JCM GLOBAL

DBV® Series
Banknote Validator (DBV-500)
Integration Guide
Revision A, March 17, 2014
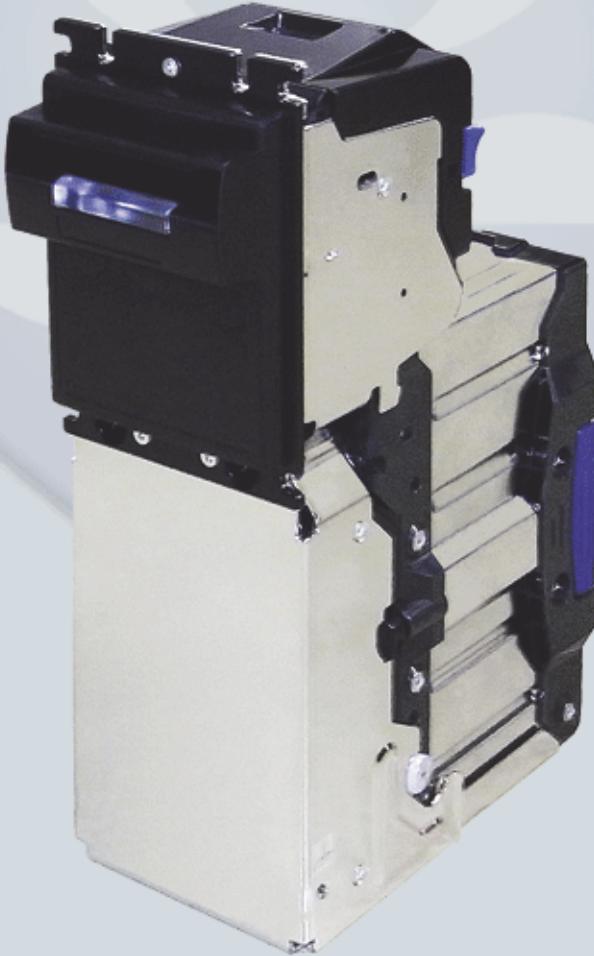
RoHS Compliant Product

REVISION HISTORY			
Rev №.	**Date**	**Reason for Update**	**Comment**
A	3-17-14	Initial Document	

International Compliance

- RoHS Directives or or or or
- UL & c-UL Marks
- CE Mark
- CB Scheme .

NOTE: The above listed compliance confirmations are currently being examined for approval or certification.

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DBV® Series
Banknote Validator (DBV-500)

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DBV® Series
Banknote Validator (DBV-500)
Integration Guide
Revision A

1 GENERAL INFORMATION

Description

This section provides a general overview of the DBV® Series Banknote Validator Unit (DBV-500), pictured in Figure 1. This section is designed to help the user navigate through this guide with ease. It includes the following information:

- DBV-500 Unit
- Model Descriptions
- Type Descriptions
- Software 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.).

DBV-500 Unit

Figure 1 DBV-500 Unit

Model Descriptions

Table 1 lists the product model number descriptions.

Table 1 DBV-500 Model Number Specifications

№	Model: <u>DBV - 5 * *</u> - (*) * * (/* *) № (1) (2)(3) (4) (5)
(1)	Model Name
(2)	Validation Sensor **0 = Type A (Standard World Wide)** **1 = Type B**
(3)	Transport Unit Type **0 = Standard (World Wide/Centering Type)**
(4)	Intake Part Unit (Optional) **None = Standard** **F = Auto Feeder Unit** **G = Shutter Unit**
(5)	Stacker Type* **SD = Downward Stacking (Standard)** **SU = Upward Stacking (Standard)**

*. When using the SD and the SU Types compatibly depends on the Bezel Type, the Stacker Type is indicated as "SD/SU".

Type Descriptions

Table 2 lists the product type number descriptions.

Table 2 DBV-500 Type Number Specifications

№	Model: * * * * * - * * * * * * - * * № (1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)
(1)	Cash Box Capacity* **0 = No Cash Box (Transport Unit Specification)** **S = 500 notes (New Banknote)** **M = 1000 notes (New Banknote)** **L = 1400 notes (New Banknote)**
(2)	Cash Box Door Lock **0 = No Lock** **1 = Free Access Lever** **2 = Key Lock without Key** **3 = Key Lock with Key**
(3)	Cash Box Handle **0 = No Handle (Standard)** **1 = Handle Type A**
(4)	Cash Box Frame Lock **0 = No Lock** **1 = Frame Lock without Key** **2 = Frame Lock with Key**
(5)	Cash Box Acceptable Banknote Length **0 = 120mm-160mm (Standard)** **1 = 120mm-170mm**

(6)	Bezel
	0 = Without Bezel
	1 = Bezel Type A
	   (SD/SU Compatible, CC Shape Bezel, Black, 78mm)
	2 = Bezel Type B
	   (SD/SU Compatible, CC Shape Bezel, Black, 71mm)
	3 = Bezel Type C
	   (SD Specification, JCM Bezel, Black, 78mm)

(7)	Sleep Mode **0 = No** **1 = Yes**
(8)	Memory **0 = 32M bit (Standard)** **1 = 64M bit**

Table 2 DBV-500 Type Number Specifications

№	Model: * * * * * - * * * * * * - * * № (1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)
(9)	Optional Board **0 = None (Standard)**
(10)	External Connection Harness **0 = None** **1 = Standard Harness** **2 = USB I/F Harness**
(11)	External Bracket **0 = None** **1 = Type A (CC Installation)**
(12)	Reserved
(13)	Reserved

*. The number of stacked Notes depends on the Banknote's condition.

Software Descriptions

Table 3 lists the product type number descriptions.

Table 3 DBV-500 Software Number Specifications

№	Software: <u>DBV-500-SD/SU</u> USA - * * * - <u>V</u> * .**-** № (A) (B) (C) (D)
(A)	Software Model Name
(B)	Denomination (Country Code)*
(C)	Interface Protocol Name
(D)	Software Version

*. The Country Code is indicated following the ISO 3166 standard.

Precautions

| Type 1 | Type 2 | Type 3 |
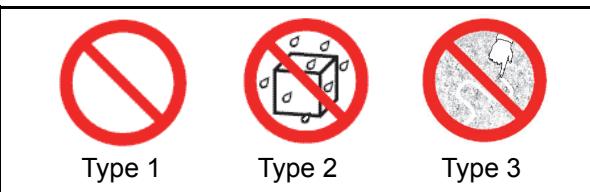
Figure 2 Precautionary Symbols

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. Be careful not to use excessive outside pressure on the Unit Frame when removing the Cash Box from the Unit.
4. 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.
5. Do not allow the Validator to endure a range of temperature and humidity beyond the environmental limits specified (See "Environmental Specifications" on page 7).
6. Do not use the Validator in environments that may be subject to extreme temperature changes.
7. Do not use the Validator where it may be exposed to airborne evaporated or sporadic chemicals.
8. Clean and maintain the Validator 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 Transport Unit, ensure that the Transport Part is properly replaced in its correct original location and will not move forward 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 Upper Tray of the Validator, ensure that it clicks firmly into place.

> ⚠ **Caution: Be careful to avoid personal injury to your fingers when closing the Upper Guide Section.**

2. Do not redesign or disassemble the DBV-500 Validator. 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 Validator, as this may cause extreme damage to the Unit.**

3. Perform routine cleaning and maintenance at least once a month to keep the DBV-500 Unit's performance stable.
4. Use a soft, lint-free cloth, cotton swab or compressed air spray to clean dust and debris from the 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

Damaged Banknotes

Wrinkled Banknotes

Curled Banknotes

Folded or Partial Banknotes
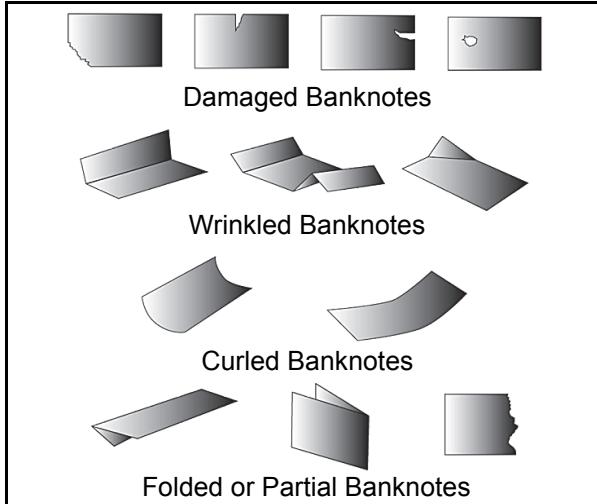
Figure 3 Unacceptable Banknotes

Primary Features

This DBV-500 Series Banknote Validator Unit contains the following primary features:

- **Automatic Centering –** The Centering Mechanism (Figure 4) allows the unit to read Banknotes without using special Banknote Guides. It improves the overall acceptance rate.
- **High-Speed Processing –** The validation processing speed is less than two seconds by the precision high performance validation sensors.
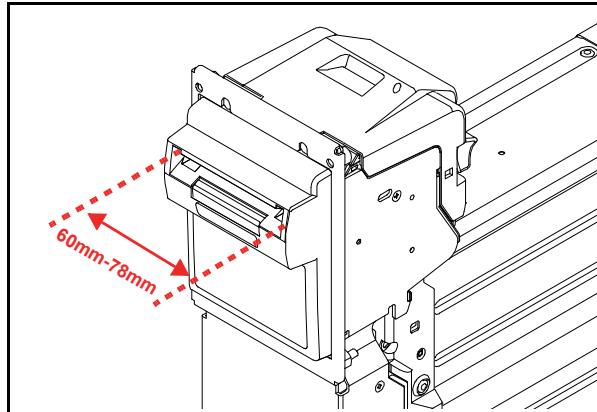
Figure 4 Automatic Centering Mechanism

Component Names

Figure 5 illustrates the DBV-500 component names and locations.

