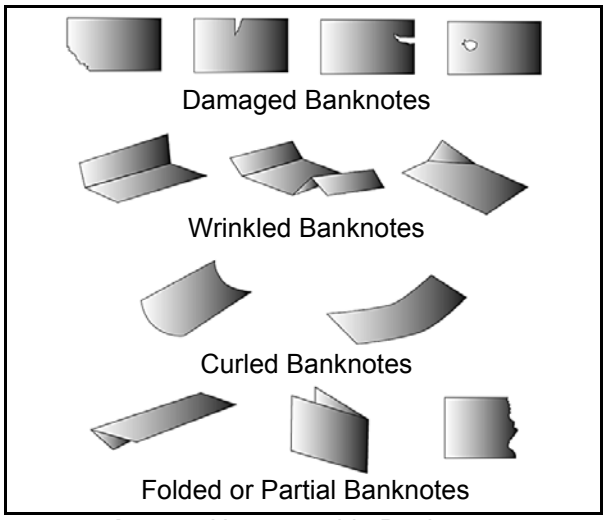


Figure 3 Unacceptable Banknotes

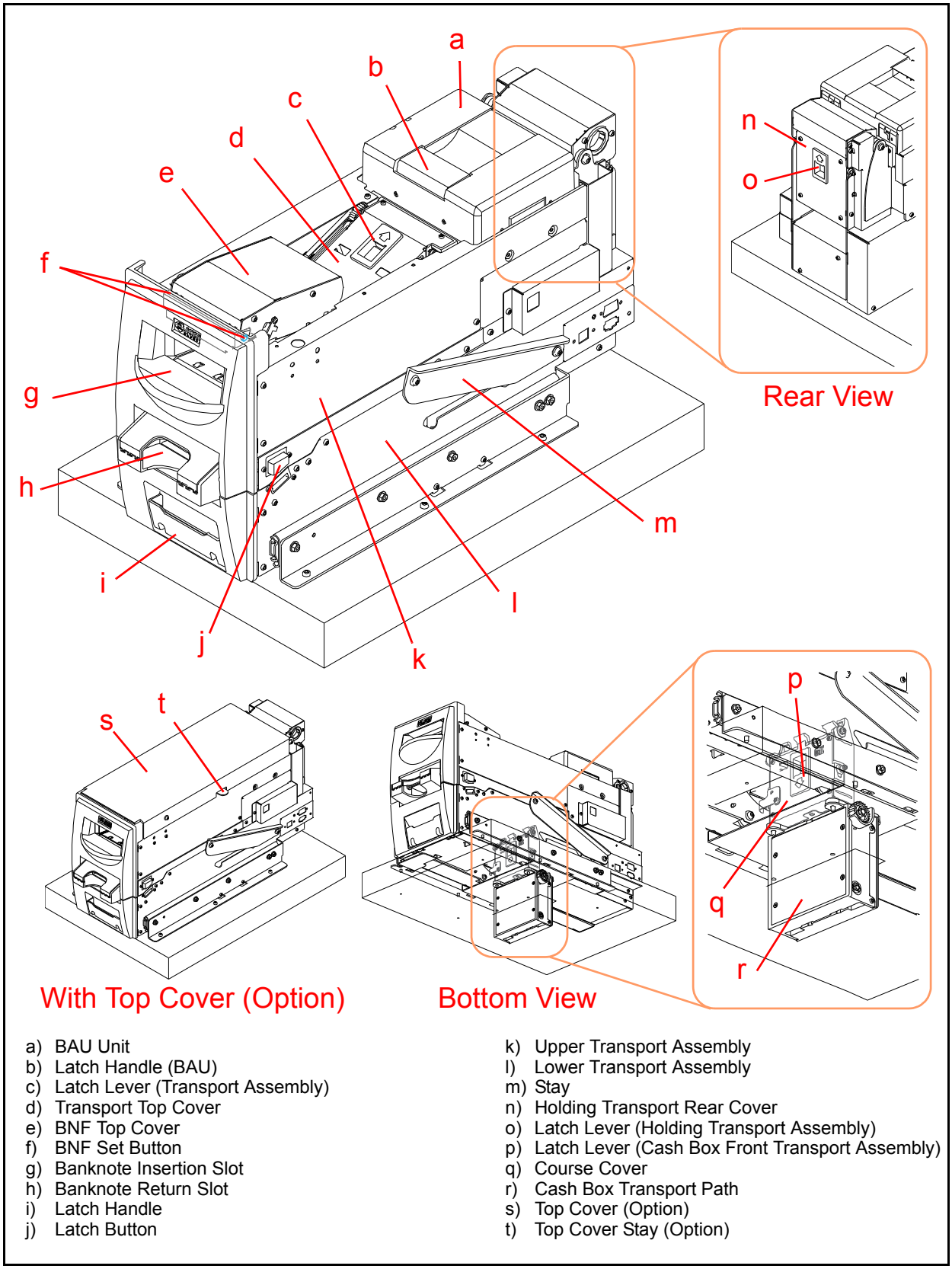
Primary Features

This RDM-100 Series Retail Deposit Module contains the following primary features:

- **250 Note Capacity BNF –** Two hundred fifty Banknotes can be inserted into the BNF Insertion Slot at one time.
- **High-Speed Processing –** The deposit processing speed is 6 Notes per second (150mm Banknotes).
- **Deposit Module featuring the BAU Unit –** High-Speed and High-Performance Banknote Acceptor Unit; the BAU is featured as the Validation Unit. The Banknotes validated by the BAU are stacked into the Cash Box. Banknotes that can not be validated as authentic are returned to the Return Tray.

Component Names

Figure 4 illustrates the RDM-100 component names and locations.



a) BAU Unit
b) Latch Handle (BAU)
c) Latch Lever (Transport Assembly)
d) Transport Top Cover
e) BNF Top Cover
f) BNF Set Button
g) Banknote Insertion Slot
h) Banknote Return Slot
i) Latch Handle
j) Latch Button
k) Upper Transport Assembly
l) Lower Transport Assembly
m) Stay
n) Holding Transport Rear Cover
o) Latch Lever (Holding Transport Assembly)
p) Latch Lever (Cash Box Front Transport Assembly)
q) Course Cover
r) Cash Box Transport Path
s) Top Cover (Option)
t) Top Cover Stay (Option)

Figure 4 RDM-100 Component Names

2 SPECIFICATIONS

Technical Specifications

Table 2 RDM-100 Technical Specifications

Acceptance Rate*:	99% or greater (Accept Priority Mode: 99.9% or greater†) The following banknote types are excluded: • Banknotes with excess or poor magnetism or unclear graphics • Double (dual) Notes • Worn, dirty, wet, stained, torn or excessively wrinkled Banknotes • Banknotes having folded corners or edges • Banknotes having the wrong cut dimensions or printing displacement • Returned Banknotes because of incorrect or failed insertion.
Acceptable Denomination:	200 Denomination Maximum
Banknote Types Accepted:	• Long side: 110-177mm (4.33-6.97 in.) ‡ • Short side: 60-85mm (2.36-3.35 in.)
Insertion Direction:	Four-Way
Bulk Feed:	Approximately 250 Notes Maximum (US Dollar/New Banknote)
Processing Speed:	6 Notes per second (150mm Banknotes)
Return Tray Capacity:	Approximately 20 Notes Maximum
Separate Cash Box** Usable:	Cash Box Transport Path guides the Banknote into Cash Box and is attached with screws from the upper surface or from inside the Cash Box
Validation Method:	Refer to “BAU Operation and Maintenance Manual”
Diagnostic Indicators:	LED Insertion Slot LED: Idle = Green Lit / Insertion = Green Flash Misaligned = Yellow Flash / Error = Red Flash Dispense Slot LED: Banknote Detection = Blue Flash no Banknote = extinguished
Interface††:	Host: RS232C, USB 2.0 (Full-Speed) BAU: USB 2.0 (Full-Speed) (for BAU Template Download)

*. Refer to the specific Country’s “Software Information Sheet” for each Country’s particular Banknote acceptance rate.

†. In this case, acceptable country has priority.

‡. Use the other return tray if the Long Side is greater than 160mm.

**.Separate Cash box is supplied by the OEM.

††.The Interface Harness connecting to the Host should be less than 3m (9.84 ft).

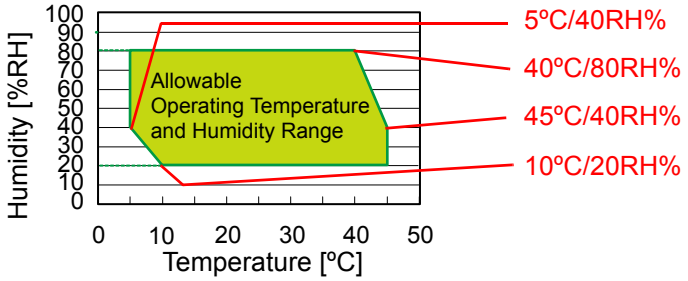
Environmental Specifications

Table 3 RDM-100 Environmental Specifications

Operating Temperature:	+5ºC to +45ºC (41ºF to 113ºF)*
Storage Temperature:	-20ºC to +60ºC (-4ºF to 140ºF)*
Relative Operating Humidity:	20% to 80% RH (non-condensed)
Relative Storage Humidity:	10% to 90% RH (non-condensed)
Visible Light Sensitivity:	Avoid light on the Banknote Insertion/Return Slots having an Illumination index of 3000 Lux or less and if warm color incandescent light range radiant of 0 to 45 degrees from all sides or if light from a Mercury Lamp a radiant angle between 10 to 85 degrees
Installation:	Indoors Only (Built-in) Fixture material/shape must endure 55kg weight without distortion

*. Depends on hydrothermal conditions.

Hydrothermal Condition Table



Electrical Specifications

Table 4 RDM-100 Electrical Specifications

Supply Voltage*:	24V DC ±10%
Current Consumption:	24V DC • Standby = 0.4A • Operation = 3.2A • Peak = 4.7A

*. Use a Current Source Limiting Power Supply

Structural Specifications

Table 5 RDM-100 Structural Specifications

Weight:	Unit: Approximately 17kg (37.48lbs.)
Mounting:	Built-in
Outside Dimensions:	See “Entire Unit Outside Dimensions” on page 33 of this Manual

3 INSTALLATION

This section provides installation and operating instructions for the RDM-100 Banknote Validator unit. The information within this section contains the following features:

- Installation Procedure
- RDM-100 Installation Dimensions

Installation Procedure

To prepare the RDM-100 to Cash Box mounting platform, six (6) holes are required to attached the Rail Brackets, four (4) holes to install the Cash Box Transport Guide Frame and a 123x42mm rectangle cutout for placing the Cash Box Transport Assembly (Figure 5).

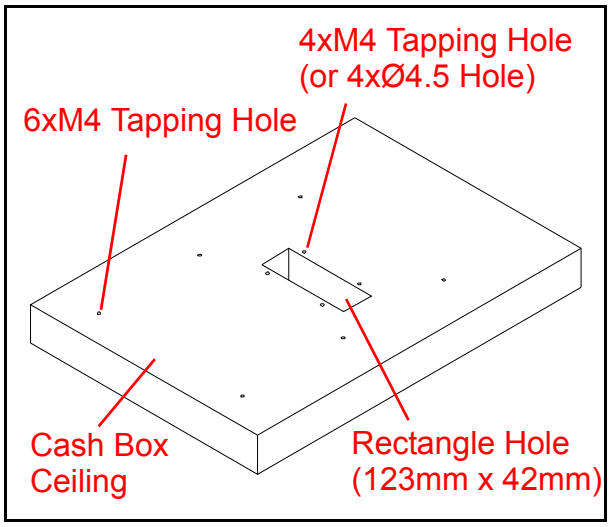


Figure 5 Set Up Holes

UNIT INSTALLATION

Perform the following steps to install the RDM-100 Unit:

1. Confirm that the Rail Brackets (Figure 6 a) were installed on both sides of RDM-100 Unit.

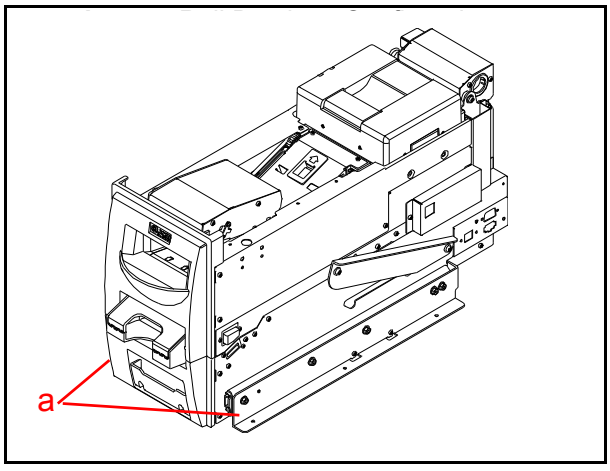


Figure 6 Rail Brackets Confirmation

NOTE: There are three (3) Installation Holes on each Rail Bracket.

2. Position the RDM-100 Unit to align the Rail Bracket Installation Holes on the Cash Box Ceiling to the Rail Brackets Holes. Attach the Rail Brackets to the Cash Box Ceiling with the six (6) M4x8 (or greater) Screws with Washers (Figure 7 a_1 to a_6).

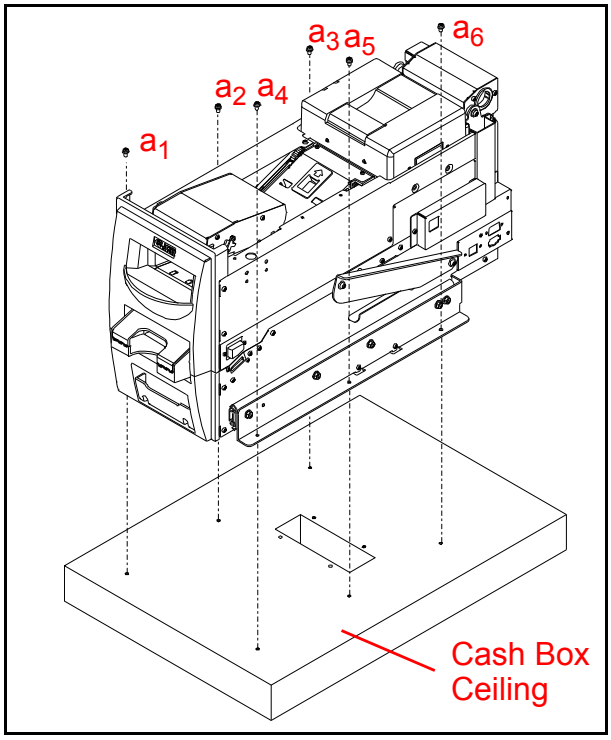


Figure 7 Rail Brackets Holes

3. Withdraw the RDM-100 Unit from the home position on the Cash Box Ceiling.

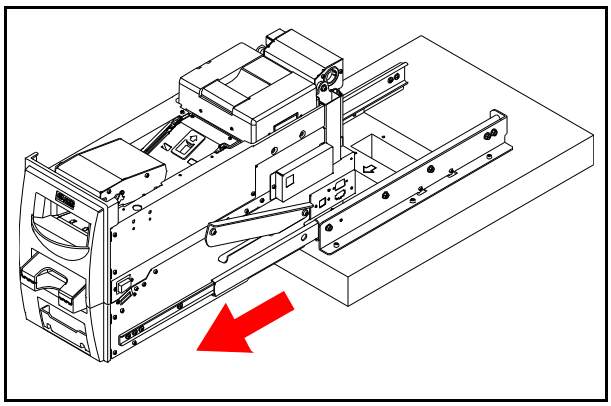


Figure 8 Unit Withdrawal

4. Attach the Cash Box Transport Path with the four (4) M4 Screws.

Top Side Mounting

When the top side mounting is preferred, attach the Cash Box Transport Path by the four (4) M4 Screws (Figure 9 a_1 to a_4) from the top side of the Cash Box ceiling.

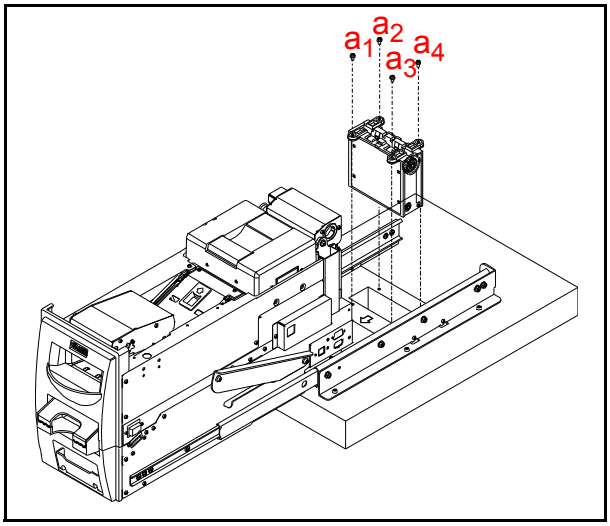


Figure 9 Top Side Mounting

Bottom Side Mounting

When the bottom side mounting is preferred, insert the four (4) M4 Screws M4 Screws (Figure 10 b_1 to b_4), of the proper length, from the bottom side of the Cash Box Ceiling securing the Cash Box Transport with Nuts (Figure 10 a_1 to a_4) to the top side.

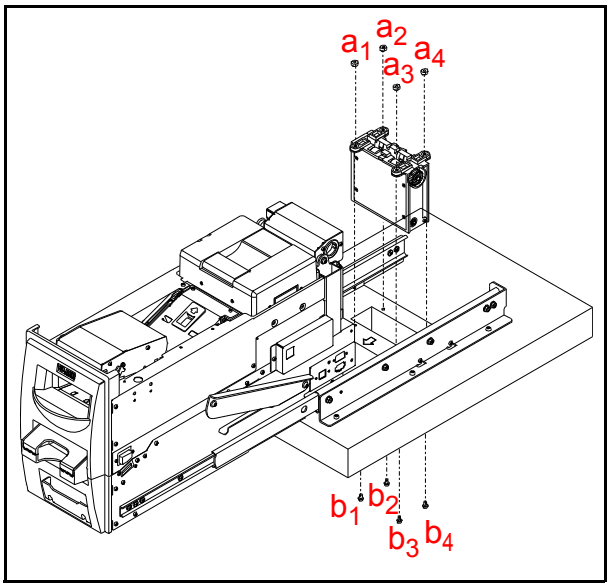


Figure 10 Bottom Side Mounting

NOTE: The Screw Length is considered as the Cash Box Ceiling thickness + approximately 7mm.

5. Place the RDM-100 Unit to the home position.

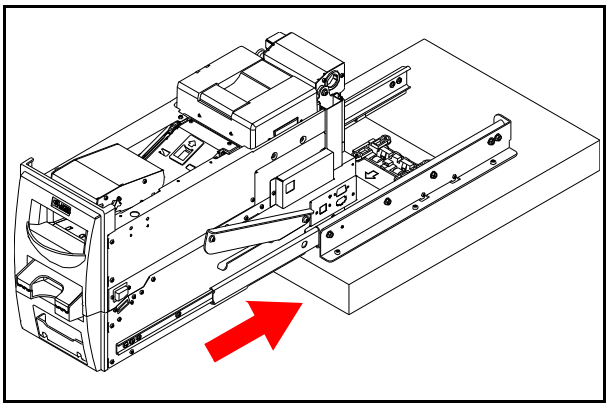


Figure 11 Home Position

6. Confirm that the RDM-100 Unit is firmly installed without backlash.

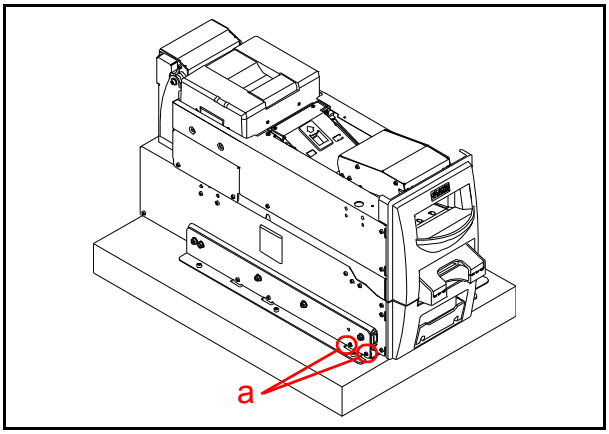


Figure 12 Latch Plate Positioning

NOTE: Re-adjust the Latch Plate position in order to eliminate movement of the Unit by tightening two (2) Screws (Figure 12 a)

7. Slide the RDM-100 Unit forward and backward and confirm the movement is smooth.

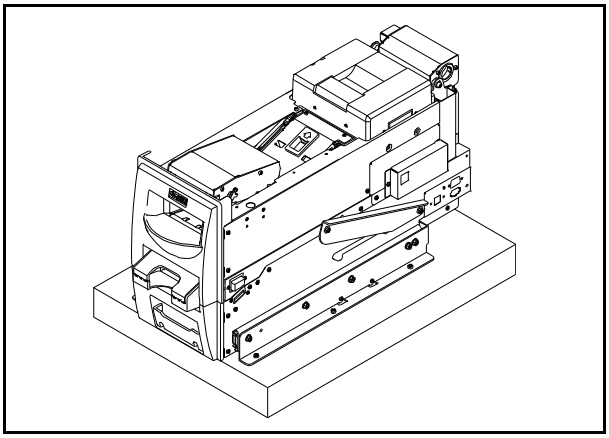


Figure 13 Latch Plate Positioning

This completes the RDM-100 Unit Installation.

RDM-100 INSTALLATION DIMENSIONS

Figure 14 illustrates the RDM-100 Installation Dimensions

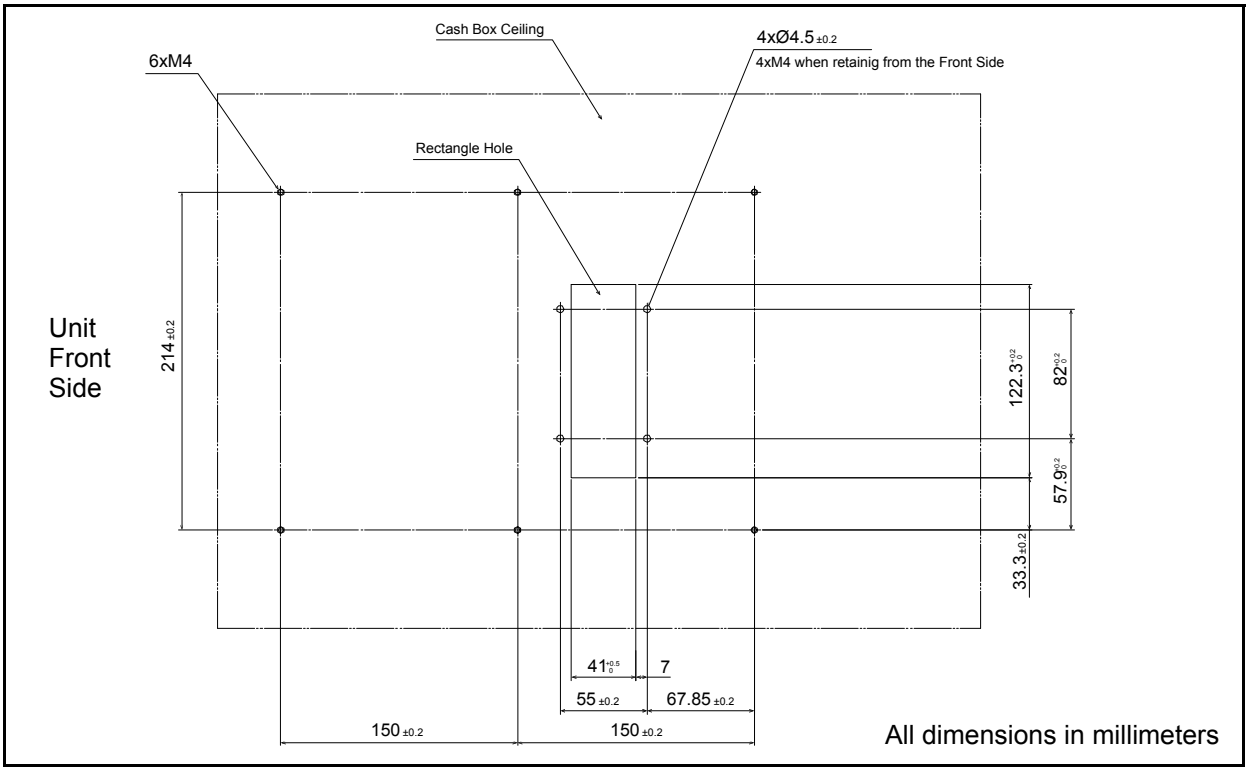


Figure 14 RDM-100 Installation Dimensions

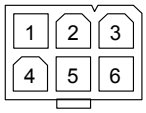
4 CONNECTOR PIN ASSIGNMENTS

Table 6 through Table 8 list the RDM-100 Unit's pin assignments.

POWER SOURCE PIN ASSIGNMENTS

Table 6 lists the RDM-100 Power Source Pin Assignments.

Table 6 RDM-100 Power Source Pin Assignments*



Connector: 5559-06P (MOLEX) / UL94V-2
Mating Connector: 5557-06R (MOLEX) / UL94V-2
5557-06R-210 (MOLEX) / UL94V-0

Pin No.	Signal Name	I/O†	Function
1	+24V	-	+24V DC Power Supply
2	+24V	-	+24V DC Power Supply
3	GND	-	GND
4	GND	-	GND
5	FG	-	Host Frame Ground
6	NC	-	Not Connected

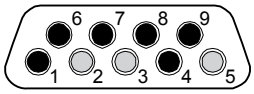
*. Be sure to remove electrical power when connecting/disconnecting the Power Harness.

†. I/O (input/output) is the terminal as viewed from the Banknote Unit's backside.

RS232C INTERFACE PIN ASSIGNMENT

Table 7 lists the RDM-100 RS232C Interface Pin Assignments.

Table 7 RDM-100 RS232C Interface Pin Assignments *



Connector: JEC-9S-3 (JST) / D-SUB 9-Pin Female
Mating Connector: D-SUB 9-Pin Male

Pin No.	Signal Name	I/O†	Function
1	NC	-	Not Connected
2	TXD	O	Send data from the RDM-100‡
3	RXD	I	Receive data to the RDM-100**
4	NC	-	Not Connected
5	GND	-	GND
6	NC	-	Not Connected
7	NC	-	Not Connected
8	NC	-	Not Connected
9	NC	-	Not Connected

*. Be sure to remove electrical power when connecting/disconnecting the Communication Harness.

†. I/O (input/output) is the terminal as viewed from the Banknote Unit's backside.

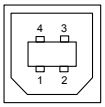
‡. The signal name is considered from the RDM-100 side. Connect to the Host receiver side.

**.The signal name is considered from the RDM-100 side. Connect to the Host driver side.

USB CONNECTOR PIN ASSIGNMENT

Table 8 lists the RDM-100 USB Connector Pin Assignments.

Table 8 RDM-100 USB Connector Pin Assignments *



Connector: USB Type B Receptacle
Mating Connector: USB Type B Plug

Pin No.	Signal Name	I/O†	Function
1	VBUS	-	USB VBUS
2	D-	I/O	USB D-
3	D+	I/O	USB D+
4	GND	-	USB GND‡

*. Be sure to remove electrical power when connecting/disconnecting the Communication Harness.

†. I/O (input/output) is the terminal as viewed from the Banknote Unit's backside.

‡. The shell part of the GND and the connector is connected inside of the unit.

5 PREVENTIVE MAINTENANCE

Clearing a Banknote Jam

To retrieve a jammed Banknote located inside the RDM-100 Unit, perform the following steps.

OPTION TOP COVER OPEN/CLOSE

When the Optional Top Cover for the RDM-100 Units is used, the Top Cover needs to be opened to access the Upper Transport area. When a banknote jam is suspected, perform the following steps to open the Top Cover:

1. Hold the right and left side of the Top Cover rear and lift up.

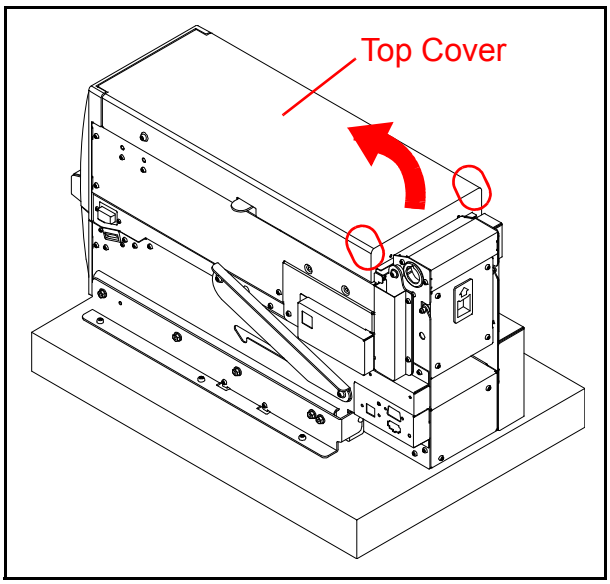


Figure 15 Opening Option Top Cover 1

2. Confirm that the Top Cover Stay is hooked firmly in the cutout before letting loose of the cover.

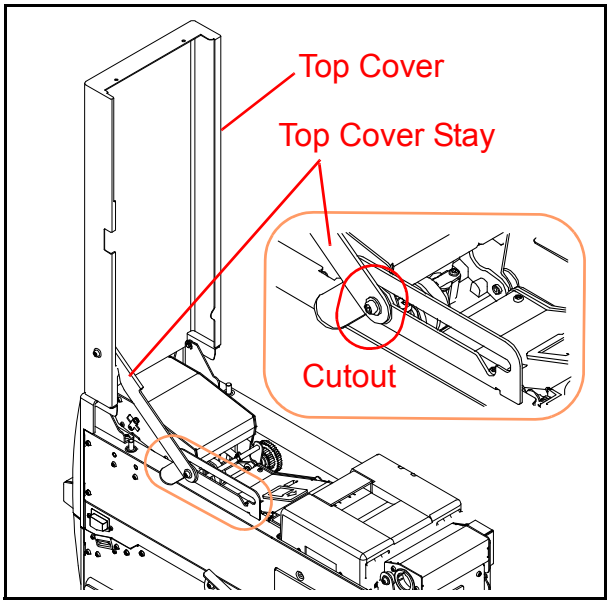


Figure 16 Opening Option Top Cover 2

BNF ASSEMBLY BANKNOTE JAM

Perform the following steps to clear the Banknote Jam within the BNF Assembly:

1. Open the BNF Top Cover while pressing the BNF Set Button located on both sides of the BNF Top Cover.

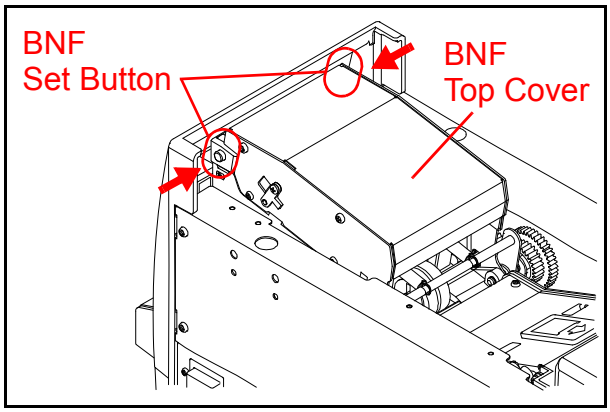


Figure 17 BNF Set Button

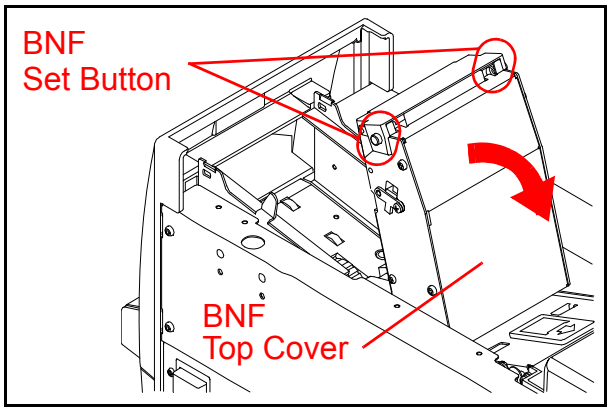


Figure 18 BNF Top Cover Open

2. If a Banknote is detected in the BNF Transport Path, remove the jammed banknote.

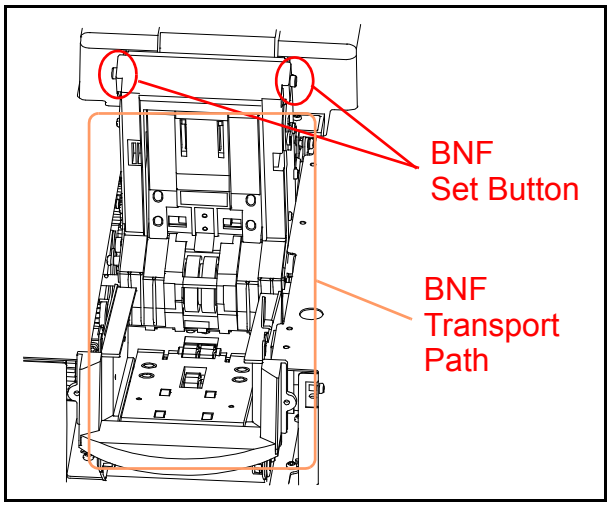


Figure 19 BNF Transport Path

TRANSPORT ASSEMBLY BANKNOTE JAM

Perform the following steps to clear a Banknote Jam within the Transport Assembly:

1. Open the Transport Assembly Top Cover while pressing the Latch Lever located in the middle of Transport Assembly in the direction indicated by the engraved arrow.