Option Items

a) Bezel
b) Full-Color Indicator
c) Transport Unit
d) Cash Box
e) Cash Box Latches
f) Unit Guide Open/Close Latches
g) Power/Interface Connector
h) USB Connector (For Maintenance)
i) DIP Switch Block 1
j) DIP Switch Block 2

Option Items

k) Handle
l) Frame Lock
m) Plastic Latch
n) Metal Lock
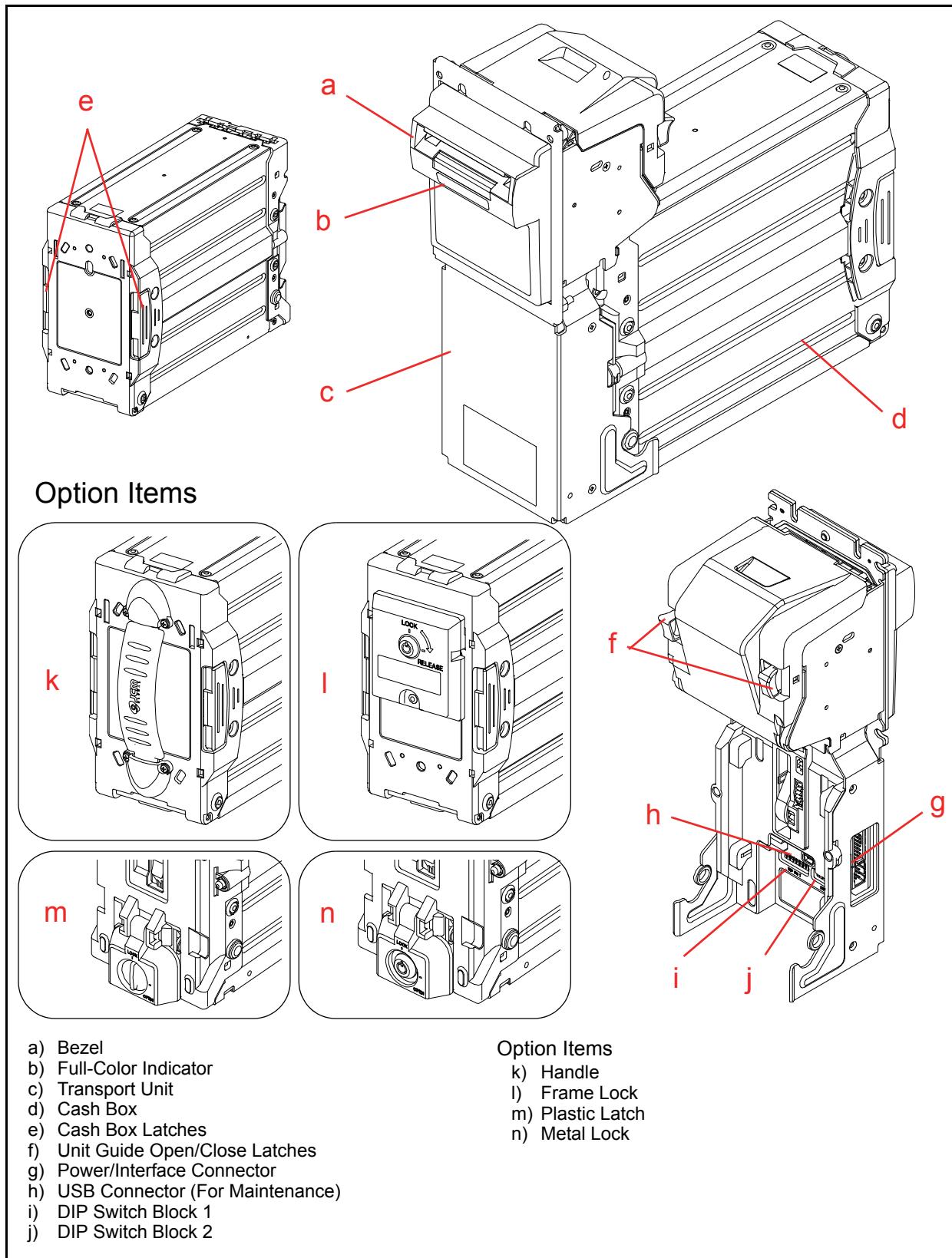
Figure 5 DBV-500 Component Names

2   SPECIFICATIONS
Technical Specifications

Table 4 DBV-500 Technical Specifications

Acceptance Rate[*]:	98% 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.
Banknote Types Accepted:	• Long side: 120-160mm (4.72-6.29 in.) 120-177mm (4.72-6.97 in.) (Option) • Short side: 60-78mm (2.36-3.07 in.)
Insertion Direction:	Four-Way[†]
Processing Speed[‡]:	Less than 2 seconds (from Banknote insertion to next Banknote insertion)
Validation Method:	Optical Sensor (Transmissive/Reflection) and Magnetic Sensor[**]
Diagnostic Indicators:	Bezel Insertion Slot Display: Full-Color + Light Amount DA Control
Escrow:	1 Note
Anti-stringing Mechanism:	Optical Detection and Internal Cash Box Lever
Cash Box Capacity[††]:	Approximately 500 notes (new Banknotes) Approximately 1000 notes (new Banknotes) Approximately 1400 notes (new Banknotes)
Cash Box Access:	Rear Access
Interface[‡‡]:	Photo-Coupler Isolation [MDB] TTL [ID-003, ID-044, CCNET] RS232C [ID-003, CCNET] USB [ID-008]

[*]. Refer to the specific Country's "Software Information Sheet" for each Country's particular Banknote acceptance rate.

[†]. Refer to the specific Country's "Software Information Sheet" for each Country's particular Banknote insertion direction.

[‡]. Excluding Host Communication time lag (Power Supply: +12V DC, Temperature: 25º C ±5º C, Humidity: 30%-60%).

[**].The Magnetic Sensor method depends on the Model.

[††].The number of Notes stacked depends on the Banknote's condition.

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

Environmental Specifications

Table 5 DBV-500 Environmental Specifications

Operating Temperature:	-15ºC to +60ºC (5ºF to 140ºF)*
Storage Temperature:	-20ºC to +60ºC (-4ºF to 140ºF)*
Relative Operating Humidity:	15% to 90% RH (non-condensed)
Relative Storage Humidity:	15% to 90% RH (non-condensed)
Visible Light Sensitivity:	Avoid contact with direct sunlight (Interior lighting must be incandescent with a Radiant Angle of 15 Degrees or more having an Illumination index of 3000 Lux or less)
Installation:	Indoors Only

*. Depends on hydrothermal conditions.

Hydrothermal Condition Table

- -15ºC/30RH%
- 40ºC/90RH%
- 60ºC/30RH%
- 10ºC/15RH%
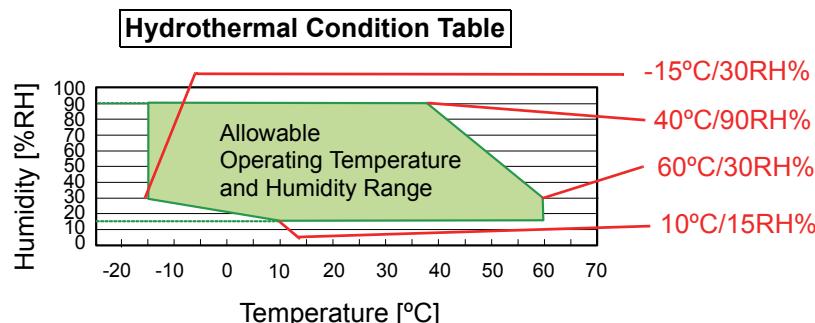
Electrical Specifications

Table 6 DBV-500 Electrical Specifications

Supply Voltage*:	12V DC ±5% (Greater than 2.5A/40W) 24V DC ±5% (Greater than 1.6A/40W)
Current Consumption:	12V DC • Standby = 312mA • Operation = 1.1A • Peak = 2.0A 24V DC • Standby = 184mA • Operation = 0.5A • Peak = 1.3A Sleep Mode • Mode A = 40µA (Typ) • Mode B = 150µA (Typ)

*. Use a Current Source Limiting Power Supply

Structural Specifications

Table 7 DBV-500 Structural Specifications

Weight:	Unit with Bezel: Approximately 1.4kg (3.09lbs.) 500 notes Cash Box: Approximately 0.8kg (1.76lbs.) 1000 notes Cash Box: Approximately 1.0kg (2.20lbs.) 1400 notes Cash Box: Approximately 1.2kg (2.64lbs.)
Mounting:	Horizontal
Outside Dimensions:	See "Entire Unit Outside Dimensions" on page 33 of this Manual

3   INSTALLATION

This section provides installation and operating instructions for the DBV-500 Banknote Validator unit. The information within this section contains the following features:

- Installation Procedure
- Lock Installation
- DIP Switch Configurations

Installation Procedure

The DBV-500 Frame Unit provides installation grooves for each surface.

ENTIRE UNIT INSTALLATION

Perform the following steps to install the DBV-500 Series Unit:

1. Place the DBV-500 Unit Frame cut outs (Figure 6 a_1 through a_4) on to the Threaded Studs on the chassis.
2. Secure the rear side of the DBV-500 Frame to the chassis with four (4) nuts.
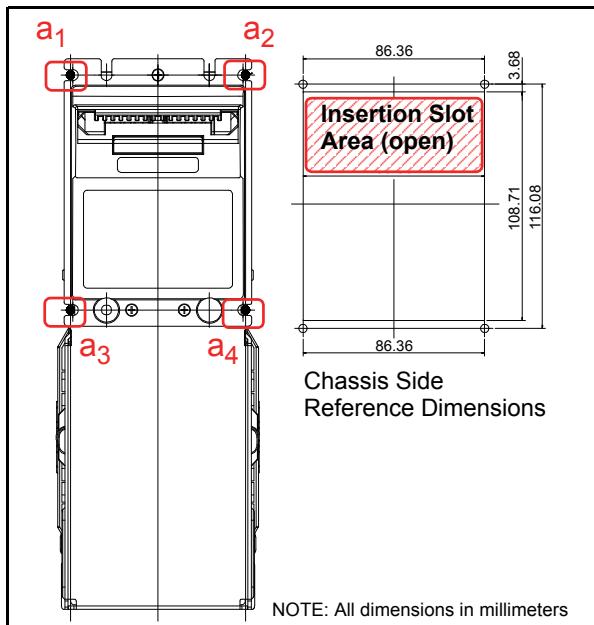
Figure 6 Thread Studs Location

LOCK DIMENSION REFERENCE
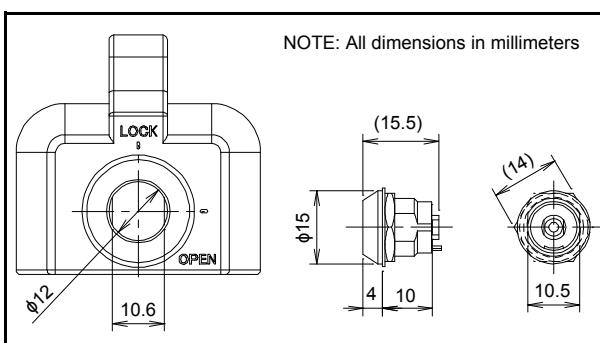
Figure 7 Lock Dimension Reference

Lock Installation

There are two (2) Cash Box Locks and single (1) Frame Lock available for securing the DBV-500.