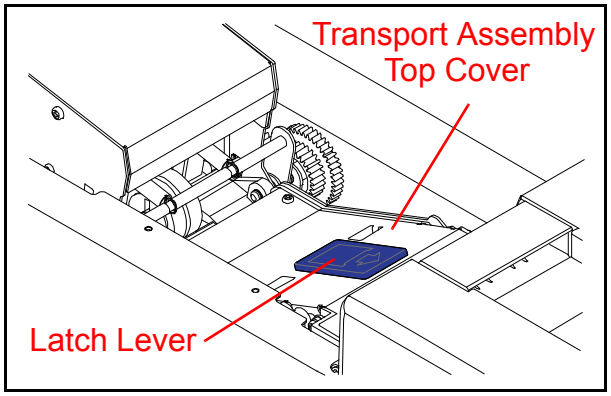


Figure 20 Transport Assembly Latch

2. If a jammed banknote exists in the Transport Assembly, remove the banknote.

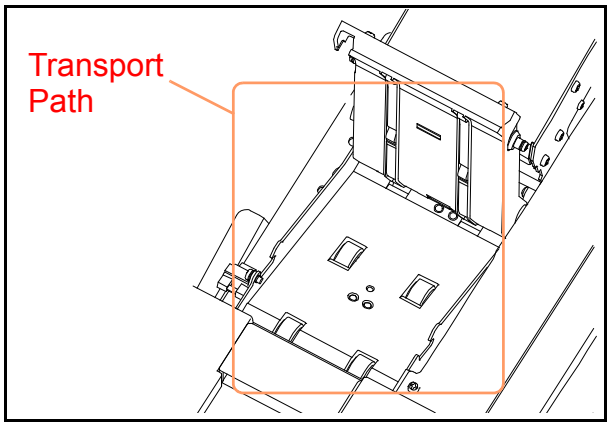


Figure 21 Transport Path

BAU BANKNOTE JAM

Perform the following steps to clear a Banknote Jam within the BAU:

1. Pull the Latch Handle of the BAU.
2. Open the BAU Upper Chassis.

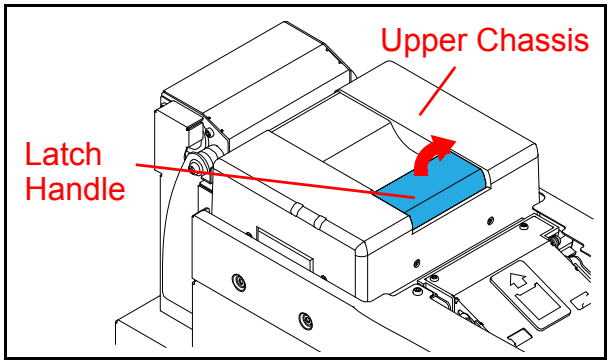


Figure 22 BAU Latch

3. If a Banknote is detected in the BAU Transport, remove the jammed banknote.

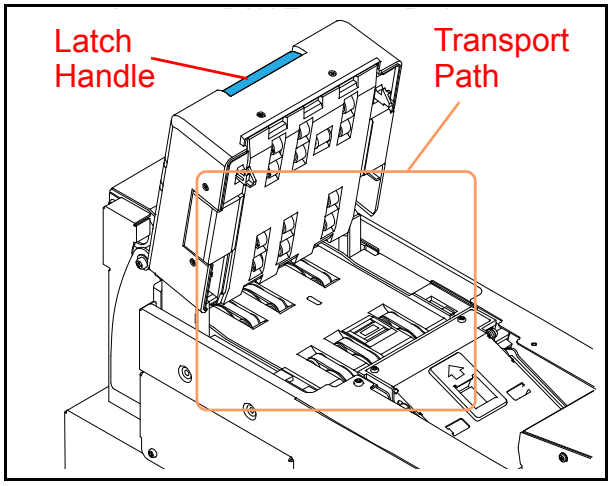


Figure 23 BAU Transport Path

HOLDING TRANSPORT REAR ASSEMBLY BANKNOTE JAM

Perform the following steps to clear a Banknote Jam within the Holding Transport Rear Assembly:

1. To open the Holding Transport Rear Cover, press the Latch Lever in the direction indicated by the engraved arrow and pull the Rear Cover open.

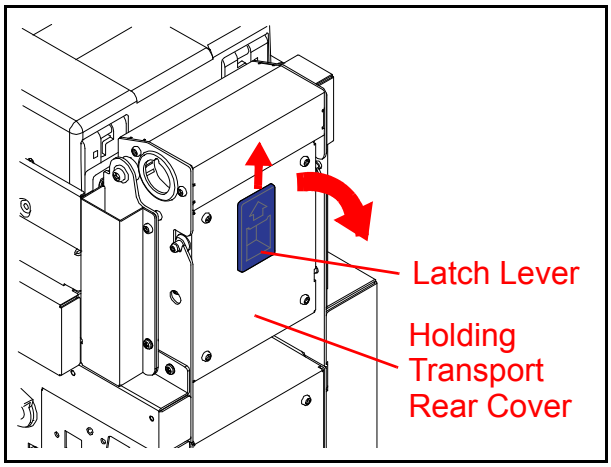


Figure 24 Holding Transport Rear Cover Latch

2. If a jammed Banknote is detected, remove the jammed banknote.

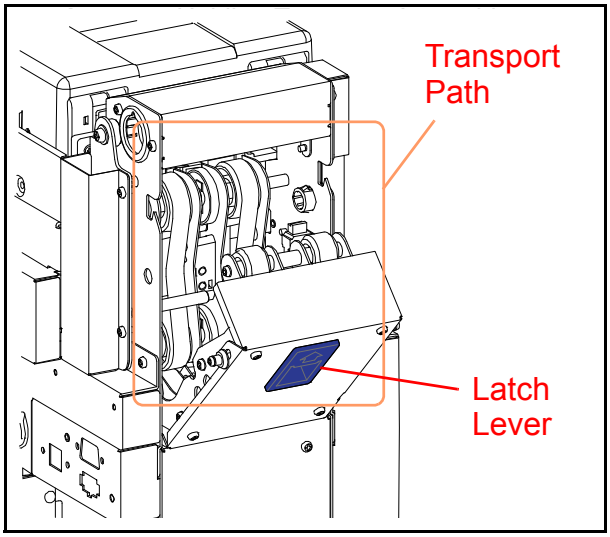


Figure 25 Holding Transport Assembly

Upper and Lower Transport Assembly Banknote Jam

Perform the following steps to clear the Banknote Jam within the Upper and Lower Transport Assembly:

1. While pressing the Transport Assembly Latch Button in the direction of the engraved arrow, lift the Upper Transport Assembly with both hands to open.

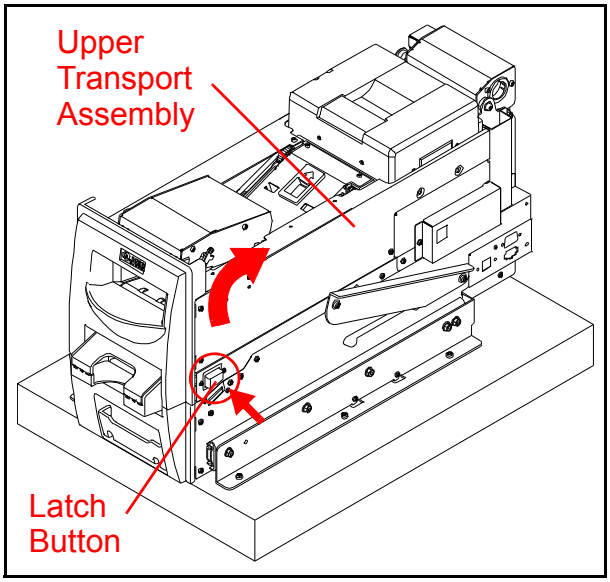


Figure 26 Holding Transport Rear Cover Latch

2. Confirm the Stay is firmly hooked to the most forward cutout before letting loose of the Upper Transport Assembly.

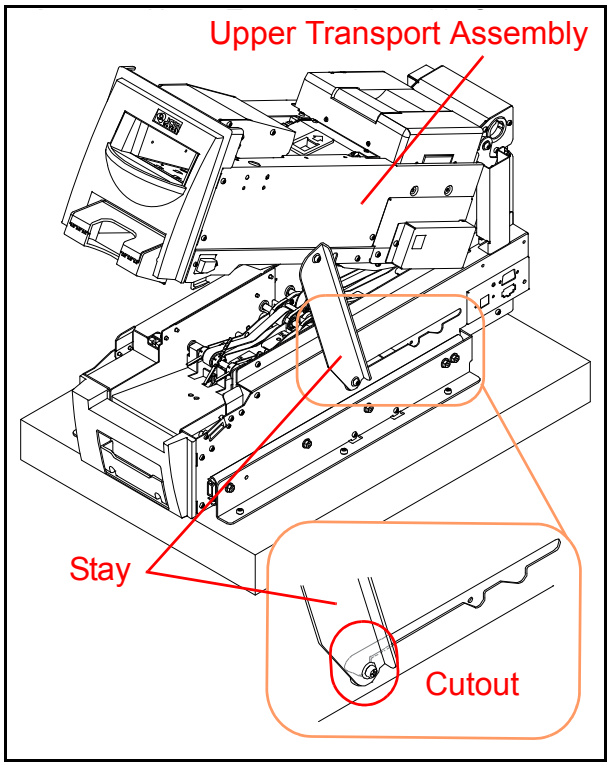


Figure 27 Upper Transport Assembly Open

> *Caution: Confirm that the Stay is firmly hooked in the cutout before letting loose of the Upper Transport Assembly otherwise the Transport Assembly may close due to the weight of the Assembly.*

3. If a jammed Banknote is detected in the Transport Path, remove the jammed Banknote.

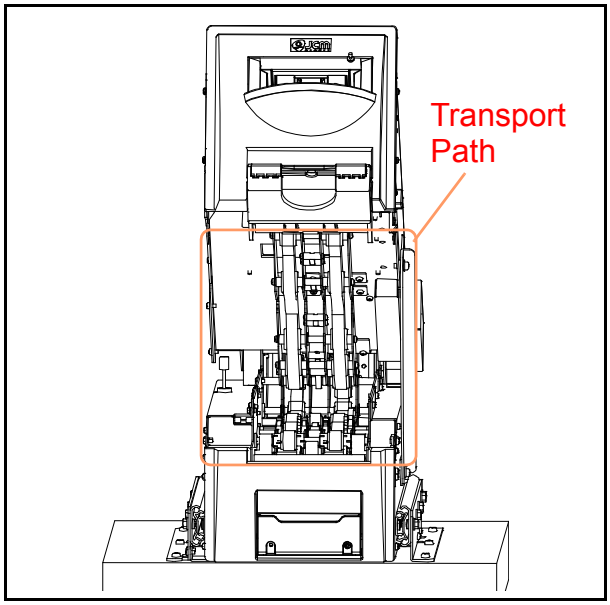


Figure 28 Upper and Lower Transport Assembly

RJ Assembly/Cash Box Transport Assembly Banknote Jam

Perform the following steps to clear a Banknote Jam within the RJ Assembly and the Cash Box Transport Assembly:

1. Pull the Latch Handle of the RDM-100.

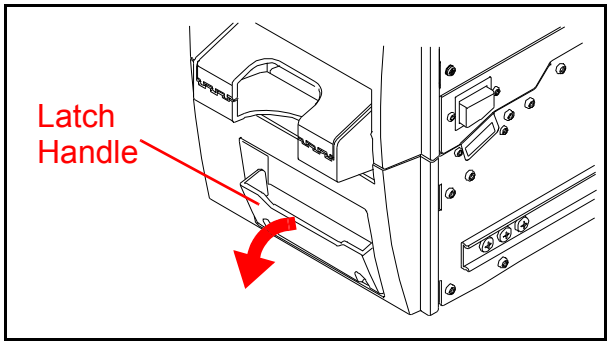


Figure 29 RDM-100 Unit Withdraw 1

2. Slide the RDM-100 forward.

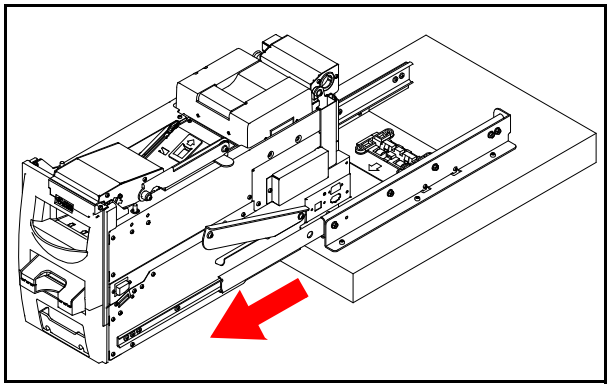


Figure 30 RDM-100 Unit Withdraw 2

3. If a Banknote jam is detected in the Cash Box Transport Assembly located on the bottom side of the RDM-100, remove the jammed Banknote. If the jammed Banknote is found within the Course area, rotate the Gear toward the Guide Frame arrow indicates.

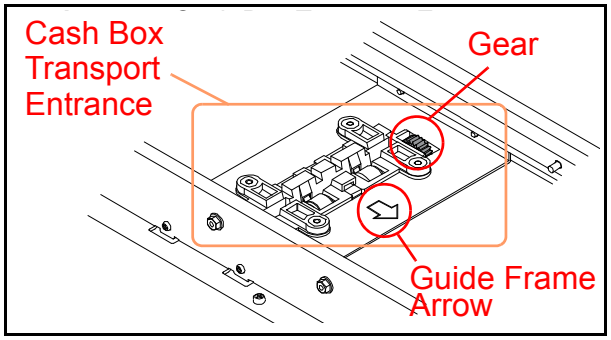
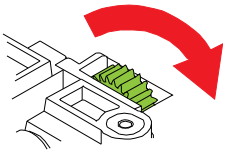


Figure 31 Cash Box Transport Entrance Area

Caution: The Gear must be rotated toward the Guide Frame Arrow (Insertion slot) direction. A Banknote would go into the Cash Box if the gear is rotated in the opposite direction.



4. Open the Course Cover upward while pressing the Latch Lever in direction indicated by the engraved arrow.

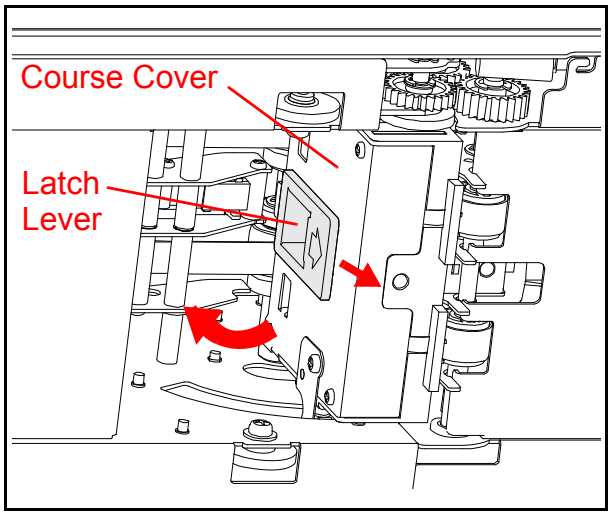


Figure 32 Course Cover Open 1

5. If a jammed Banknote is detected in the Transport Path, remove the Banknote.

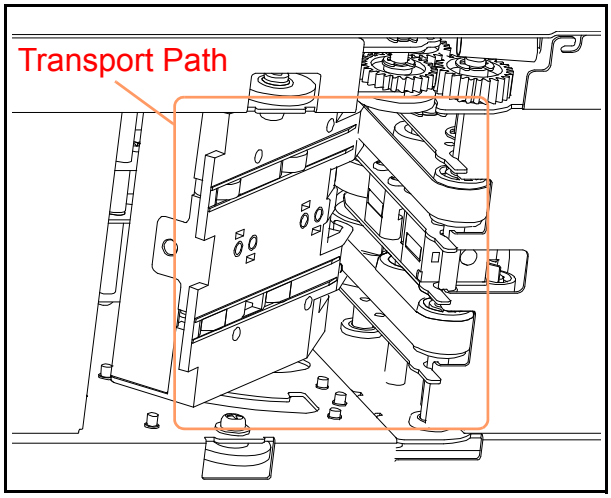


Figure 33 Course Cover Open 2

Cleaning Procedure

To clean the Transport Path, gently rub the Sensors and Rollers clean using a dry, soft, lint-free, Micro-fiber Cloth ONLY.
Do not use any Alcohol, solvents, Citrus based products or scouring agents that may cause damage to the Sensors and/or Rollers.