PLASTIC LATCH INSTALLATION

To install the Plastic Latch to the DBV-500 Cash Box, perform the following steps:

1. Place the Door Lock A (Figure 8 a) from the front side of the lock installation hole.
2. Install the Door Lock B (Figure 8 b) from the inside of the lock installation hole while confirming that the Door Lock A Tab is in the vertical direction.
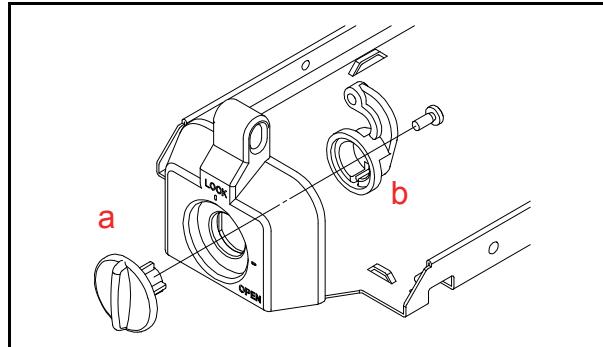
Figure 8 Plastic Latch Installation 1

3. Retain the Door Lock A and the Door Lock B by the single (1) 2.6x8 Phillips, Self-Tapping, Binding Head Screw (Figure 9 a).
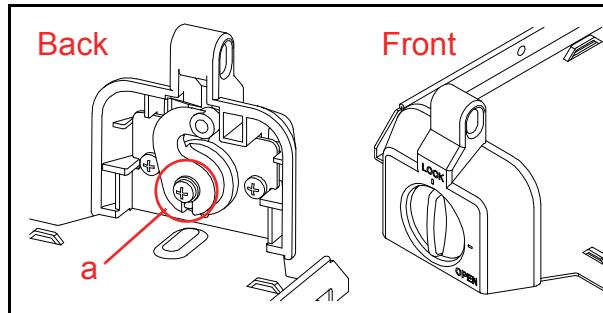
Figure 9 Plastic Latch Installation 2

METAL LOCK INSTALLATION

To install the Metal Lock to the DBV-500 Cash Box, perform following steps:

1. Place the Cylinder (Figure 10 a) from the front side of the lock installation hole.
2. Install the Cylinder attachments (Figure 10 b_1 & b_2) and the Door Lock Tang (Figure 10 c) from the inside of the lock installation hole while confirming that the Cylinder direction is correct.
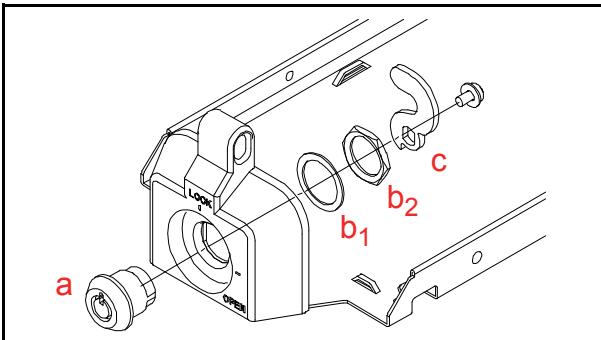
Figure 10 Metal Lock Installation 1

3. Retain the Cylinder and the Door Lock Tang by the single (1) Screw provided with the Cylinder (Figure 11 a).

Back   Front
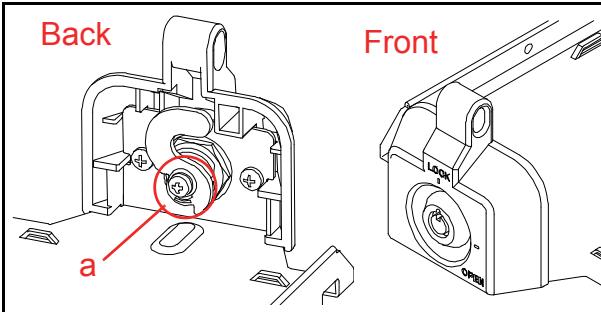
Figure 11 Metal Lock Installation 2

FRAME LOCK INSTALLATION

To install the Frame Lock to the DBV-500 Cash Box, perform following steps:

1. Place the Cylinder (Figure 12 a) from the front side of the lock installation hole.
2. Install the Cylinder attachments (Figure 12 b₁ & b₂) and the Door Lock Tang (Figure 12 c) from the inside of the lock installation hole while confirming that the Cylinder direction is correct.
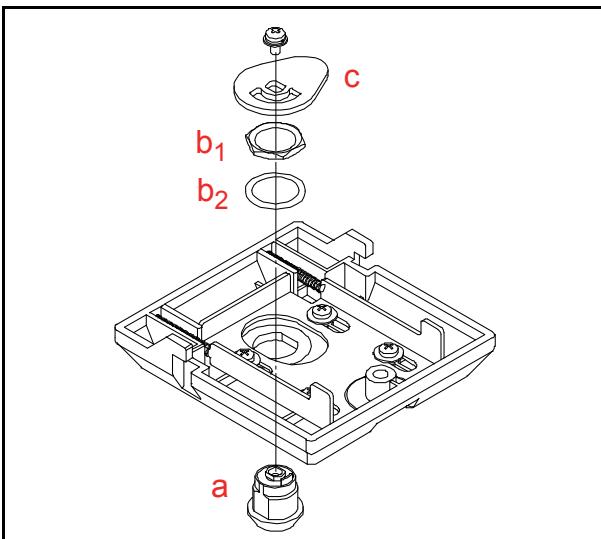
Figure 12 Frame Lock Installation 1

3. Retain the Cylinder and the Door Lock Tang by the single (1) Screw provided with the Cylinder (Figure 13 a).
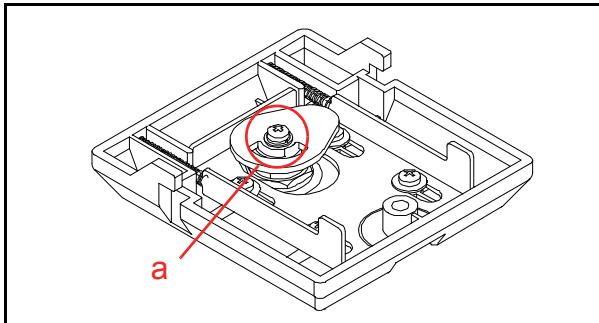
Figure 13 Frame Lock Installation 2

4. Place the Frame Lock assembly on the rear side of the Cash Box. Be sure that the both sides of the Frame Lock Tabs are inserted to the Tab holes of the Cash Box (Figure 14).
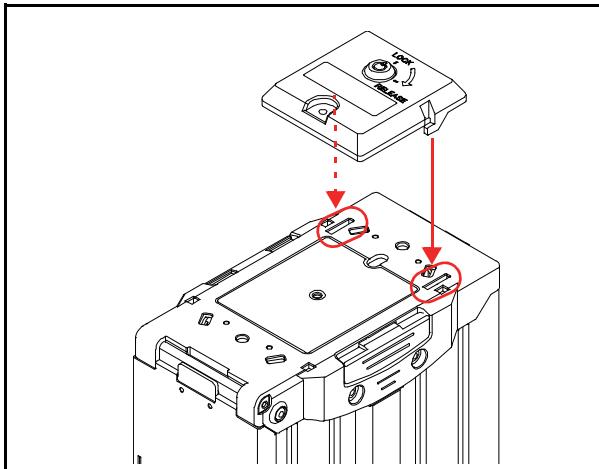
Figure 14 Frame Lock Installation 3

5. Slide the Frame Lock assembly down to firmly latch it on to the Cash Box (Figure 15).
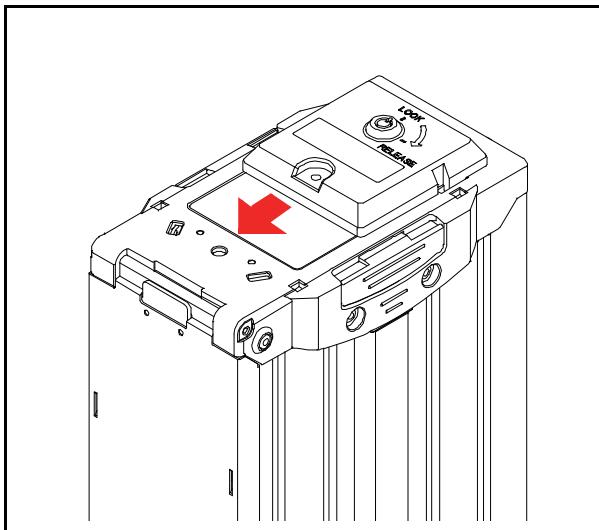
Figure 15 Frame Lock Installation 4

6. Retain the Frame Lock assembly to the Cash Box by the single (1) Blind Revet (Figure 16 a) with the φ10 Washer (Figure 16 b).
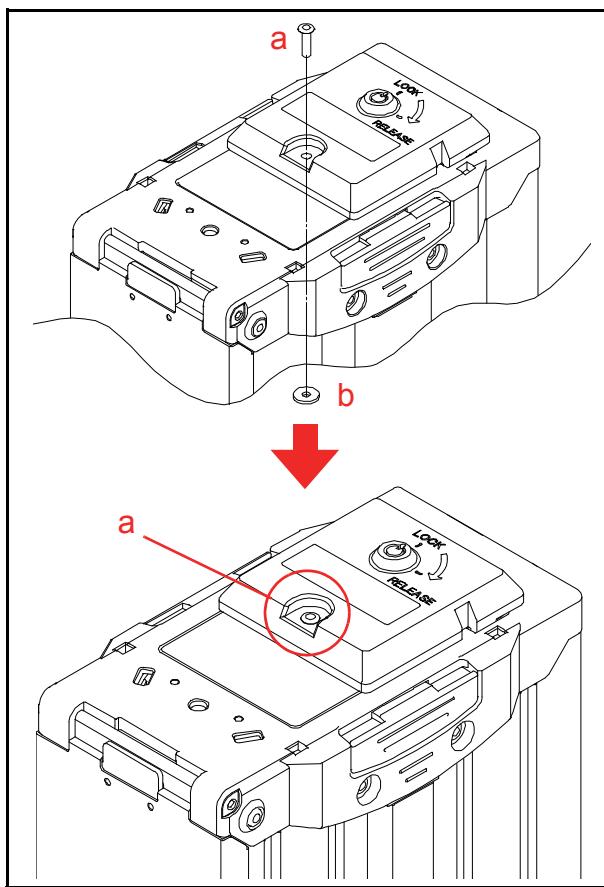
Figure 16 Frame Lock Installation 5

DIP Switch Configurations

This section provides the DIP Switch Block 1 (DS1) and 2 (DS2) Settings for the DBV-500 Unit.

DIP SWITCH BLOCK 1

DIP Switch Block 1 is used for setting the acceptable denominations.

Table 8 DIP Switch Block 1 Settings

Switch No.	Switch ON	Switch OFF
	DS1	
1	VEND 1 INHIBIT	VEND 1 ACCEPT
2	VEND 2 INHIBIT	VEND 2 ACCEPT
3	VEND 3 INHIBIT	VEND 3 ACCEPT
4	VEND 4 INHIBIT	VEND 4 ACCEPT
5	VEND 5 INHIBIT	VEND 5 ACCEPT
6	VEND 6 INHIBIT	VEND 6 ACCEPT
7	VEND 7 INHIBIT	VEND 7 ACCEPT
8	OFF	OFF

DIP SWITCH BLOCK 2

DIP Switch Block 2 is used for setting the functions.

Table 9 DIP Switch Block 2 Settings

Switch No.	Switch ON	Switch OFF
	DS2	
1	-	OFF
2	-	OFF
3	-	OFF
4	-	OFF
5	-	OFF
6	-	OFF
7	-	OFF
8	-	OFF

4   CONNECTOR PIN ASSIGNMENTS

Table 10 through Table 21 list the DBV-500 Unit's pin assignments.

PHOTO-COUPLER ISOLATION CONNECTOR PIN ASSIGNMENTS

Table 10 lists the DBV-500 Photo-Coupler Isolation Unit Side Connector Pin Assignments.

Table 10 DBV-500 Photo-Coupler Isolation Unit Side Connector Pin Assignments

	Power Source: MDB Connector **Connector (Transport Unit Side): 74164-0006 (MOLEX)**		
Pin No.	**Signal Name**	**I/O**[*]	**Function**
1	+12V/+24V	-	+12V/24V DC Power Supply
2	GND	-	Power Ground (0V DC)
3	WAKEUP0	I/O	Wake Up Signal Line (+5V to 12V)[†]
4	MASTER RECEIVE	O	Output Signal Line from Validator to Controller
5	MASTER TRANSMIT	I	Output Signal Line from Controller to Validator
6	COMMON		Signal Ground

[*]. I/O (input/output) is the terminal as viewed from the Banknote Validator's backside.

[†]. No connection when the Pin #3 is not used.

Table 11 lists the DBV-500 Photo-Coupler Interface Pin Assignments.

Table 11 DBV-500 Photo-Coupler Interface Pin Assignments[*]

	CN12 Interface Connector **Connector (Transport Unit Side): 5-103166-7 (TycoAMP)**		
Pin No.	**Signal Name**	**I/O**[†]	**Function**
1-18	NC	-	No Connection

[*]. Interface Setting by DIP Switch is required.