Sensor and Roller Cleaning Procedure

To clean the RDM-100 Unit's Sensors and Rollers, proceed as follows:

1. Turn the power **OFF** on both RDM-100 and the Host Machine.
2. Open the RDM-100 Unit and each Assembly within the RDM-100 Unit.
3. Clean the appropriate path and Lens of each Sensor and Roller.

Caution: Do not use Alcohol, thinner or Citrus based products for cleaning any Banknote transport Sensors or surfaces. The lenses can become clouded by chemical evaporation residue that may cause acceptance errors.

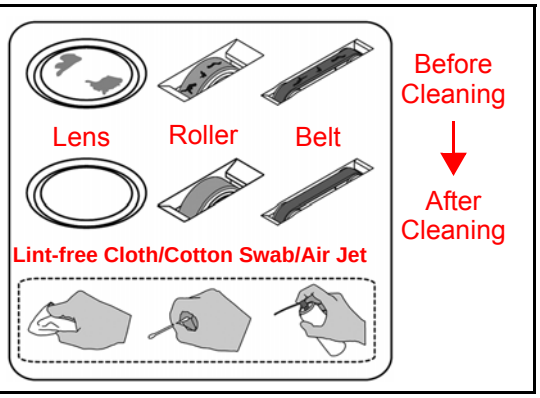


Figure 34 General Cleaning Image

SENSOR LOCATIONS

Figure 35 illustrates the various RDM-100 Unit's sensor locations. Table 9 lists the RDM-100 sensor type cleaning methods.

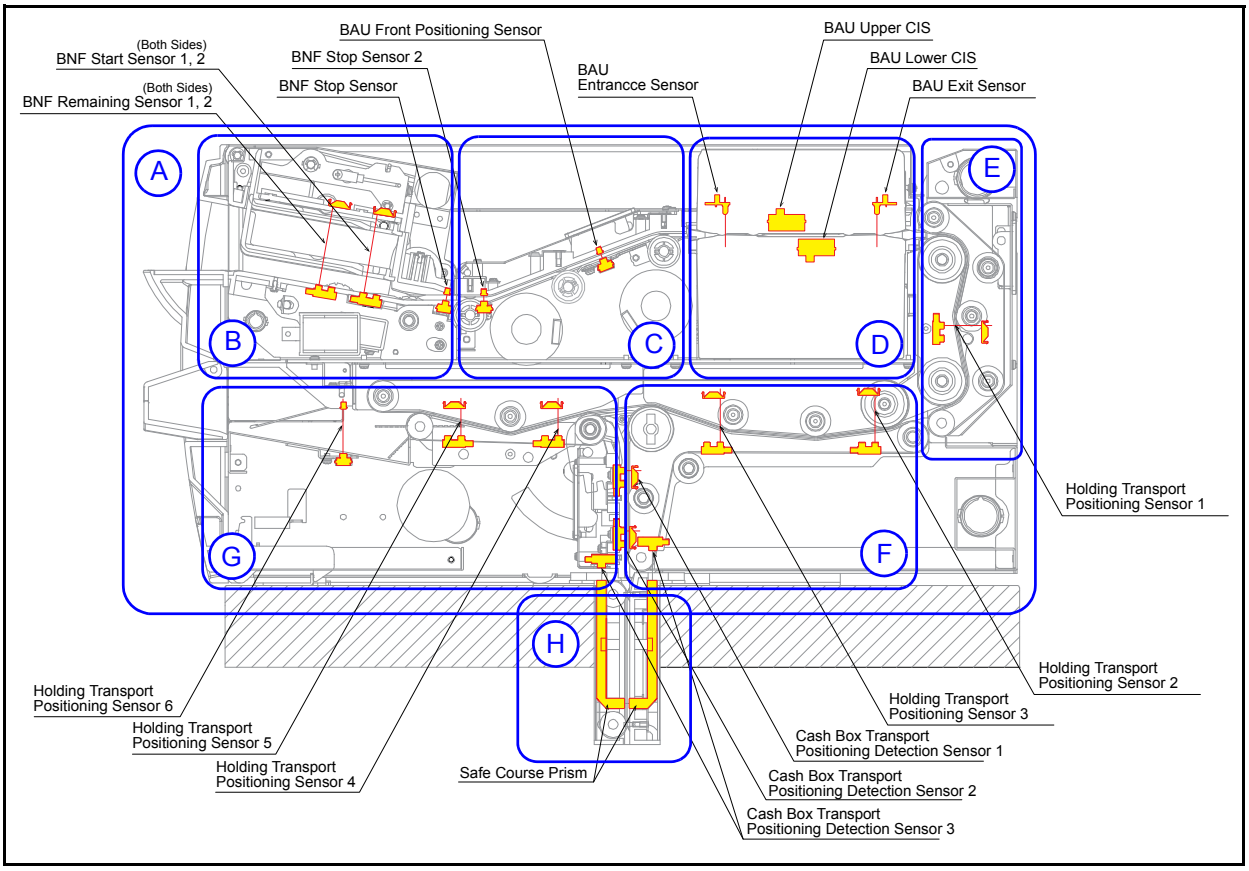


Figure 35 RDM-100 Sensor Locations

Table 9 RDM-100 Sensor Type Cleaning Methods

Area		Part	Sensor Type	Cleaning Method
A Unit	B	BNF Assembly	BNF Remaining Sensor 1, 2 (Both Sides)	Wipe clean using a soft lint-free cloth or blow clean using a non-flammable compressed air
			BNF Start Sensor 1, 2 (Both Sides)	
			BNF Stop Sensor	
	C	Transport Assembly	BNF Stop Sensor 2	
			BAU Front Positioning Sensor	
	D	BAU Assembly	BAU Entrance Sensor	
			BAU Upper CIS	
			BAU Lower CIS	
			BAU Exit Sensor	
	E	Holding Transport Rear Assembly	Holding Transport Positioning Sensor 1	
	F	Holding Transport Front Assembly	Holding Transport Positioning Sensor 2	
			Holding Transport Positioning Sensor 3	
	G	RJ Assembly	Holding Transport Positioning Sensor 4	
			Holding Transport Positioning Sensor 5	
			Holding Transport Positioning Sensor 6	
			Cash Box Transport Positioning Detection Sensor 1	
			Cash Box Transport Positioning Detection Sensor 2	
	H	Cash Box Transport Assembly	Cash Box Transport Positioning Detection Sensor 3	

Sensor Cleaning

Each Sensor, Roller and Belt cleaning is performed by opening each Unit Transport Path. Identify each sensor location while referring to the RDM-100 Sensor locations (Figure 35) and wipe the Sensors indicated by the Yellow Color using dry lint-free micro-fiber cloth and clean the Rollers and Belts indicated by a Green and a Brown Color using a slightly damp (not wet) lint-free Micro-fiber cloth.

- Sensors (Yellow Color)
- Rollers (Green Color)
- Belts (Brown Color)

NOTE: To open each Unit's Transport Path, refer to the "Clearing a Banknote Jam" on page 12.

BNF Assembly Cleaning

BNF Remaining Sensor/Start Sensor Cleaning

Open the BNF Top Cover, and clean the BNF Sensors and Rollers.

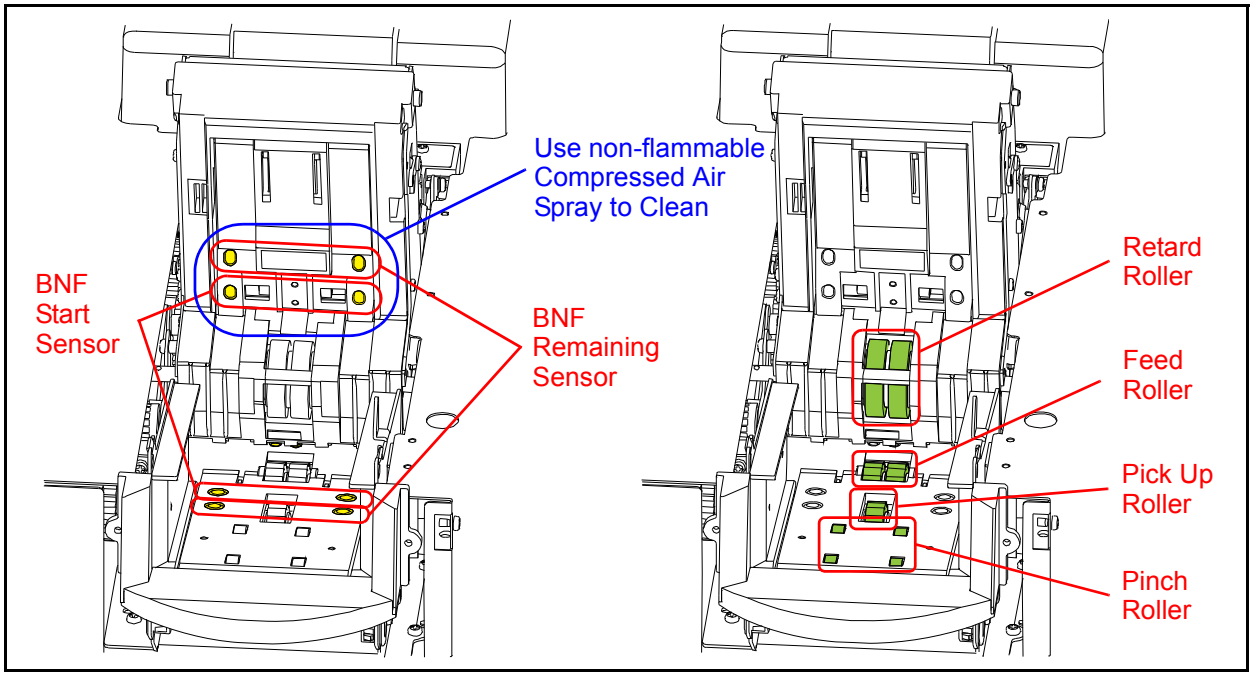


Figure 36 BNF Assembly Sensor/Roller Cleaning Locations

The non-flammable Compressed Air Spray must be used for the Upper BNF Start Sensor and the Upper BNF Remaining Sensor ONLY.

BNF Stop Sensor 1, 2 Cleaning

Perform the following steps to clean the BNF Stop Sensor 1, BNF Stop Sensor 2 and Rollers

1. Open the Transport Assembly Top Cover.
2. Lift the Transport Assembly Top Cover upward to remove it.

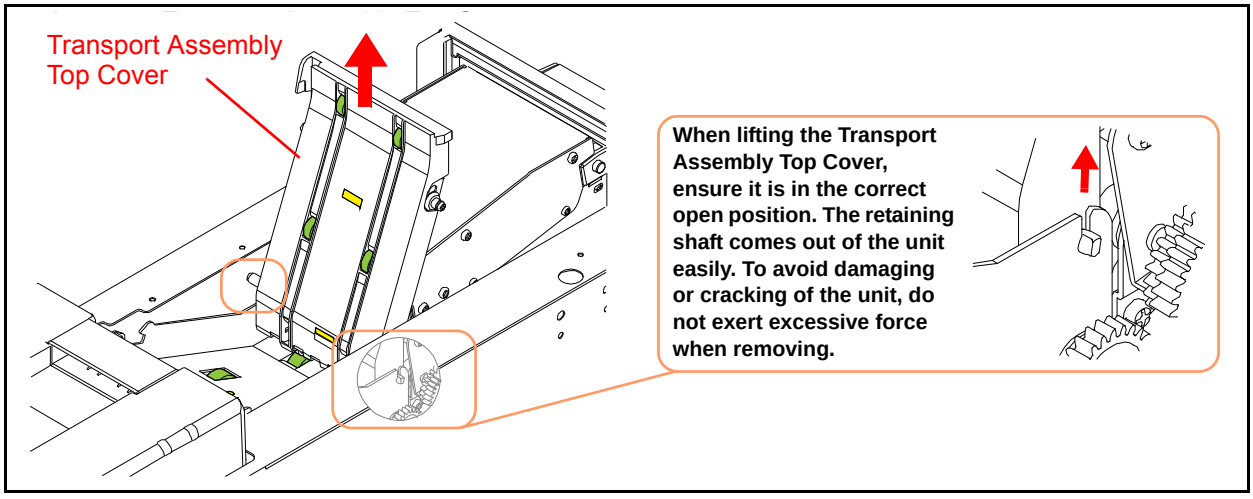


Figure 37 Transport Assembly Top Cover Removal

3. Open the BNF Top Cover until each BNF Stop Sensor is visible, and clean the Sensors and Rollers.

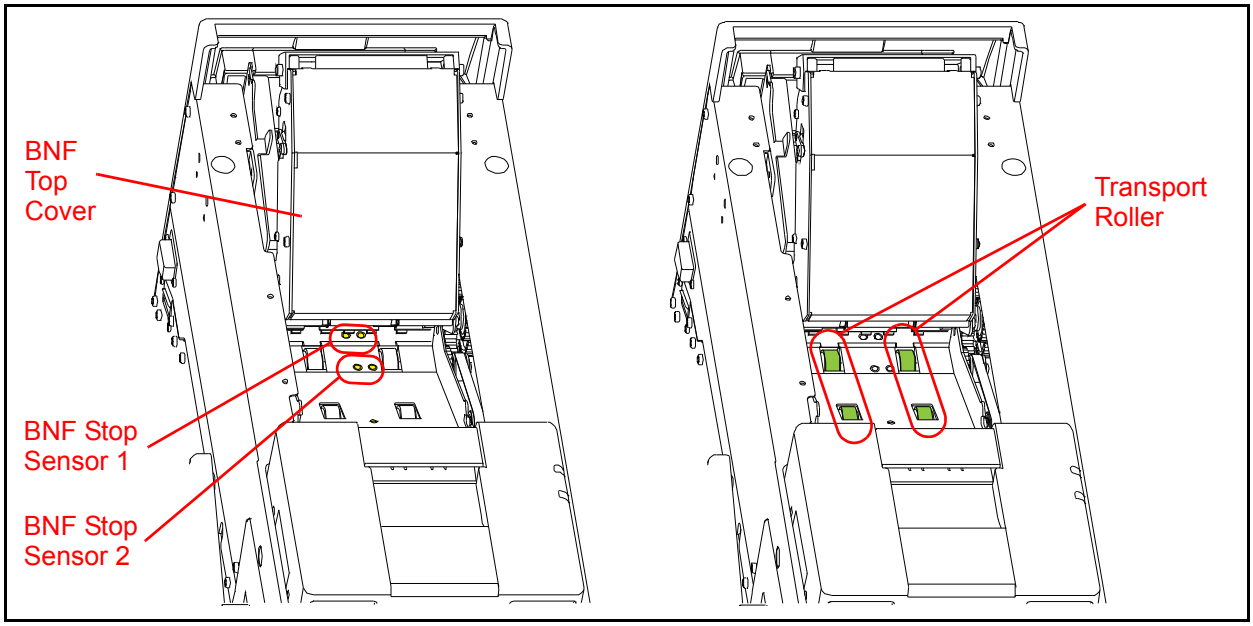


Figure 38 BNF Stop Sensors and Transport Rollers Location

Transport Assembly Top Cover Installation

When installing the Transport Assembly Top Cover, the shaft will slide into the cutout easily without excessive force.

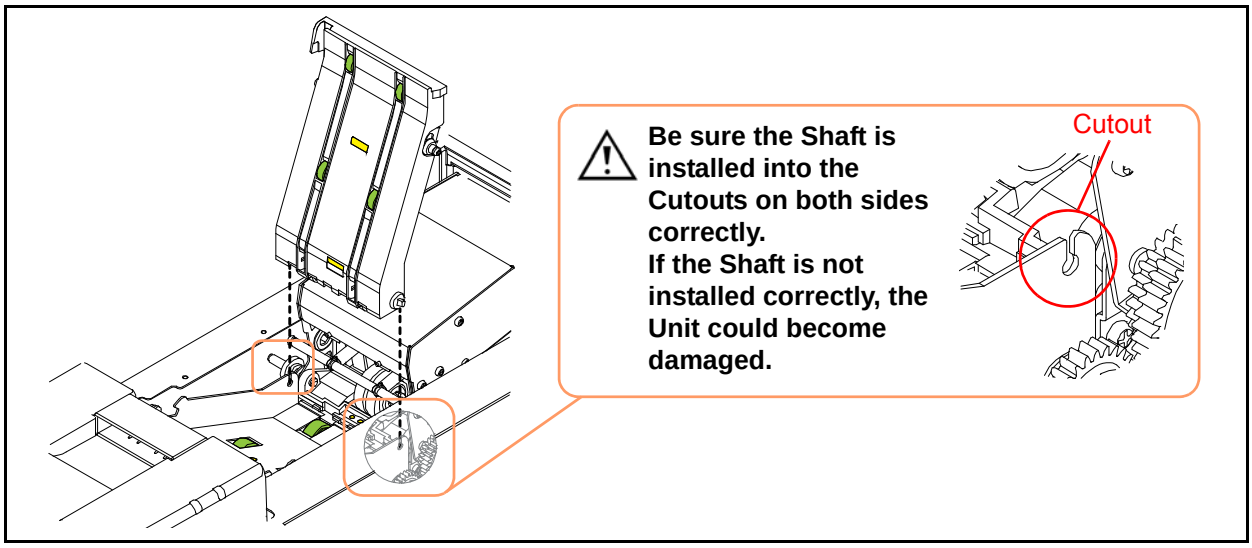


Figure 39 Cutout Location

TRANSPORT ASSEMBLY CLEANING

Open the Transport Assembly Cover and clean each Sensor and Roller on the Transport Path.

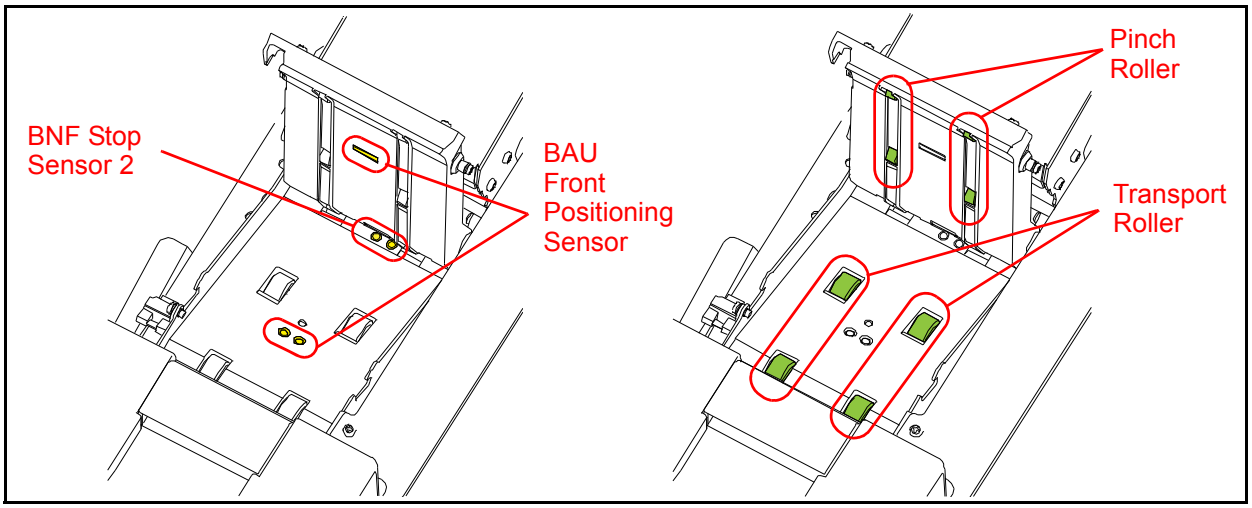


Figure 40 Transport Assembly Sensor/Roller Locations

Caution: When cleaning is performed by removing the Transport Assembly Top Cover, take care not to damage the Unit. Refer to "BNF Stop Sensor 1, 2 Cleaning" on page 19.

BAU Assembly Cleaning

Open the BAU Upper Chassis, and clean each Sensor, Roller and Belt.

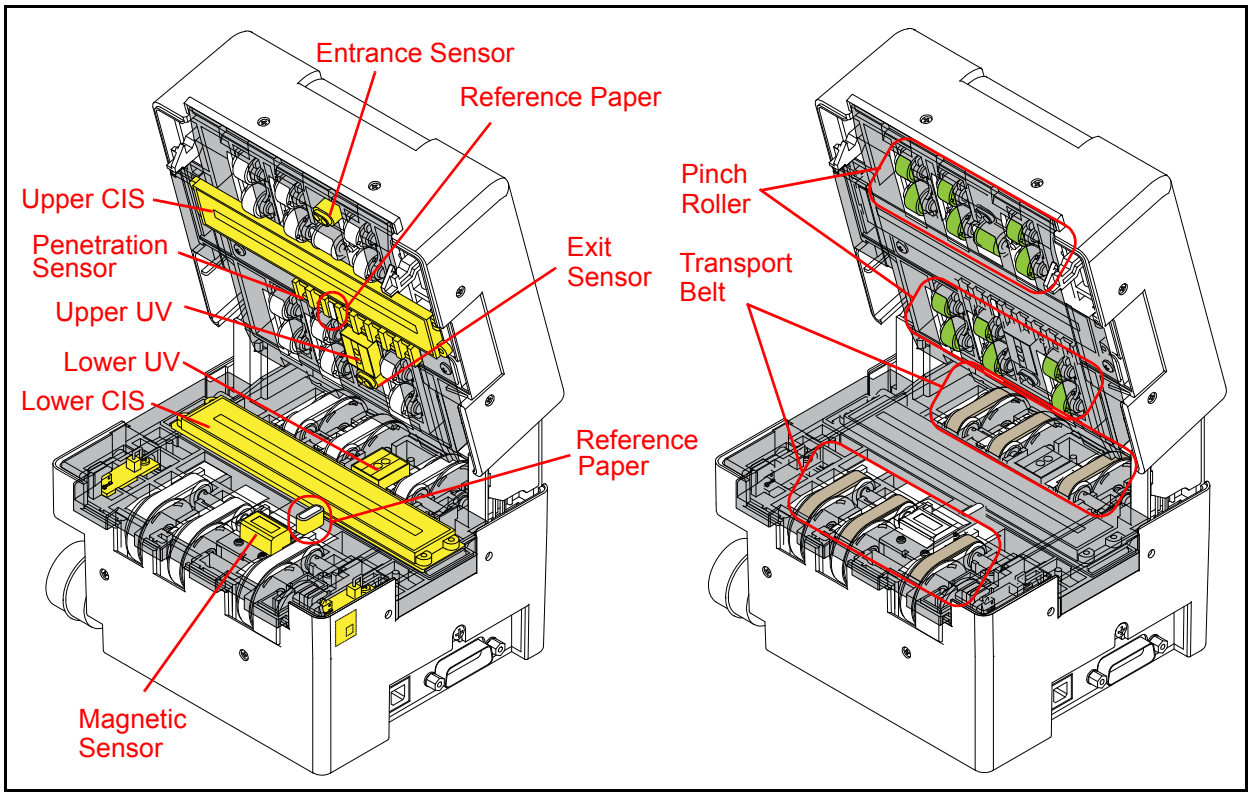


Figure 41 BAU Assembly Sensor/Roller/Belt Locations

NOTE: Refer to the BAU Maintenance and Operation Manual for more details.

Holding Transport Rear Assembly Cleaning

Open the Holding Transport Rear Cover and clean each Sensor and Belt.

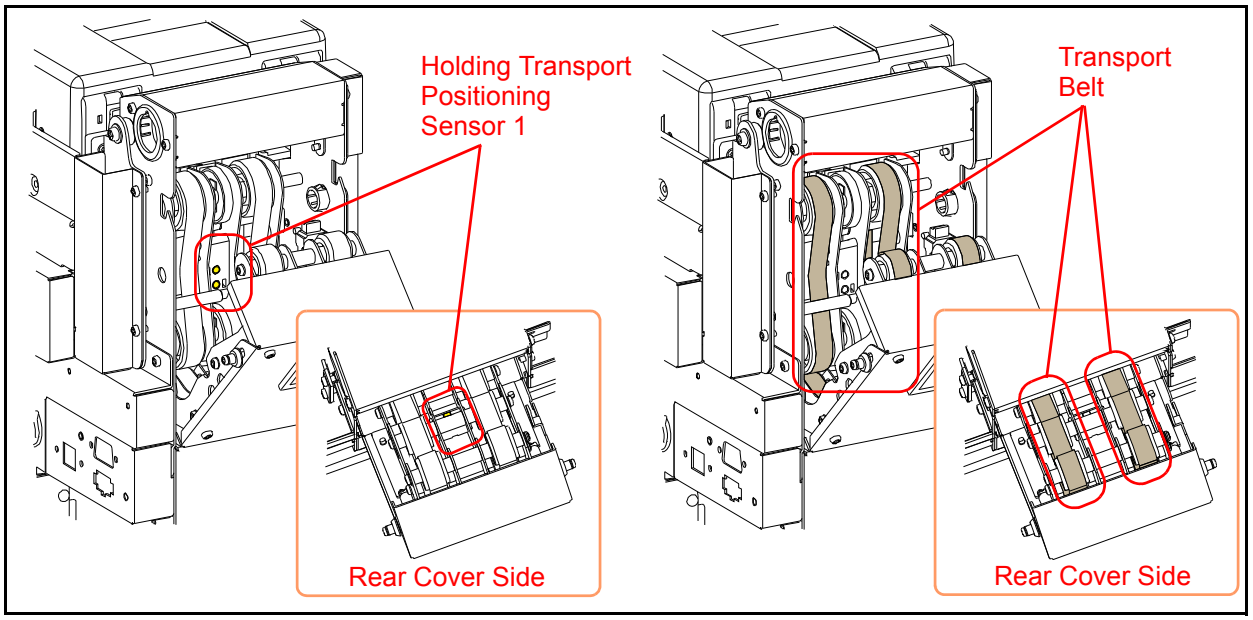


Figure 42 Holding Transport Rear Assembly Sensor/Belt Locations

HOLDING TRANSPORT ASSEMBLY CLEANING

Open the Upper Transport Assembly and clean Upper and Lower Sensors and Rollers.

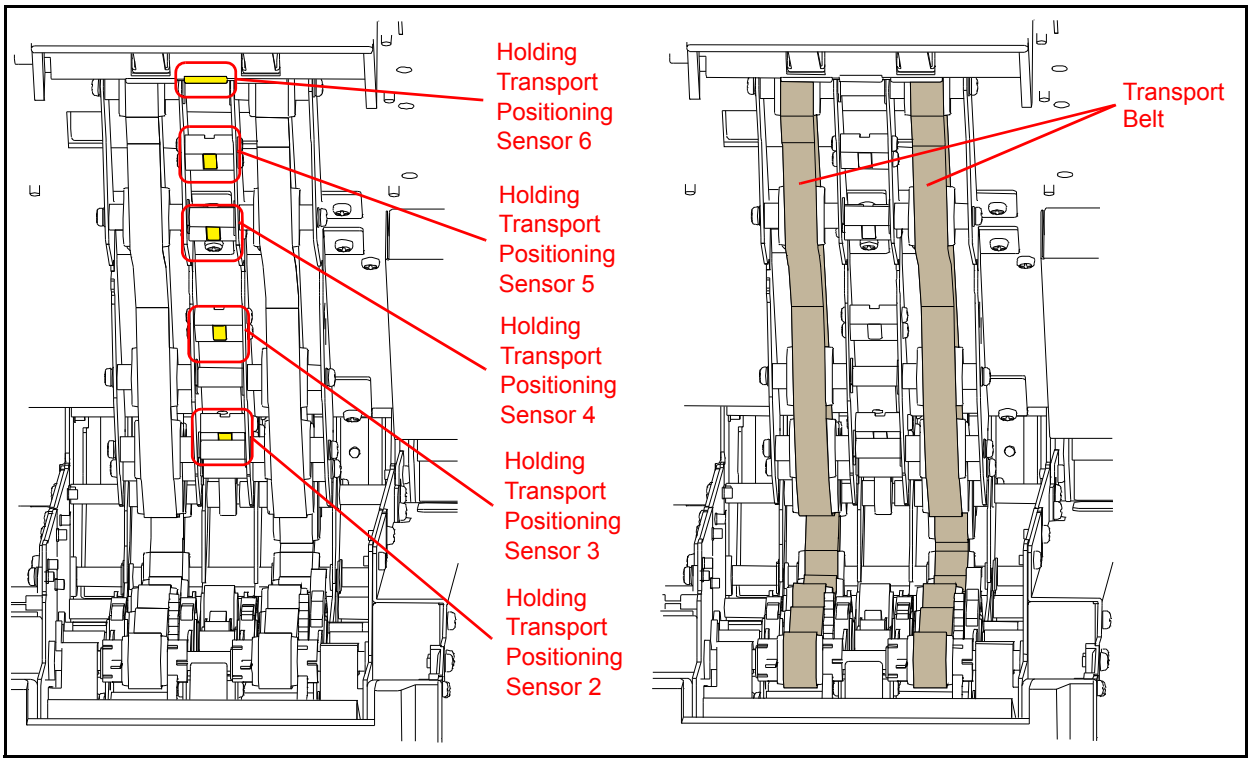


Figure 43 Holding Transport Assembly (Upper) Sensor/Belt Locations

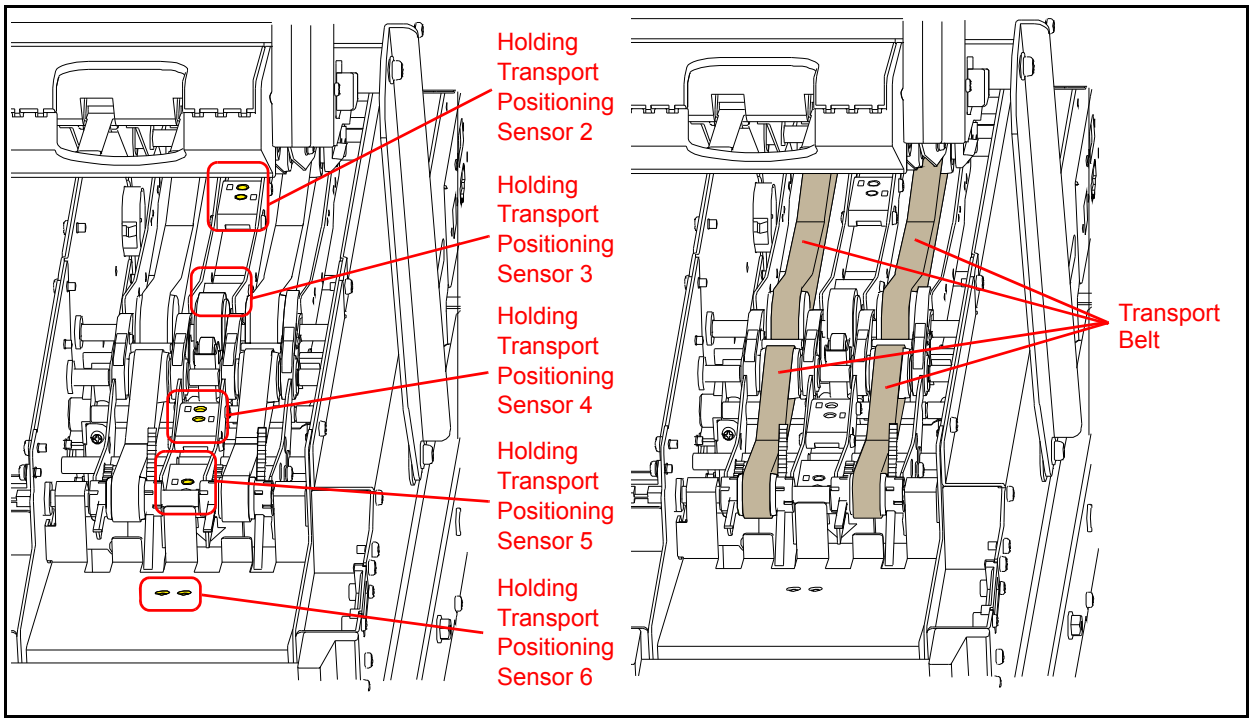


Figure 44 Holding Transport Assembly (Lower) Sensor/Belt Locations

Caution: After cleaning each Belt, be sure that the Belts has not come off of the Pulleys and the Belt is positioned correctly before closing the Unit.

RJ ASSEMBLY/CASH BOX TRANSPORT ASSEMBLY CLEANING

Slide the RDM-100 Unit forward and clean the Cash Box Transport entrance area.