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

RS232C CONNECTOR PIN ASSIGNMENT

Table 12 lists the DBV-500 RS232C Unit Side Connector Pin Assignments.

Table 12 DBV-500 RS232C Unit Side Connector Pin Assignments

5 3 1 / 6 4 2	**Power Source: MDB Connector** **Connector (Transport Unit Side): 74164-0006 (MOLEX)**	

Pin No.	Signal Name	I/O*	Function
1	+12V/+24V	-	+12V/24V DC Power Supply
2	GND	-	Power Ground (0V DC)
3	NC	-	No Connection
4	NC	-	No Connection
5	NC	-	No Connection
6	NC	-	No Connection

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

Table 13 lists the DBV-500 RS232C Interface Pin Assignments.

Table 13 DBV-500 RS232C Interface Pin Assignments[*]

1 2 3 4 5 6 7 8 9 / 10 11 12 13 14 15 16 17 18	**CN12 Interface Connector** **Connector (Transport Unit Side): 5-103166-7 (TycoAMP)**	

Pin No.	Signal Name	I/O†	Function
1	NC	-	No Connection
2	NC	-	No Connection
3	NC	-	No Connection
4	GND (I/F)	-	Signal Ground (0V DC)
5	NC	-	No Connection
6	NC	-	No Connection
7	NC	-	No Connection
8	NC	-	No Connection
9	NC	-	No Connection
10	NC	-	No Connection
11	NC	-	No Connection
12	NC	-	No Connection
13	NC	-	No Connection
14	NC	-	No Connection
15	RXD (RS232C)	I	Serial Communication Input Signal Line
16	NC	-	No Connection
17	TXD (RS232C)	O	Serial Communication Output Signal Line
18	NC	-	No Connection

*. Interface Setting by DIP Switch is required.

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

TTL CONNECTOR PIN ASSIGNMENT

Table 14 lists the DBV-500 TTL Unit Side Connector Pin Assignments.

Table 14 DBV-500 TTL Unit Side Connector Pin Assignments

5 3 1 **6 4 2**		**Power Source: MDB Connector** **Connector (Transport Unit Side): 74164-0006 (MOLEX)**

Pin No.	Signal Name	I/O*	Function
1	+12V/+24V	-	+12V/24V DC Power Supply
2	GND	-	Power Ground (0V DC)
3	NC	-	No Connection
4	NC	-	No Connection
5	NC	-	No Connection
6	NC	-	No Connection

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

Table 15 lists the DBV-500 TTL Interface Pin Assignments.

Table 15 DBV-500 TTL Interface Pin Assignments[*]

1 2 3 4 5 6 7 8 9 **10 11 12 13 14 15 16 17 18**		**CN12 Interface Connector** **Connector (Transport Unit Side): 5-103166-7 (TycoAMP)**

| Pin No.	Signal Name	I/O[†]	Function
1	NC	-	No Connection
2	NC	-	No Connection
3	NC	-	No Connection
4	GND (I/F)	-	Signal Ground (0V DC)
5	NC	-	No Connection
6	NC	-	No Connection
7	NC	-	No Connection
8	NC	-	No Connection
9	NC	-	No Connection
10	NC	-	No Connection
11	RXD (TTL)	O	Serial Communication Output Signal Line (+5V)
12	NC	-	No Connection
13	NC	-	No Connection
14	NC	-	No Connection
15	NC	-	No Connection
16	TXD (TTL)	I	Serial Communication Input Signal Line (+5V)
17	NC	-	No Connection
18	NC	-	No Connection

*. Interface Setting by DIP Switch is required.

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

USB CONNECTOR PIN ASSIGNMENT

Table 16 lists the DBV-500 USB Unit Side Connector Pin Assignments.

Table 16 DBV-500 USB Unit Side Connector Pin Assignments

	Power Source: MDB Connector Connector (Transport Unit Side): 74164-0006 (MOLEX)		
Pin No.	**Signal Name**	**I/O***	**Function**
1	+12V/+24V	-	+12V/24V DC Power Supply
2	GND	-	Power Ground (0V DC)
3	NC	-	No Connection
4	NC	-	No Connection
5	NC	-	No Connection
6	NC	-	No Connection

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

Table 17 lists the DBV-500 USB Interface Pin Assignments.

Table 17 DBV-500 USB Interface Pin Assignments*

	CN12 Interface Connector Connector (Transport Unit Side): 5-103166-7 (TycoAMP)		
Pin No.	**Signal Name**	**I/O†**	**Function**
1	NC	-	No Connection
2	NC	-	No Connection
3	NC	-	No Connection
4	NC	-	No Connection
5	NC	-	No Connection
6	VBUS	-	USB Communication VBUS Signal Line (+5V)
7	USBDM	I/O	USB Communication Input/Output Signal Line
8	USBDP	I/O	USB Communication Input/Output Signal Line
9	GND	-	USB Communication Ground (0V DC)
10	NC	-	No Connection
11	NC	-	No Connection
12	NC	-	No Connection
13	NC	-	No Connection
14	NC	-	No Connection
15	NC	-	No Connection
16	NC	-	No Connection
17	NC	-	No Connection
18	NC	-	No Connection

*. Interface Setting by DIP Switch is required.

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

ID-044 CONNECTOR PIN ASSIGNMENT

Table 18 lists the DBV-500 ID-044 Unit Side Connector Pin Assignments.

Table 18 DBV-500 ID-044 Unit Side Connector Pin Assignments

5 3 1 6 4 2		**Power Source: MDB Connector** **Connector (Transport Unit Side): 74164-0006 (MOLEX)**

Pin No.	Signal Name	I/O*	Function
1	+12V/+24V	-	+12V/24V DC Power Supply
2	GND	-	Power Ground (0V DC)
3	NC	-	No Connection
4	NC	-	No Connection
5	NC	-	No Connection
6	NC	-	No Connection

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

Table 19 lists the DBV-500 ID-044 Interface Pin Assignments.

Table 19 DBV-500 ID-044 Interface Pin Assignments*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18		**CN12 Interface Connector** **Connector (Transport Unit Side): 5-103166-7 (TycoAMP)**

Pin No.	Signal Name	I/O†	Function
1	NC	-	No Connection
2	RTS/FULL	O	Serial Communication Output Signal Line (+5V)
3	NC	-	No Connection
4	GND (I/F)	-	Signal Ground (0V DC)
5	NC	-	No Connection
6	NC	-	No Connection
7	NC	-	No Connection
8	NC	-	No Connection
9	NC	-	No Connection
10	ABN	O	Serial Communication Output Signal Line (+5V)
11	/DATA, /VEND	O	Serial and Pulse Communication Output Signal Line (+5V)
12	D/E	I	Serial and Pulse Communication Input Signal Line (+5V)
13	LED-POWER	-	LED Power
14	NC	-	No Connection
15	/BUSY	O	Serial Communication Output Signal Line (+5V)
16	/CTS	I	Serial Communication Input Signal Line (+5V)
17	NC	-	No Connection
18	SOFT-R	I	Serial Communication Input Signal Line (+5V)

*. Interface Setting by DIP Switch is required.

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

DOWNLOAD CONNECTOR PIN ASSIGNMENT

Table 20 lists the DBV-500 Download Connector Pin Assignments.

Table 20 DBV-500 Download Connector Pin Assignments

| Pin No.	Signal Name	I/O*	Function
CN4 Connector (Transport Unit Side) USB Mini-B Connector for Download 000011211-00010 (MAIN SUPER)
1	USBo_VBUS	-	VBUS Signal Line (+5V)
2	USBo_DM	I/O	USB Communication Input/Output Signal Line
3	USBo_DP	I/O	USB Communication Input/Output Signal Line
4	NC	-	No Connection
5	GND	-	USB Communication Ground (0V DC)

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

OPTION CONNECTOR PIN ASSIGNMENT

Table 21 lists the DBV-500 Option Connector Pin Assignments.

Table 21 DBV-500 Option Connector Pin Assignments

Pin No.	Signal Name	I/O*	Function
CN2 Connector (Transport Unit Side) Option Connector B10B-ZR-3.4 (JST)
1	NC	-	No Connection
2	NC	-	No Connection
3	NC	-	No Connection
4	NC	-	No Connection
5	NC	-	No Connection
6	NC	-	No Connection
7	NC	-	No Connection
8	NC	-	No Connection
9	NC	-	No Connection
10	NC	-	No Connection

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

5   PREVENTIVE MAINTENANCE

Retrieving Banknotes

To retrieve Cash Box deposited Banknotes, perform the following steps:

1. Press the Cash Box Latches (Figure 17 a) located on both sides of the Cash Box and pull the Cash Box out in the direction indicated by the Red arrow.
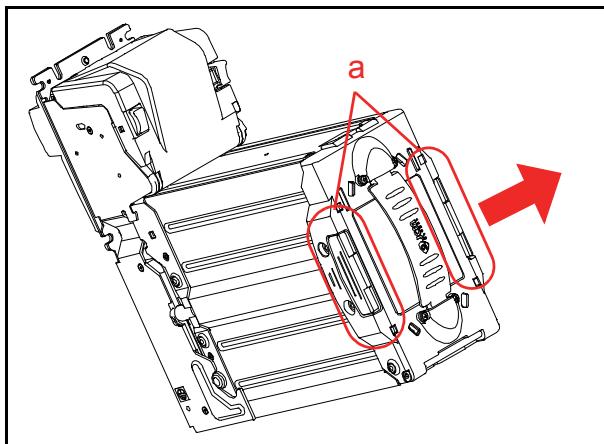
Figure 17 Retrieving Banknotes 1

2. Rotate the Plastic Latch or the Metal Lock clockwise until in the "OPEN" position and the lock releases (Figure 18).

Plastic Latch   Metal Lock
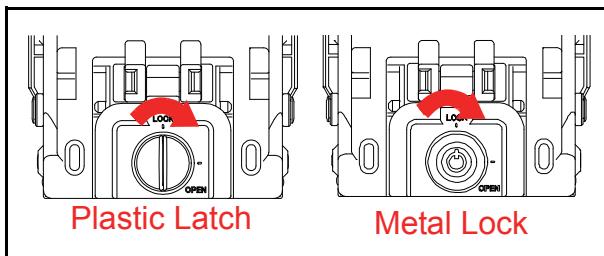
Figure 18 Retrieving Banknotes 2

3. Open the Cash Box Door (Figure 19 a) and retrieve the Banknotes.
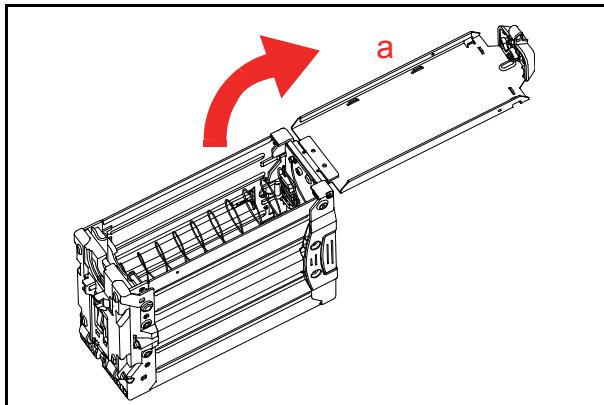
Figure 19 Retrieving Banknotes 3

Clearing a Banknote Jam

To retrieve a jammed Banknote located inside the Banknote Validator, proceed as follows:

1. Press the Unit Guide Open/Close Latches (Figure 20 a).
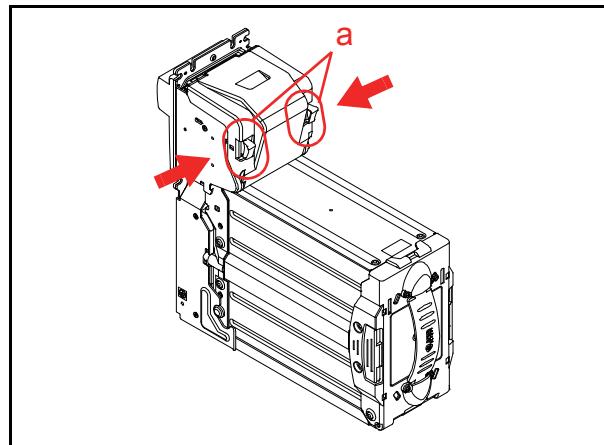
Figure 20 JAM Clear 1

2. Rotate the entire Upper Tray in the direction indicated by the red arrow A (Figure 21).

   ☞ *NOTE: The Upper Tray can be rotated open to 75º maximum when the Cash Box is seated.*
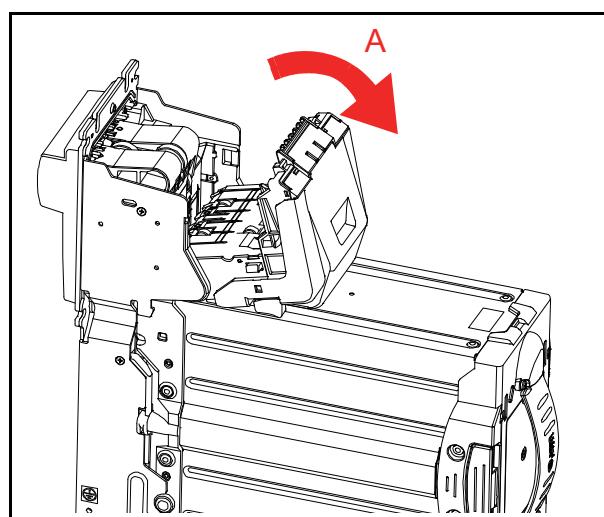
Figure 21 JAM Clear 2

3. When a jammed Banknote is not visible, grab the Cash Box Latches (Figure 22 a) located on both sides of the rear Cash Box and pull the Cash Box out of the Frame Housing.
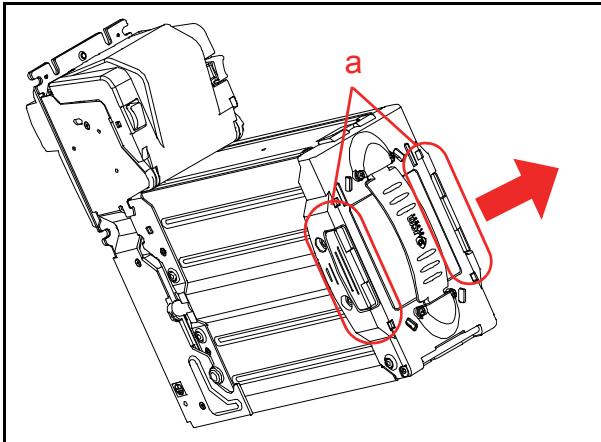
Figure 22 JAM Clear 3

4. Press the Unit Guide Open/Close Latches and rotate entire Upper Tray in direction indicated by the red arrow A (Figure 23).

    👉 *NOTE: The Upper Tray can be rotated open to 178º maximum after removing the Cash Box.*
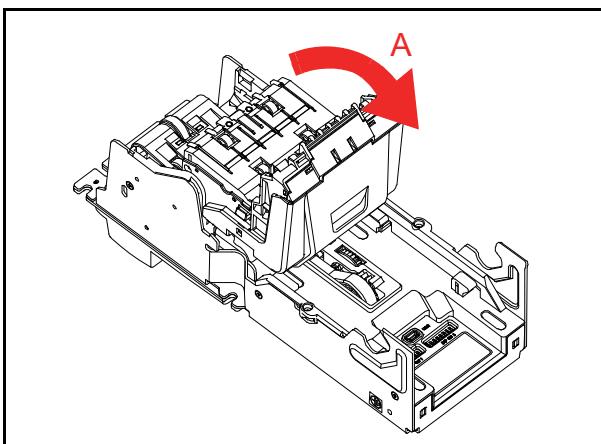

Figure 23 JAM Clear 4

5. When a jammed Banknote is not visible, rotate the Plastic Latch or the Metal Lock clockwise until in the "OPEN" position and the lock releases (Figure 24).


Plastic Latch   Metal Lock
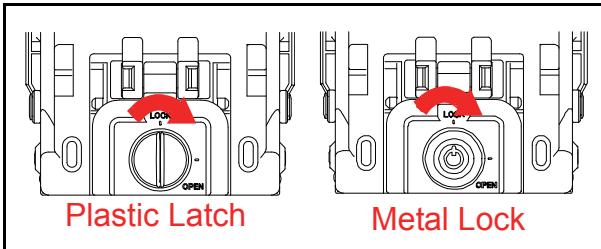
Figure 24 JAM Clear 5

6. Open the Cash Box Door (Figure 25 a) and remove a jammed Banknote.
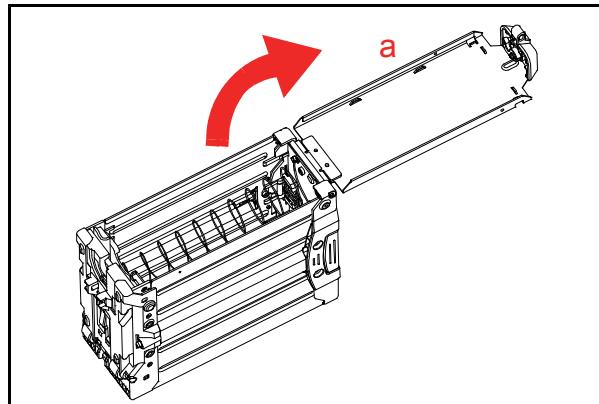
Figure 25 JAM Clear 6

Cleaning Procedure

To clean the DBV-500 Validation Section, 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 Validation Section Sensors and/or Rollers.

SENSOR AND ROLLER CLEANING PROCEDURE

To clean the DBV-500 Unit's Sensors and Rollers, proceed as follows:

1. Turn the power **OFF** on both DBV-500 and the Host Machine.
2. Open the DBV-500 Units Front and Rear Guide.
3. Clean the appropriate path and Lens of each Sensor.

⚠️ **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.**

Lens   Roller   Belt

Before Cleaning

After Cleaning

Lint-free Cloth/Cotton Swab/Air Jet
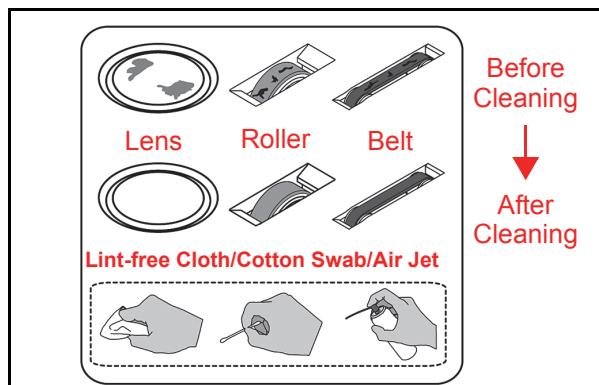
Figure 26 General Cleaning Image

👉 *NOTE: Calibration is recommended after cleaning.*

SENSOR AND ROLLER LOCATIONS

Figure 27 illustrates the various DBV-500 Unit's sensor and roller cleaning locations. Table 22 lists the DBV-500 sensor type cleaning methods.

Note: Clean Rollers using a lint-free, slightly damp with water Micro-fiber cloth.
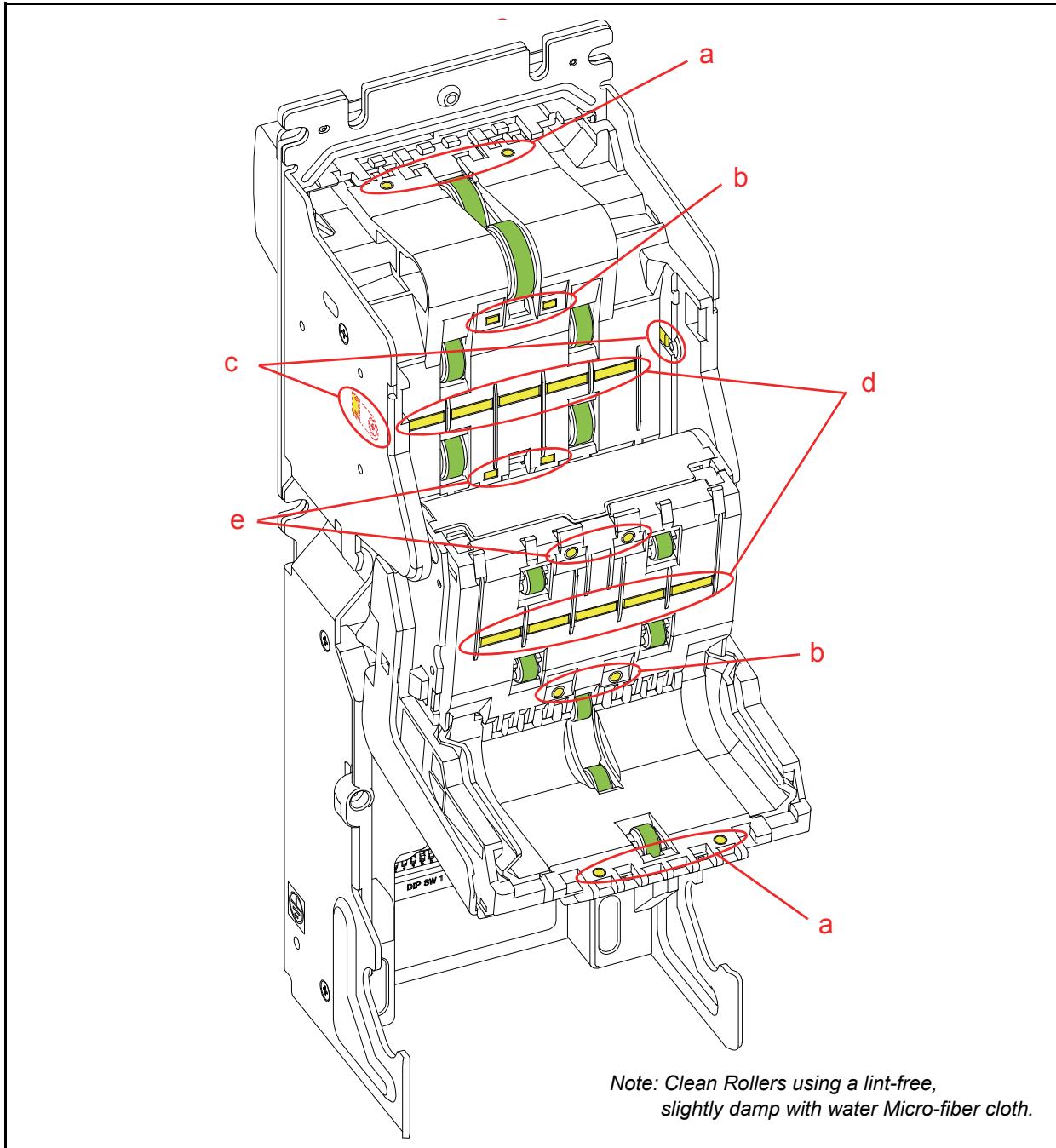
Figure 27 DBV-500 Sensor and Roller Cleaning Locations