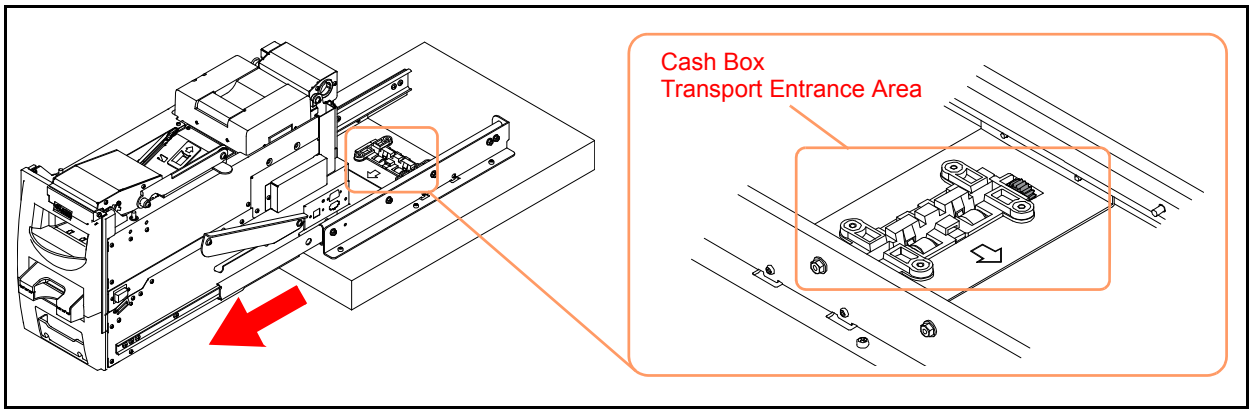


Figure 45 Cash Box Transport Entrance Location

Open the Holding Transport Rear Cover and clean each Sensor and Roller.

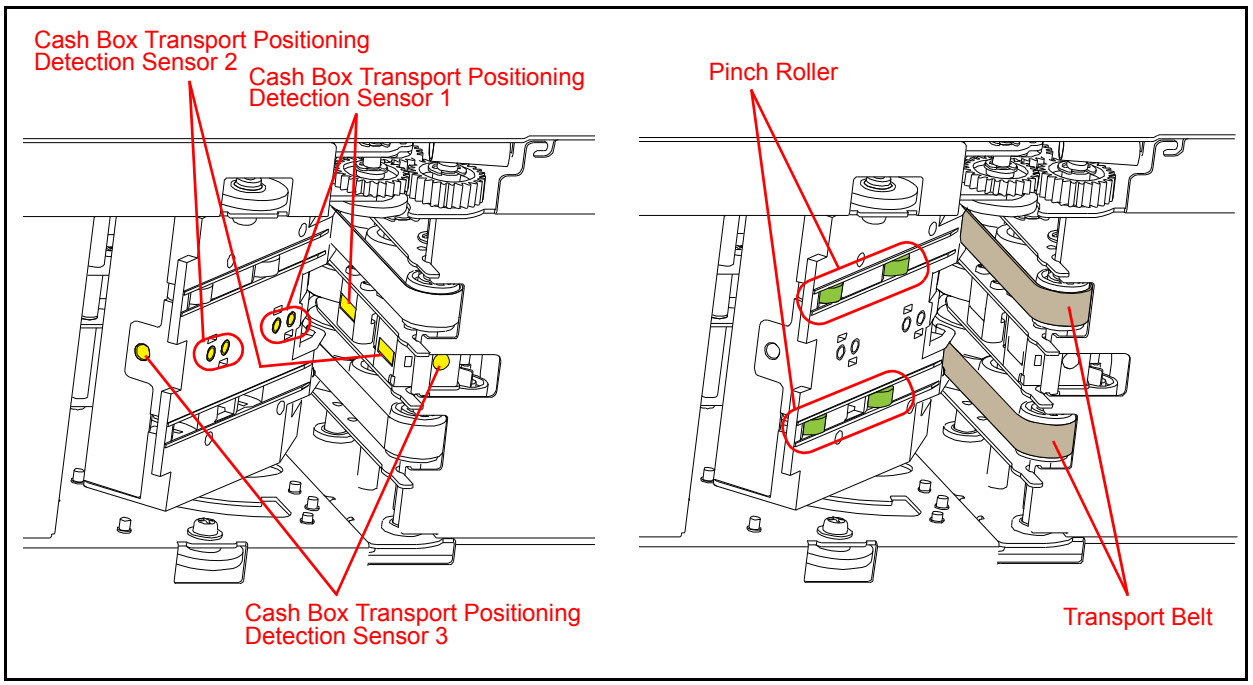


Figure 46 Cash Box Transport Assembly Sensor/Belt Locations

6 STANDARD INTERFACE CIRCUIT SCHEMATICS

HOST COMMUNICATION INTERFACE SCHEMATICS

Figure 47 illustrates the RDM-100 Host Communication Interface Schematic Diagram.

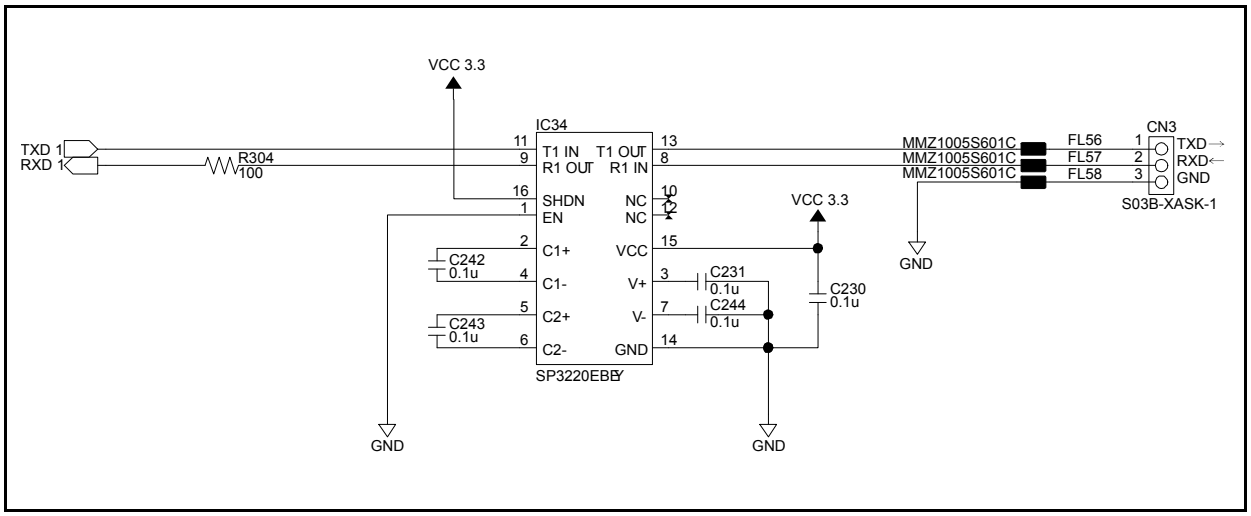


Figure 47 RDM-100 Host Communication Interface

USB COMMUNICATION INTERFACE SCHEMATICS

Figure 48 illustrates the RDM-100 USB Communication Interface Schematic Diagram.

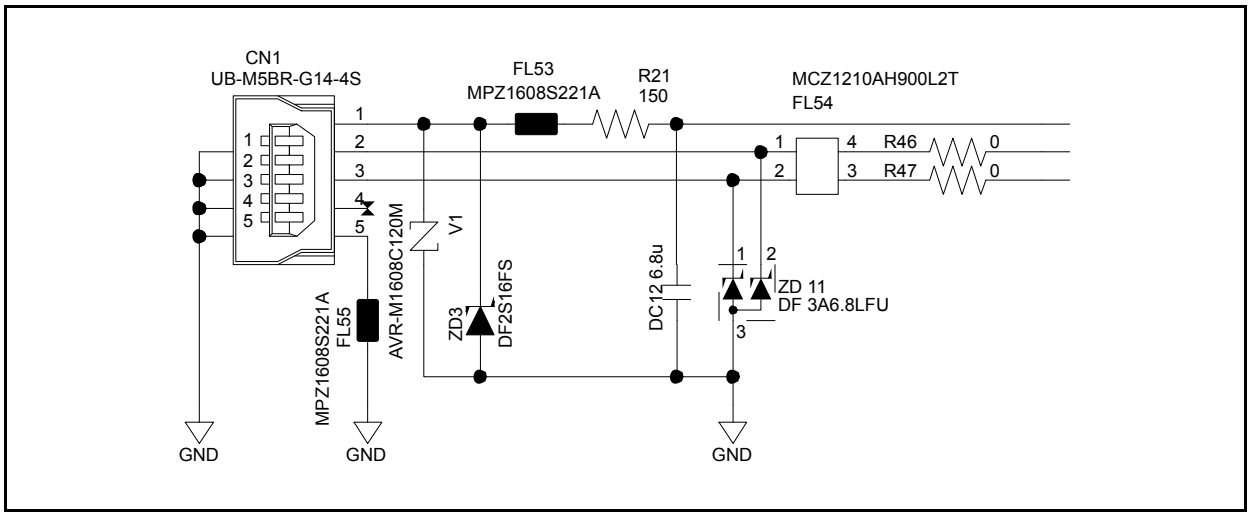


Figure 48 RDM-100 USB Communication Interface

BAU COMMUNICATION INTERFACE SCHEMATICS

Figure 49 illustrates the RDM-100 BAU Communication Interface Schematic Diagram.

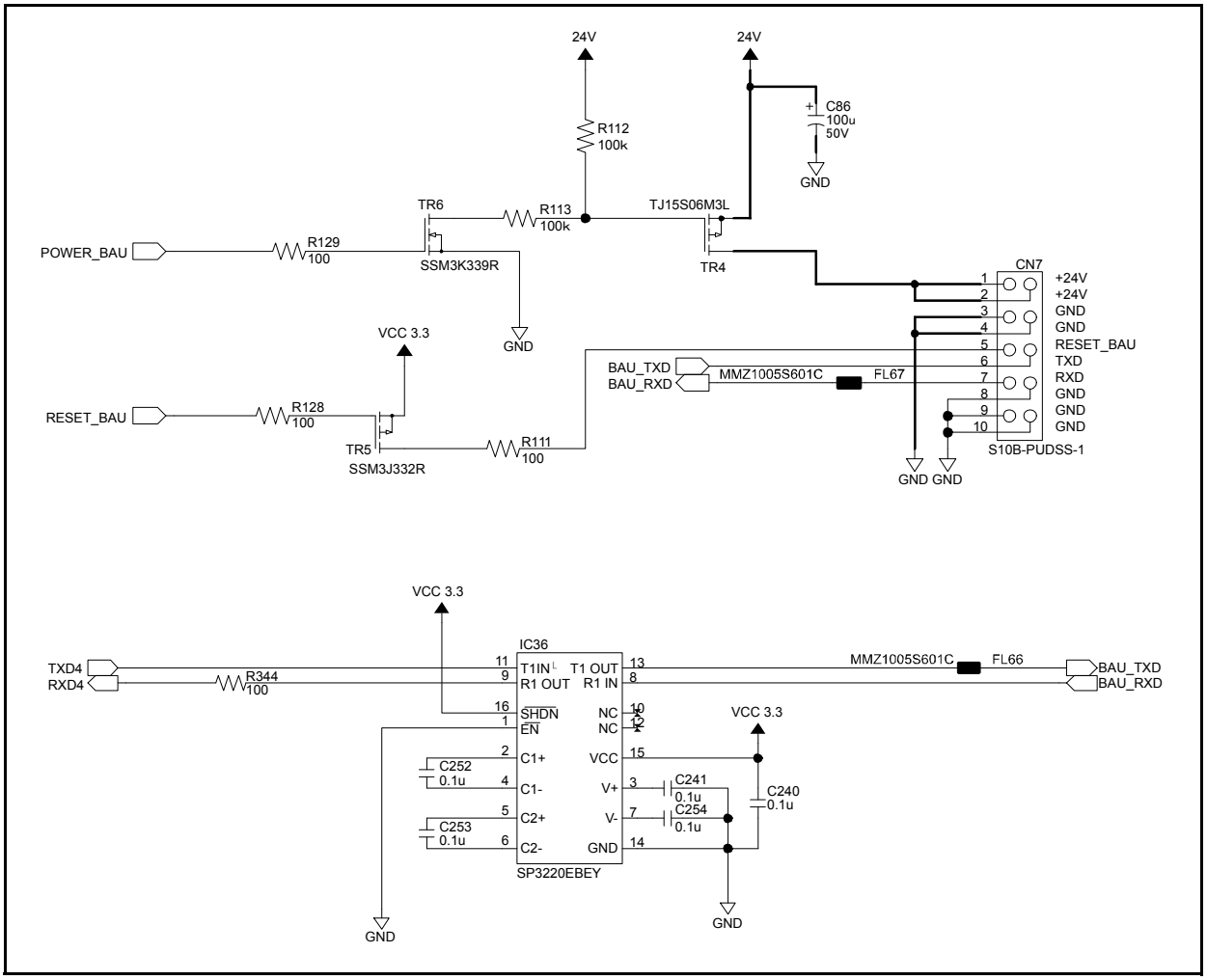


Figure 49 RDM-100 BAU Communication Interface

7 OPERATIONAL FLOWCHART

Figure 50 illustrates the RDM-100 Power ON Status Operation Flowchart.

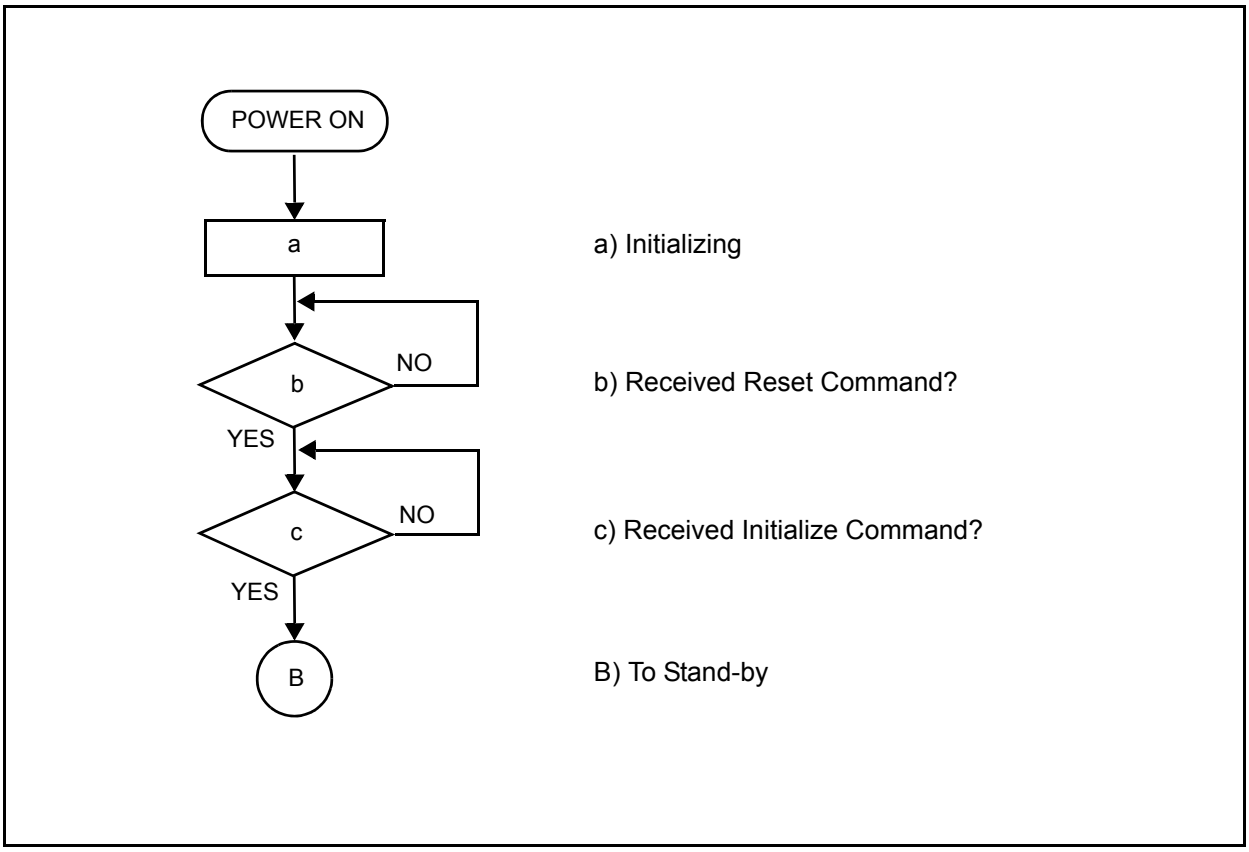


Figure 50 RDM-100 Power ON Status Operational Flowchart

Operational Flowchart (Continued 1)

Figure 51 illustrates the RDM-100 Stand-by Status Operation Flowchart.