Table 22 DBV-500 Sensor Type Cleaning Methods

Sym.	Sensor/Roller Type	Cleaning Method
a	Entrance Sensor	
b	Centering Start Sensor	Wipe clean using a soft lint-free cloth or blow clean using compressed air.
c	Side Sensor	
d	COB Sensor	
e	Exit Sensor	

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6 STANDARD INTERFACE CIRCUIT SCHEMATICS

Figure 28 illustrates the DBV-500 Photo-Coupler Interface Schematic Diagram.
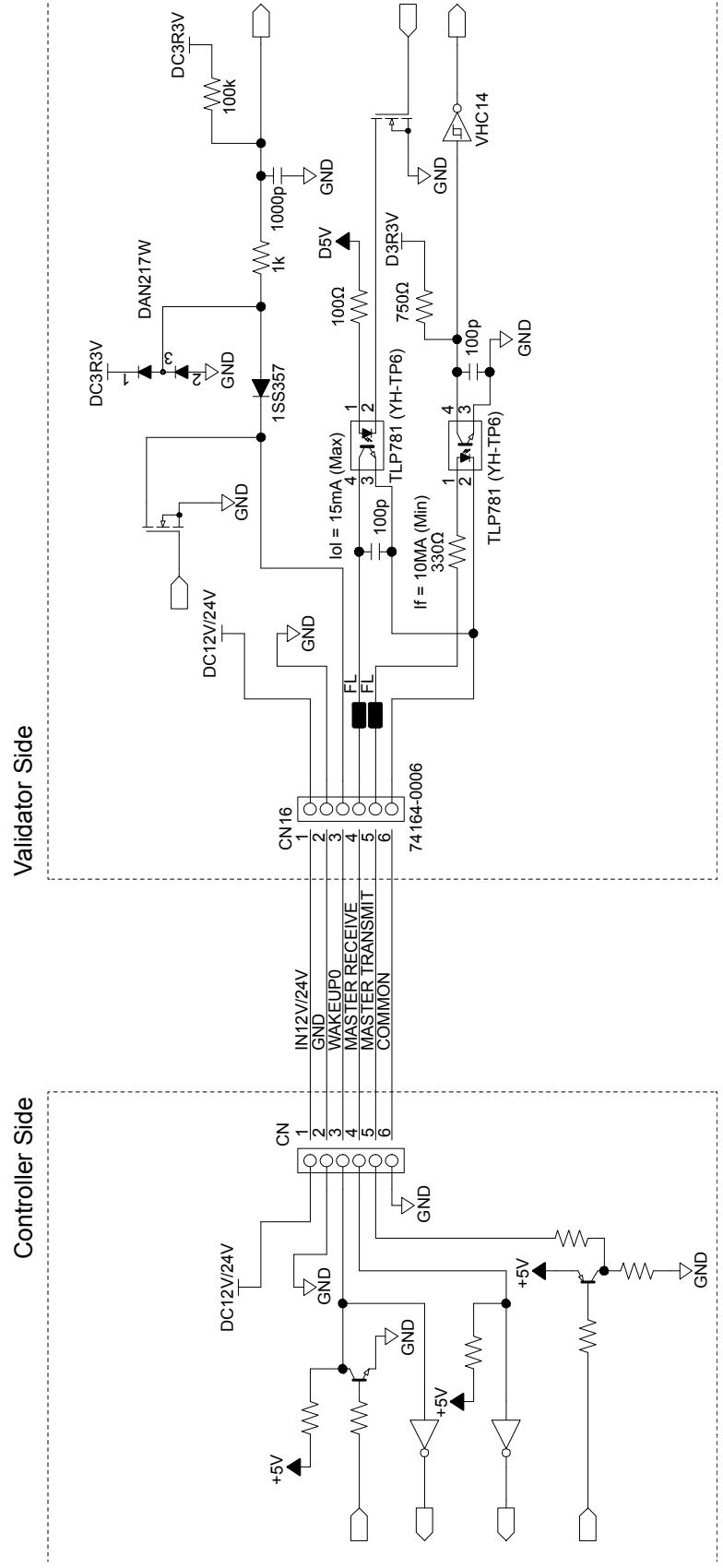
Figure 28 DBV-500 Photo-Coupler Interface Schematic Diagram

STANDARD INTERFACE CIRCUIT SCHEMATICS (CONTINUED 1)

Figure 29 illustrates the DBV-500 RS232C Interface Schematic Diagram.
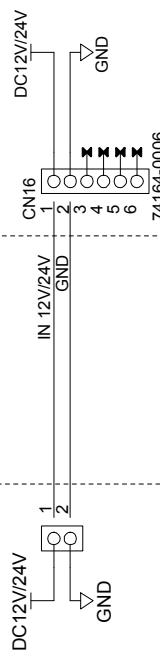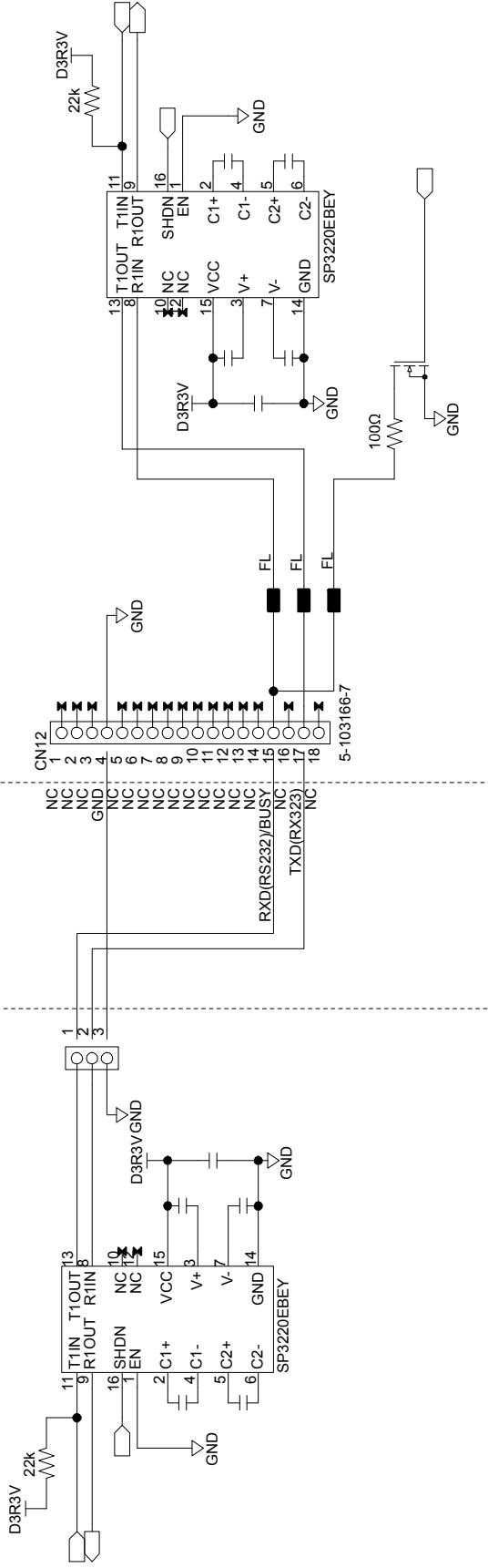
Figure 29 DBV-500 RS232C Interface Schematic Diagram

STANDARD INTERFACE CIRCUIT SCHEMATICS (CONTINUED 2)

Figure 30 illustrates the DBV-500 ID-044 PULSE Interface Schematic Diagram.
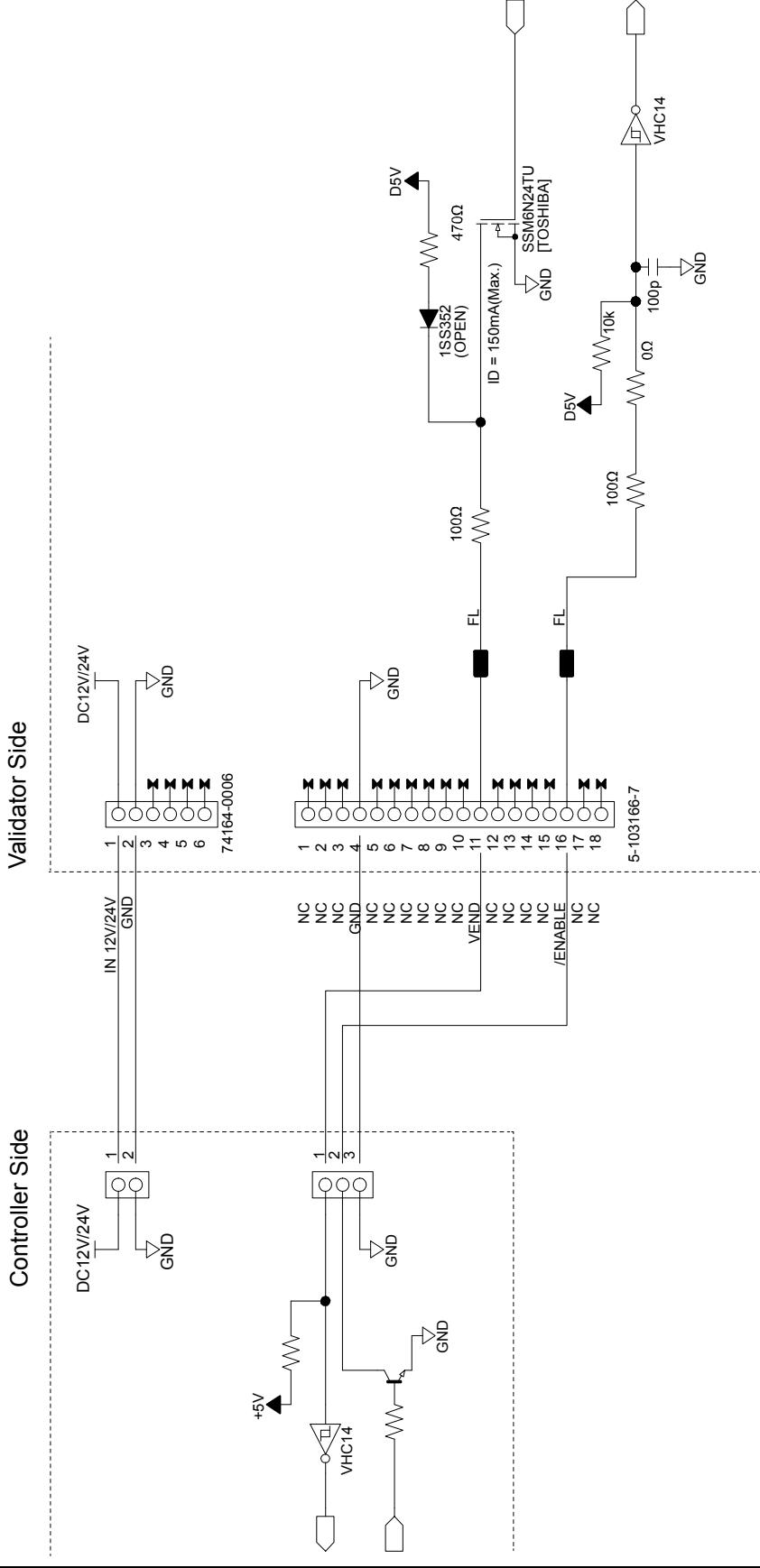
Figure 30 DBV-500 ID-044 PULSE Interface Schematic Diagram