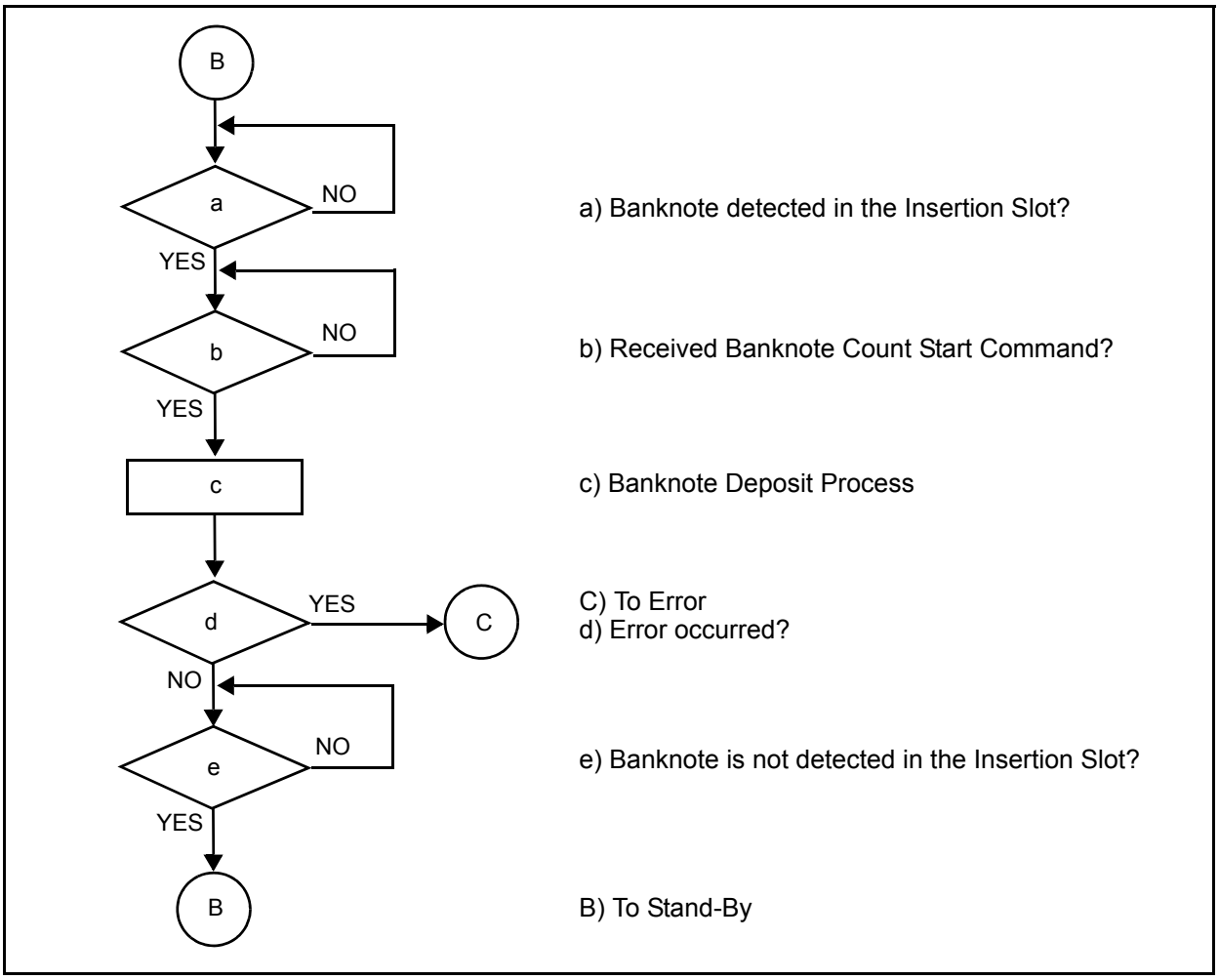


Figure 51 RDM-100 Stand-by Status Operational Flowchart

Figure 52 illustrates the RDM-100 Error Status Operation Flowchart.

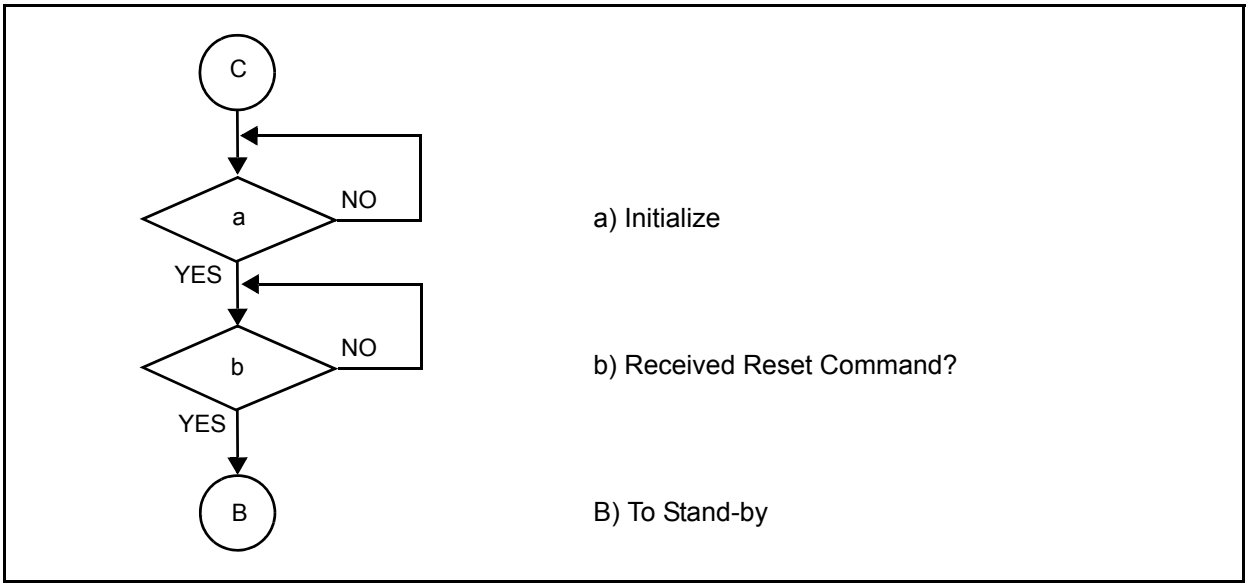


Figure 52 RDM-100 Error Status Operational Flowchart

8 TROUBLESHOOTING

This section provides troubleshooting instructions for the RDM-100 Banknote Validator Units, including the following information:

- Introduction
- Troubleshooting Overview
- Fault Table Listings

Introduction

Most Banknote Validator failures result from minor causes. Before replacing any parts, be sure that all assembly and circuit board connectors are properly fitted with their harnesses properly connected.

Poor performance by the RDM-100 Banknote Validator is often caused when dust or foreign objects adhere to the sensors or rollers. Clean the Banknote validation section first, then carefully observe the operating state of the Validator when re-initializing power. This observation is important in locating any causes of failure and the possible fault location.

Perform all repairs by referring to Calibration and Testing in Section 6 of the RDM-100 Operation and Maintenance Manual, and the Disassembly/Reassembly instructions in Section 4 of the RDM-100 Operation and Maintenance Manual.

Troubleshooting Overview

This product allows the operator to perform fault diagnosis by checking various Fault Table Listings against the symptoms. Survey the cause(s) of any failure occurrences during the process.

After determining the cause of the failure, execute the Performance Test, and then repair the unit replacing any appropriate parts deemed necessary.

Fault Table Listings

Table 10 lists the various possible RDM-100 Unit fault conditions that can occur and the necessary actions required to correct them.

Table 10 General Fault Conditions

Error Codes		Part	Description	Remarks
11	93	**EEPROM**	Sensor Calibration Error	
	94		Production Number Error	
	95		Software Switch Data Error	
	97		Read Error	
	98		Write Error	
	99		Data Error	
12	91	**RTC**	RTC Error	
13	90	**SRAM**	Backup Error	
14	62	**Flash Memory**	Flash Memory Erase Error	
	64		Flash Memory Program Error	
	65		Erase Verify Error	
	66		Address Error	
30	**	**BAU**	BAU Relative Error	Refer to BAU Operation and Maintenance Manual
	71		Communication Error	
	72		Accept Notice Full	
	A3		Remaining Note Detection After Initializing	
	B4		Latch Set Error During Initializing	
50	A2	**BNF Start Sensor 1R (S01R)**	Sensor ON During Initializing	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	F1		No Banknote Before Counting Starts	**Warning Code***
51	A2	**BNF Start Sensor 1R (S01L)**	Sensor ON During Initializing	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	F1		No Banknote before counting starts	**Warning Code***
52	A2	**BNF Remaining Sensor 1 (S02)**	Sensor ON During Initializing	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	F1		No Banknote before counting starts	**Warning Code***

Table 10 General Fault Conditions (Continued)

Error Codes		Part	Description	Remarks
53	A1	BNF Stop Sensor 1 (S03)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
	EA		Banknote Reset Requirement	**Warning Code***
54	A1	BNF Stop Sensor 2 (S04)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
	EA		Banknote Reset Requirement	**Warning Code***
57	A1	BAU Front Positioning Sensor 1 (S07)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
59	A1	Holding Transport Positioning Sensor 1 (S09)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
5A	A2	BNF Remaining Sensor 2 (S10)	Sensor ON when Initial Movement starts	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	F1		No Banknote at Insertion Slot before counting	**Warning Code***

Table 10 General Fault Conditions (Continued)

Error Codes		Part	Description	Remarks
5B	A1	Holding Transport Positioning Sensor 2 (S11)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
5C	A1	Holding Transport Positioning Sensor 3 (S12)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
5D	A1	Holding Transport Positioning Sensor 4 (S13)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
5E	A1	Holding Transport Positioning Sensor 5 (S14)	Sensor ON before Initial Movement starts	
	A2		Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
5F	81	Holding Transport Positioning Sensor 6 (S15)	Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	

Table 10 General Fault Conditions (Continued)

Error Codes		Part	Description	Remarks
60	A2	Cash Box Transport Positioning Sensor 1 (S16)	Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A7		Tracking Data Error	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	B0		Sensor ON while Initial Reverse Movement within the time range specified	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
58	A2	Cash Box Transport Positioning Sensor 2 (S8)	Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A7		Tracking Data Error	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	B0		Sensor ON while Initial Reverse Movement within the time range specified	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
61	A2	Cash Box Transport Positioning Sensor 3 (S17)	Sensor ON when Initial Movement starts	
	A3		Sensor ON when Initial Movement stops	
	A4		No Sensor ON within the time range specified	
	A5		Sensor ON (Never OFF)	
	A7		Tracking Data Error	
	A8		No Tracking Data	
	AA		Sensor ON when counting starts	
	AB		Sensor ON when counting stops	
	B0		Sensor ON while Initial Reverse Movement within the time range specified	
	81		Sensor Calibration Error - DA Value Low	
	82		Sensor Calibration Error - DA Value High	
	85		Sensor Offset Error - DA Value Low	
	86		Sensor Offset Error -DA Value High	
62	B1	Unit Set SW (S18)	Before Initializing	
	B3		Before Sensor Calibration	
	B4		Initializing	
	B5		Counting	
	F0		Before Counting	**Warning Code***
64	B1	BNF Open/Close Detection Sensor (S20)	Before Initializing	
	B3		Before Sensor Calibration	
	B4		Initializing	
	B5		Counting	
	F0		Before Counting	**Warning Code***
65	B1	Transport Open/Close Detection Sensor 1 (S21)	Before Initializing	
	B3		Before Sensor Calibration	
	B4		Initializing	
	B5		Counting	
	F0		Before Counting	**Warning Code***

Table 10 General Fault Conditions (Continued)

Error Codes		Part	Description	Remarks
66	B1	Transport Open/Close Detection Sensor 2 (S22)	Before Initializing	
	B3		Before Sensor Calibration	
	B4		Initializing	
	B5		Counting	
	F0		Before Counting	Warning Code*
67	B1	Transport Open/Close Detection Sensor 3 (S23)	Before Initializing	
	B3		Before Sensor Calibration	
	B4		Initializing	
	B5		Counting	
	F0		Before Counting	Warning Code*
68	B1	Transport Open/Close Detection Sensor 4 (S24)	Before Initializing	
	B3		Before Sensor Calibration	
	B4		Initializing	
	B5		Counting	
	F0		Before Counting	Warning Code*
70	40	BNF Drive (M1)	Lock Up	
71	40	BAU Transport (M2)	Lock Up	
72	40	Holding Transport (M3)	Lock Up	
73	62	Pusher Plate Drive (M4)	Pusher Plate upward movement error	
	63		Pusher Plate downward movement error	
74	60	Switch (SL1)	Receive Direction Movement Error	
	61		Reject Direction Movement Error	
E0	B0	Transport Path	Banknote Remaining after Initial Reverse Movement	
FF	FA	Communication	Communication Command Incorrect	Warning Code*
	FB		Parameter Error	Warning Code*
	FC		Execution Disable	Warning Code*
	FD		Communication Sequence Incorrect	Warning Code*

*. Not treated as an error, the Unit continues to operate.

9 UNIT DIMENSIONS

ENTIRE UNIT OUTSIDE DIMENSIONS

Figure 53 illustrates the RDM-100 Unit's Entire Outside Dimensions..

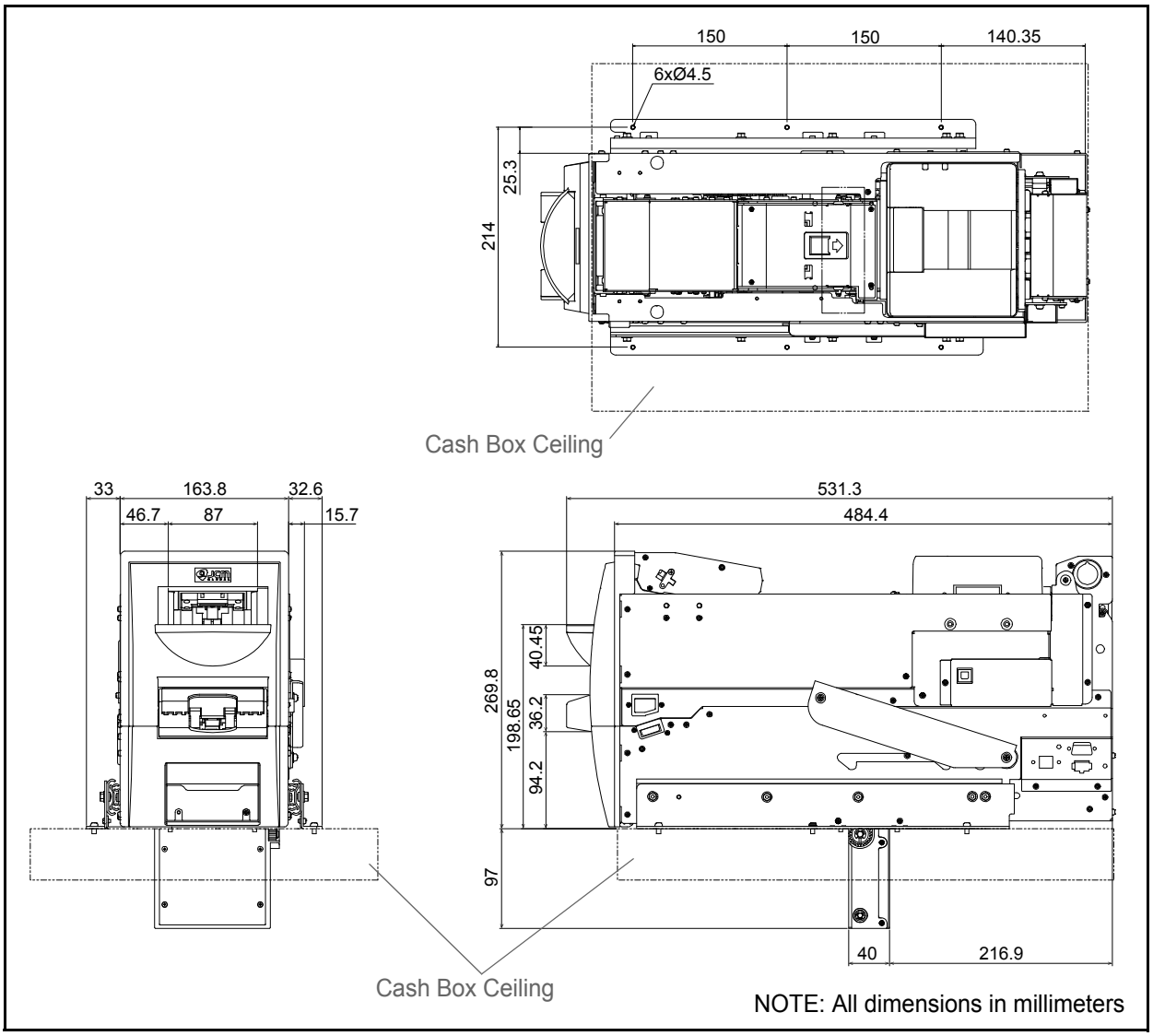


Figure 53 RDM-100 Unit Entire Outside Dimensions

ENTIRE UNIT WITH OPTIONAL TOP COVER OUTSIDE DIMENSIONS

Figure 54 illustrates the RDM-100 Unit with Optional Top Cover Entire Outside Dimensions.