STANDARD INTERFACE CIRCUIT SCHEMATICS (CONTINUED 3)

Figure 31 illustrates the DBV-500 ID-044 SERIAL Interface Schematic Diagram.
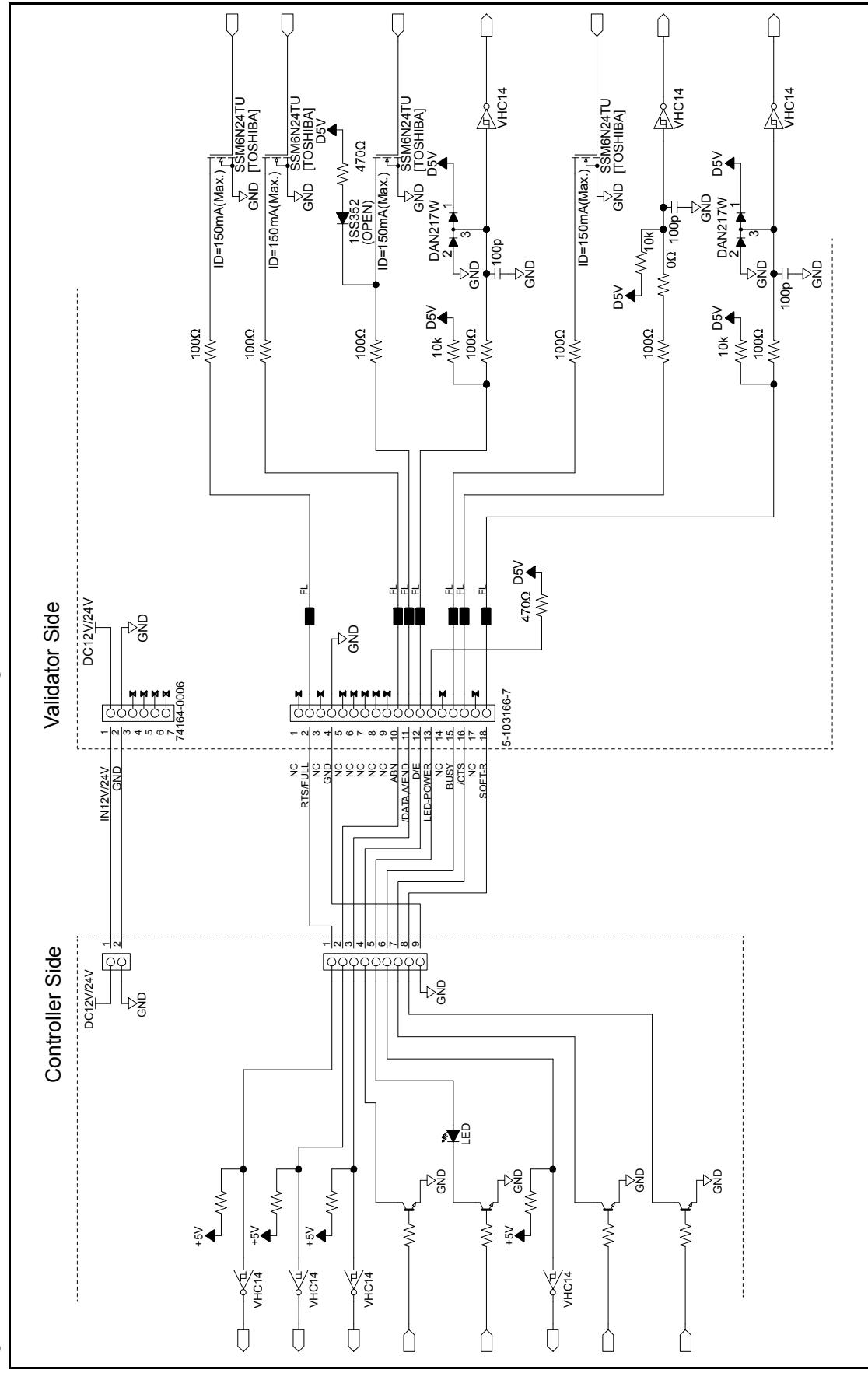
Figure 31 DBV-500 ID-044 SERIAL Interface Schematic Diagram

7 OPERATIONAL FLOWCHART

Figure 32 depicts DBV-500 Initialization Banknote acceptance flow process.

a	a) Apply Power to the Unit.
b	b) Initializing
C	C) Return from "Stacking" Flow (See Figure 34)
c	c) Stand-by
d (NO → e) YES	d) Enable Acceptance?
e	e) External LED Display shows No Accept Pattern
f	f) External LED Display shows Enable Accept Pattern
g (NO) YES	g) Inserted Banknote?
h	h) Take the Banknote in
i	i) Centering the Banknote
j	j) Start Transporting the Banknote
k	k) Sampling the Banknote Data
l	l) Stop Transporting the Banknote
A	A) To "Validation" Flow (See Figure 33)

Figure 32 DBV-500 Operational Flowchart (Initializing)

Operational Flowchart (Continued 1)

Figure 33 depicts DBV-500 Validation Banknote acceptance flow process.

A) From "Initialize" Flow (See Figure 32)

a) Is the Banknote Authentic?

b) Is the Banknote acceptable?

c) Denomination Signal Output?

d) Has STACK Command been received?

D) From "i" function on this chart

f) Return the Banknote

e) Transporting the Banknote

g) Is the Banknote transported to Stacker?

i) Retried Acceptance Operation three times?

h) VEND Signal Output?

D) To "e" function on this chart

B) To "Stacking" Flow (See Figure 34)

j) Stop operation (Abnormal Signal Output)(*1)

*1). When an abnormal signal is received, remove and re-supply Power to the DBV-500 after resolving the problem, or send a RESET Command from the Host Machine.

Figure 33 DBV-500 Operational Flowchart (Validation)

Operational Flowchart (Continued 2)

Figure 34 depicts DBV-500 Stacking Banknote acceptance flow process.

B) From "Validation" Flow (See Figure 33)

a) Stack the Banknote

b) Is the Cash Box full?

c) Stop operation (Stacker Full Signal Output)(*2)
C) To "Initializing" flow (See Figure 32)

*2). When a "Cash Box Full" Signal is received, retrieve the Banknotes from the Cash Box and re-seat the Cash Box back into the Unit. The DBV-500 Unit will automatically perform its re-initialization movement operation.
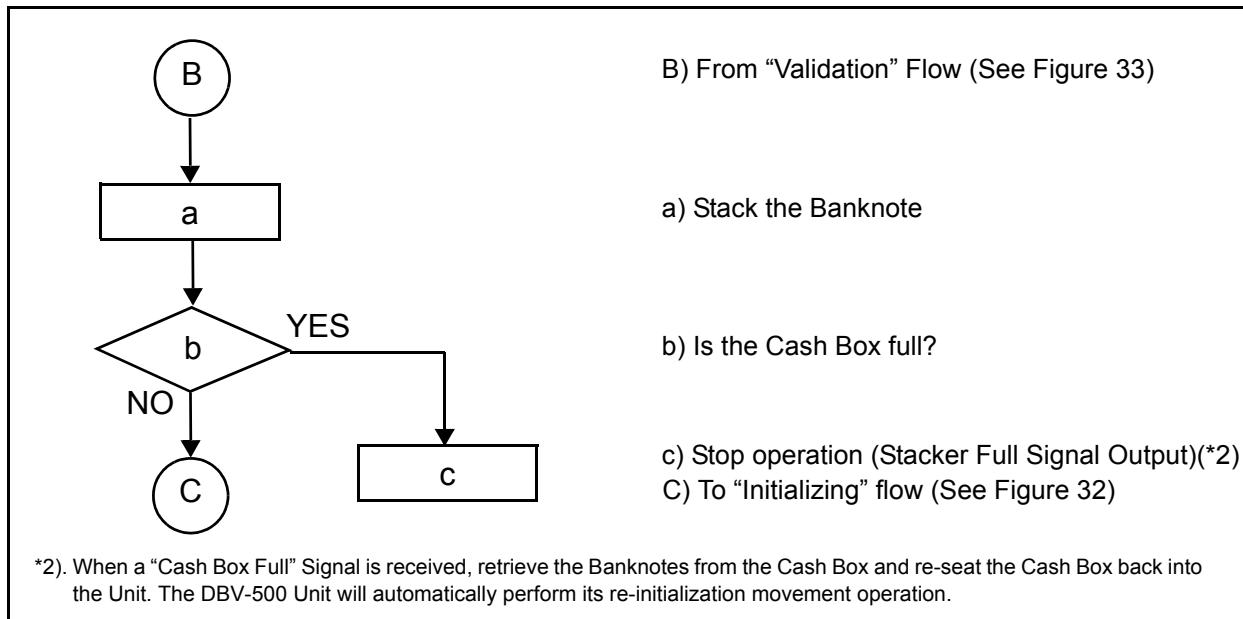
Figure 34 DBV-500 Operational Flowchart (Stacking)

8 TROUBLESHOOTING

This section provides troubleshooting instructions for the DBV-500 Banknote Validator Units, including the following information:

- Introduction
- Troubleshooting Overview
- Fault Table Listings
- LED Indication Conditions

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 DBV-500 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 DBV-500 Service Manual, and the Disassembly/Reassembly instructions in Section 4 of the DBV-500 Service 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 23, Table 24 and Table 25 list the various possible DBV-500 Unit fault conditions that can occur and the necessary actions required to correct them.

Table 23 General Fault Conditions

| Symptoms/Error Messages	Possible Fault Causes	Corrective Action Required
Banknote Validator is not working (does not accept any Banknotes)	**No external Power is applied to the Banknote Validator (+12/24V DC & GND)**	**Verify that the Power Supply +12/24V DC and Ground Cables are connected to their appropriate Pins on the main connector.** **NOTE: The small LED to the left of the Front Panel DIP Switches indicates power available when lit.**
	Wrong or inappropriate connections	**Verify that all Harness Connectors are properly connected.** **Check for any bent, missing or damaged Pins in the Connector Plugs and mating Receptacles.**
	Corrupted Software	**Re-download the correct Software.**
	CPU Board failure	**Conduct an Initial Performance Test. If the test result is Negative (NG), replace the CPU Board. Make sure to re-calibrate the Sensors after CPU Board is replaced.**
Banknote jams occur often	**A Pressure Roller is dirty or damaged**	**Clean all Pressure Rollers.** **Replace as necessary.**
	A pressure Roller Spring is loose or missing	**Check all Pressure Roller Springs using a finger pressure test.** **Replace as necessary.**
	A foreign object is lodged in the Transport path and/or inside the Cash Box	**Clean the Transport path and remove any foreign object discovered.**
	The Validator Unit is not properly seated all the way into the Frame (the Validator Unit's Latch Release Levers are not locked onto the Frame)	**Re-seat the Validator Unit back into the Frame so it is firmly seated. Ensure the Validator Unit Release Lever Latches lock securely onto the Frame.**
	The Banknote width is out of specification (Banknote is wider than 78 mm or narrower than 60mm)	**Use only Banknotes widths having the correct DBV-500 Unit's size specifications.**
Acceptance rates	**Dirt and/or stains on the Rollers and Lenses**	**Clean the Transport path. Refer to "Sensor and Roller Cleaning Procedure" on page 18.**
	The Unit has been disassembled, and calibration adjustments have not occurred following a reassembly	**Re-calibrate the Sensors after reassembling the DBV-500 Unit.**
	The wrong Software version or an older Software version is being used	**Make sure that the programmed Software is the latest version, and it supports the Currency values for the specific Country (e.g., check denomination/issuing year).**