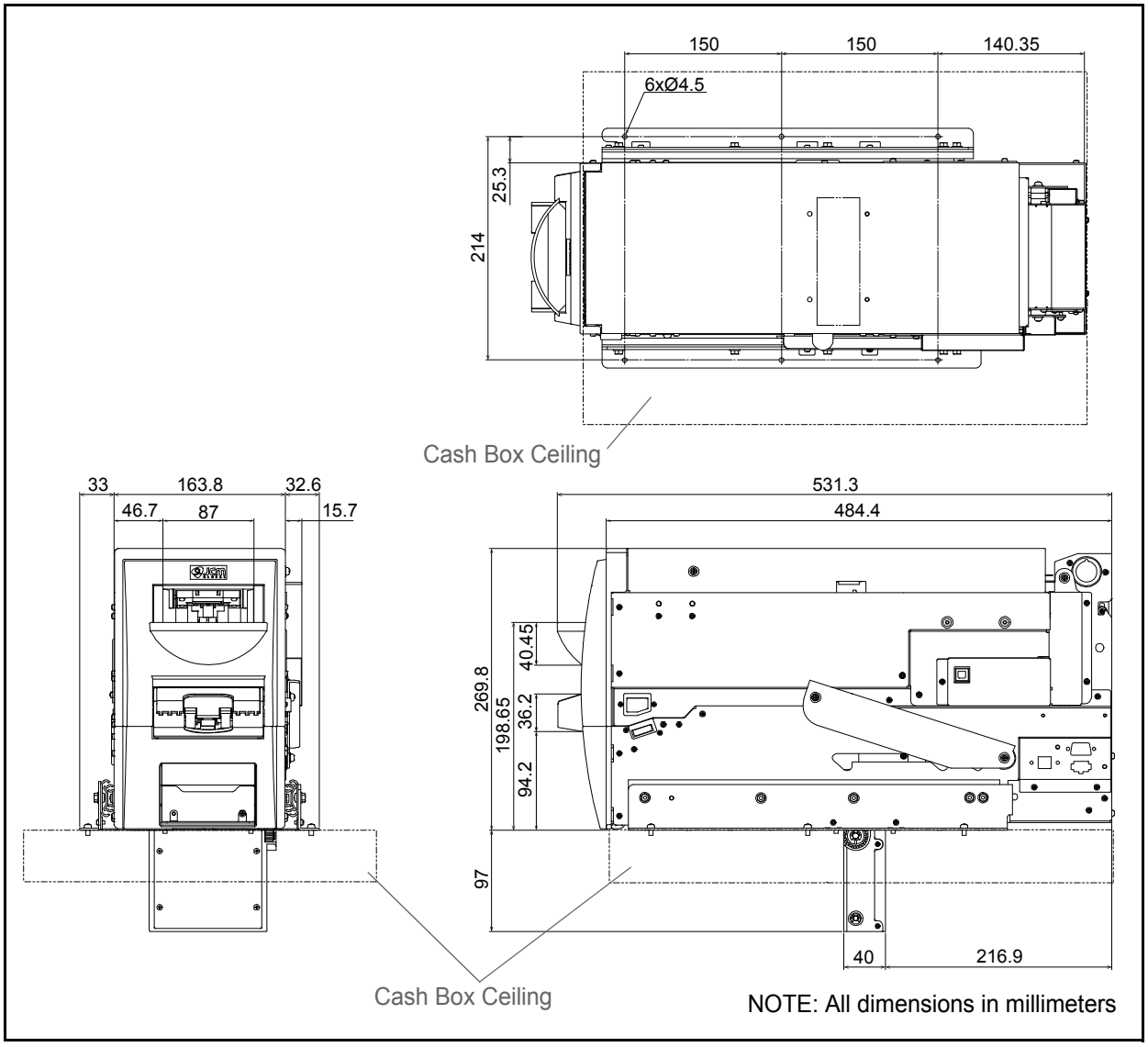


Figure 54 RDM-100 Unit with Optional Top Cover Entire Outside Dimensions

RDM-100 Installation/Maintenance Space Requirements

Figure 55 illustrates the RDM-100 Holding Transport Part installation and maintenance space requirement.

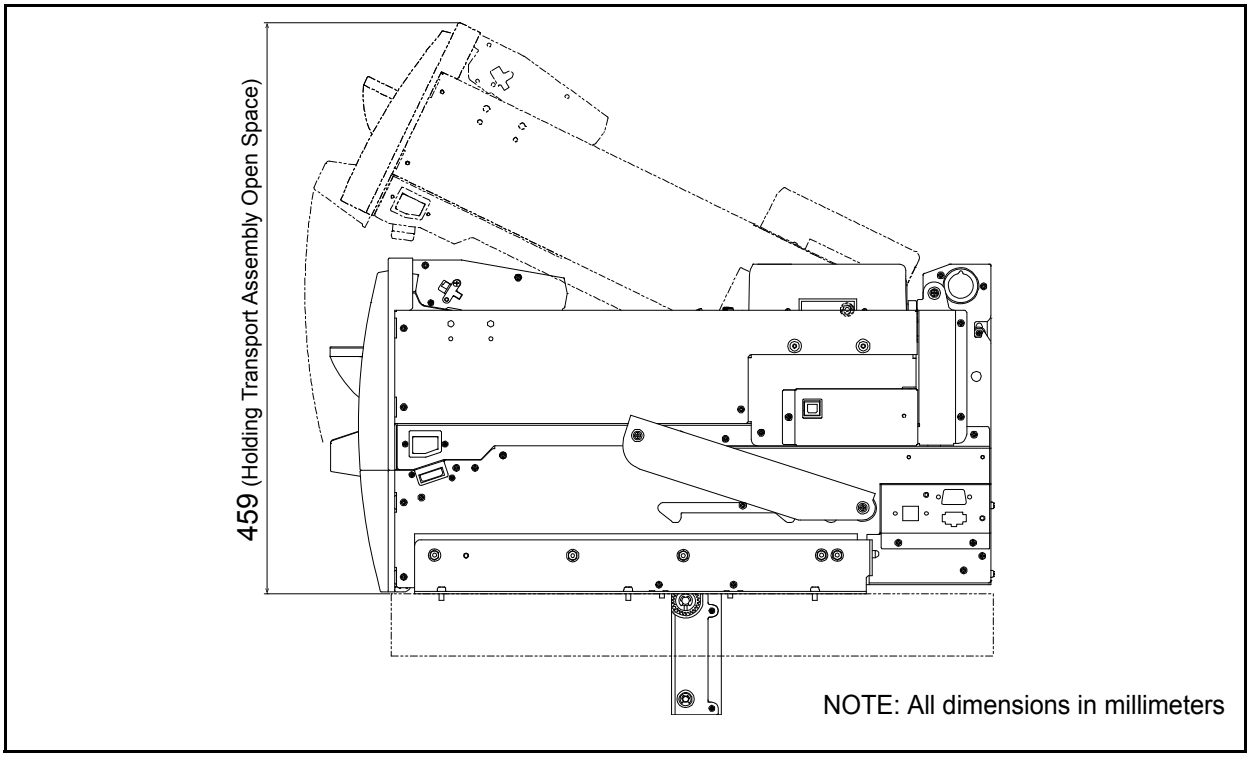


Figure 55 RDM-100 Installation and Maintenance Space Requirement

Figure 56 illustrates the RDM-100 with Optional Top Cover Holding Transport Part installation and maintenance space requirement.

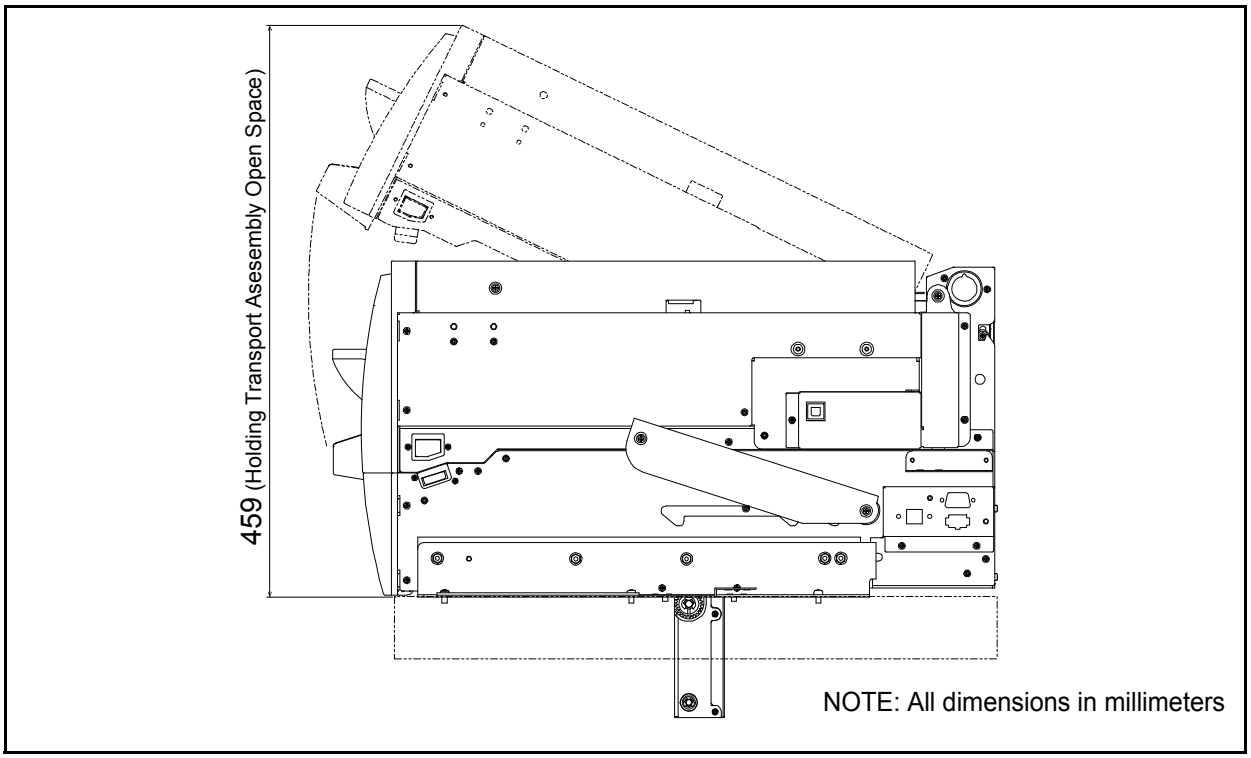


Figure 56 RDM-100 with Optional Top Cover Installation and Maintenance Space Requirement

Figure 57 illustrates the RDM-100 each Unit's installation and maintenance space requirement.

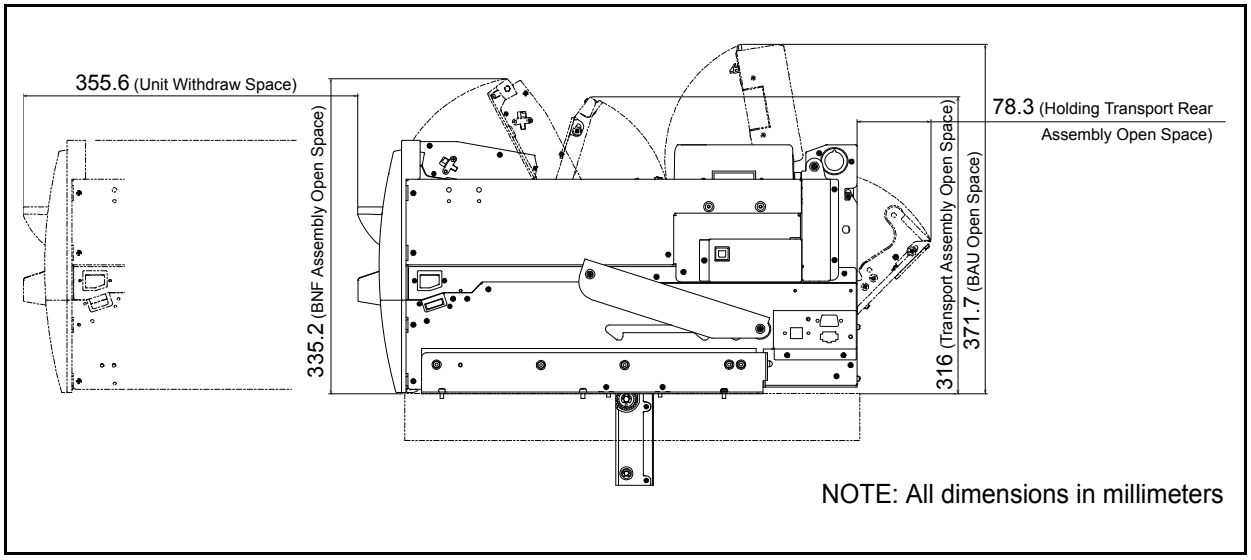


Figure 57 RDM-100 Each Unit Installation and Maintenance Space Requirement

Figure 58 illustrates the RDM-100 each Unit and Optional Top Cover installation and maintenance space requirement.

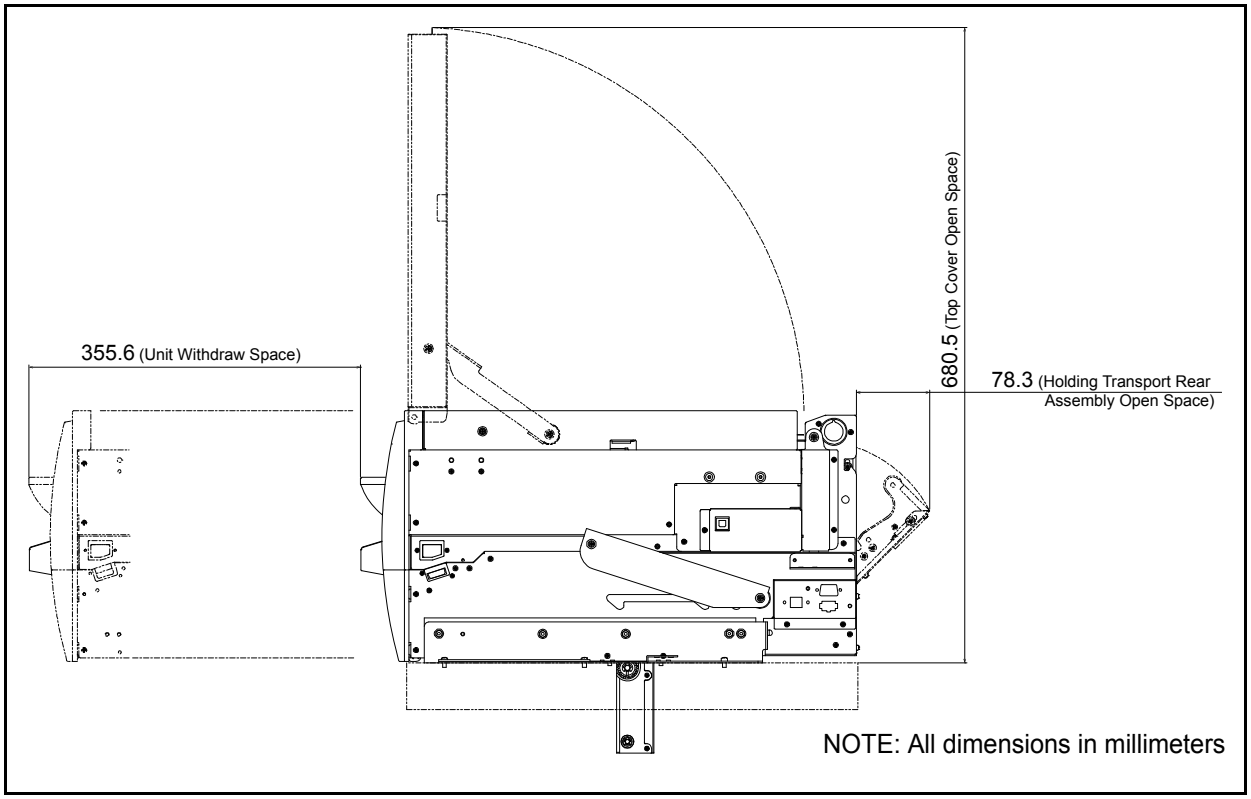


Figure 58 RDM-100 Each Unit and Optional Top Cover Installation and Maintenance Space Requirement

10 TECHNICAL CONTACT INFORMATION

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http://www.jcmglobal.com

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