Table 23 General Fault Conditions (Continued)

Symptoms/Error Messages	Possible Fault Causes	Corrective Action Required
Acceptance rates	Software not designed to accept current Banknotes	Check the particular specifications for the required Banknote Type Acceptance, and make sure the Banknotes will be accepted by the Software loaded (e.g., check denomination/issuing year).
Upper Guide can not be opened	Centering Guides are not at the Home position	Turn the Power OFF and ON again. This action should tell the Host Machine to send a Reset Command to re-initialize the Unit.
		If power cannot be applied, use a Hexagonal Nut Driver to open the Upper Guide, and manually reset the Guide.
All Banknotes being rejected	Incorrect software (different Currency type)	Download the correct Software for Currency being accepted.
	Banknotes are not being accepted by the Software	Make sure the Banknote values required are included in the Software Specifications (e.g., denominations/issuing year).
	Incorrect DIP Switch settings	Enable all denominations by setting all DIP Switches to OFF.
	Banknote acceptance is being inhibited by a Host Controller command	Enable Banknote acceptance for the required Host Command.
	Validation Sensor failure	Change the CPU Board and/or Sensor Board and calibrate.
	Unit was disassembled and calibration was not performed following reassembly	Calibrate all Sensors following reassembly.
Motor continues to run	Upper Guide is open	Firmly close the Upper Guide.
	A foreign object or a jammed Banknote is stuck in the Transport path	Open the Upper Guide, remove the foreign object or jammed Banknote, and close the Cover.
	Motor Drive failure	Conduct a Forward/Reverse Motor Rotation Test.
Can not enter the TEST mode	Incorrect DIP Switch settings	Set the DS1 DIP Switch No. 8 to ON, and reapply power to the DBV-500 Unit.
	Dip Switch failure	See Service Manual regarding the DIP Switch Test, and conduct a DIP Switch TEST to check if the specific DIP Switch Block contains a failure.
	CPU Board failure	Exchange the CPU Circuit Board with a known good Circuit Board and calibrate.

Adjustment Error

Table 24 lists the various possible DBV-500 Unit Adjustment fault conditions.

Table 24 Adjustment Fault Conditions

Symptoms/Error Messages	Possible Fault Causes	Corrective Action Required
Can not start the "DBV-500 CalibrationToolFor Maintenance.exe" program by double-clicking on its Icon	PC Operating System (OS) is not compatible	The current Adjustment program only supports the Windows 2000/XP/Windows 7 Operating Systems.
	The Program Files are corrupted	Request the correct programs from JCM.
Communication Error	Wrong or inappropriate connections	Check the PC Harness connections and the related DBV-500 Interface Connectors for damage. Check for any bent, missing or damaged Pins in the Connector Plugs and/or Receptacles.
	DBV-500 Switch settings are incorrect	Reset the DBV-500 DS1 DIP Switches #8 to ON (DIP Switch #1 through #7 settings are not specifically required). Apply power to the DBV-500 Unit.
	DIP Switch failure	See Service Manual regarding DIP Switch settings and conduct a DIP Switch Test.
	CPU Board failure	Exchange the CPU Circuit Board with a known good Circuit Board.
Adjustment Error	Incorrect Reference Paper type	Follow the instructions provided in the "DBV-500 CalibrationToolFor Maintenance.exe" Program and use the correct Reference Paper.
	Validation Sensor failure	Change the CPU Board and Sensor Board.

Communication Error

Table 25 lists the various possible DBV-500 Unit Communication fault conditions.

Table 25 Communication Fault Conditions

Symptoms/Error Messages	Possible Fault Causes	Corrective Action Required
Cannot communicate with the Host Machine	DIP Switch settings are incorrect	Set all DIP Switches to OFF.
	Connectors are off or loosely connected	Firmly connect all of the Communication Connectors.
	Damaged Connector Pins	Check for any bent, missing or damaged Pins in the Connector Plugs and mating Receptacles.
	CPU Board is corrupted	Exchange the CPU Circuit Board with a known good Circuit Board.
	Incorrect Interface	Verify that the correct interface between the Host Machine and the Banknote Validator is being used.

LED Indication Conditions

The External LED Display indicates various combinations of solid or alternating Color light flashing conditions when any of the Standard Errors listed in Table 26 occur.
Identify the cause and solution for an indicated error by comparing it against each listing in Table 26.

NOTE: The Error Codes flash different patterns when in the normal operation mode (communicating with the Host Machine) or when performing the Performance Tests. The LED shows more detailed flash patterns while running the performance test to identify the specific error causes.

LED Flash Error Code Conditions

Table 26 lists the various LED Flash Error Code causes & solutions for Banknotes.

Table 26 LED Flash Error Codes

Normal Operation LED Sequence	Performance Test LED Sequence	Error	Causes and Solutions
White (3)	White (1)	External Flash ROM Boot Program ROM Check Error	The Boot Program that is supposed to run after Power is supplied is not correctly written in ROM, or it cannot be read. [Solution] Check that the following part is properly assembled and/or Harness connected. [Relative Parts] CPU Circuit Board. If the error is not resolved, change the above related part or parts and calibrate the unit.
White (3)	White (2)	External Flash ROM Boot I/F Area ROM Check Error	The Boot Interface Area was not written correctly or cannot be read. [Solution] Re-download the Program. If the error is not resolved, check that the following part is assembled and/or Harness connected. [Relative Parts] CPU Circuit Board. If the error is not resolved, change the above related part or parts and calibrate the unit.
		External Flash ROM Main Program ROM Check Error	The Main Operating Program is not written into the ROM correctly, or cannot be read. [Solution] Re-download the Program. If the error is not resolved, check that the following part is properly assembled and/or Harness connected. [Relative Parts] CPU Circuit Board. If the error is not resolved, change the above related part or parts and calibrate the unit.
White (3)	White (3)	CPU Internal RAM Check Error	RAM reading or writing was not properly performed. [Solution] Check that the following part is properly assembled and/or Harness connected. [Relative Parts] CPU Circuit Board. If the error is not resolved, change the above related part or parts and calibrate the unit.
White (3)	White (4)	External SD-RAM Error	External SD-RAM reading or writing was not properly performed. [Solution] Check that the following part is properly assembled and/or Harness connected. [Relative Parts] CPU Circuit Board. If the error is not resolved, change the above related part or parts and calibrate the unit.

Table 26 LED Flash Error Codes (Continued)

Normal Operation LED Sequence	Performance Test LED Sequence	Error	Causes and Solutions
White (3)	White (5)	EEPROM Error	EEPROM reading, writing and/or saving was not properly performed. **[Solution]** Perform the Sensor Calibration procedure. If the error is not resolved, check that the following part is properly assembled and/or Harness connected. Clean or adjust the following part. **[Relative Parts]** CPU Circuit Board. If the error is not resolved, change the above related part or parts and calibrate the unit.
White (3)	White (6)	Downloading File Error	Downloading files does not proceed. **[Solution]** Select a file supported by the DBV-500 Unit.
White (3)	White (7)	Magnetic Sensor Setting Abnormal	An abnormal Magnetic Sensor setting is detected. **[Solution]** Check that the following part is properly assembled and/or Harness connected. Clean the following Sensor. **[Relative Parts]** Magnetic Sensor. If the error is not resolved, change the above related part or parts and calibrate the unit.
White (3)	White (8)	I2C Access Error	While communicating with each device on the CPU Board, Sensors detect an abnormal operating condition. **[Solution]** Check that the following part is properly assembled and/or Harness connected. Clean the following part. **[Relative Parts]** Stacker. If the error is not resolved, change the above related part or parts and calibrate the unit.
Red (3)	Red (1)	Stacker Motor Lock-Up	While operating the Stacker Motor, no pulse inputs occurred greater than the specified value. **[Solution]** Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. **[Relative Parts]** Stacker Motor, Stacker Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.
Red (3)	Red (2)	Pusher Mechanism Home Position Error	When stacking Banknotes, the Pusher Mechanism is not returning to the Home and position. **[Solution]** Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. **[Relative Parts]** Pusher Mechanism, Stacker Motor, Stacker Home Sensor, Stacker Motor Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.
Red (3)	Red (3)	Banknote Jam (Cash Box)	When transporting a Banknote in the Cash Box, the Sensors are not detecting a Banknote present condition when the time interval is too long, or the pulse number is greater than specified value for the function. **[Solution]** Remove Banknotes from the Cash Box. Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. **[Relative Parts]** Exit Sensor, Pusher Mechanism, Stacker Motor, Stacker Home Sensor, Stacker Motor Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.
Red (3)	Red (4)	Feed Motor Speed Error	While Initializing, no pulse inputs exist greater than the specified value. **[Solution]** Remove Banknotes from the DBV-500 Unit. Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. **[Relative Parts]** Feed Motor, Feed Motor Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.
Red (3)	Red (5)	Feed Motor Lock-Up	While operating the Feed Motor, no pulse inputs occurred greater than the specified value. **[Solution]** Check that the following part is properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. **[Relative Parts]** Feed Motor, Feed Motor Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.
Red (3)	Red (6)	Centering Mechanism Abnormal	The Centering Guide has not moved. **[Solution]** Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. **[Relative Parts]** Centering Guide, Centering Motor, Centering Guide Home Sensor. If the error is not resolved, change the above related part or parts and calibrate the unit.

Table 26 LED Flash Error Codes (Continued)

Normal Operation	Performance Test	Error	Causes and Solutions
LED Sequence	LED Sequence		
Red (3)	Red (7)	Reserved	Contact your local JCM Representative if this error occurs.
Red (3)	Red (8)	Fraud Detection	Sensors detect Banknotes occurring with abnormal timing. [Solution] Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. [Relative Parts] Entrance Sensor, Centering Timing Sensor, Validation Sensor, PB Entrance Sensor, PB Exit Sensor, Exit Sensor, Feed Motor and Feed Motor Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.
Purple (3)	Purple (1)	Cash Box Full	Sensors detected that the Cash Box is full. [Solution] Remove Banknotes from the Cash Box. Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. [Relative Parts] Pusher Mechanism, Stacker Motor, Stacker Home Sensor, Stacker Motor Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.
Purple (3)	Purple (2)	Cash Box Removal	The Cash Box has been removed. [Solution] Firmly re-seat the Cash Box. Check that the following part is properly assembled and/or Harness connected. Clean or adjust the following Sensor. [Relative Parts] Box Sensor. If the error is not resolved, change the above related part or parts and calibrate the unit.
Purple (3)	Purple (3)	Banknote Jam (Transport Unit)	When transporting or returning a Banknote in the Transport Unit, the Sensors did not detect a Banknote present condition when the time interval was too long, or the pulse number is greater than specified value for the function. [Solution] Check that the following parts are properly assembled and/or Harness connected. Clean or adjust the following parts and Sensors. [Relative Parts] Entrance Sensor, Centering Timing Sensor, Validation Sensor, PB Entrance Sensor, Exit Sensor, Feed Motor, Feed Motor Encoder. If the error is not resolved, change the above related part or parts and calibrate the unit.

9 UNIT DIMENSIONS

ENTIRE UNIT OUTSIDE DIMENSIONS

Figure 35 illustrates the DBV-500 Unit's Entire Outside Dimensions.
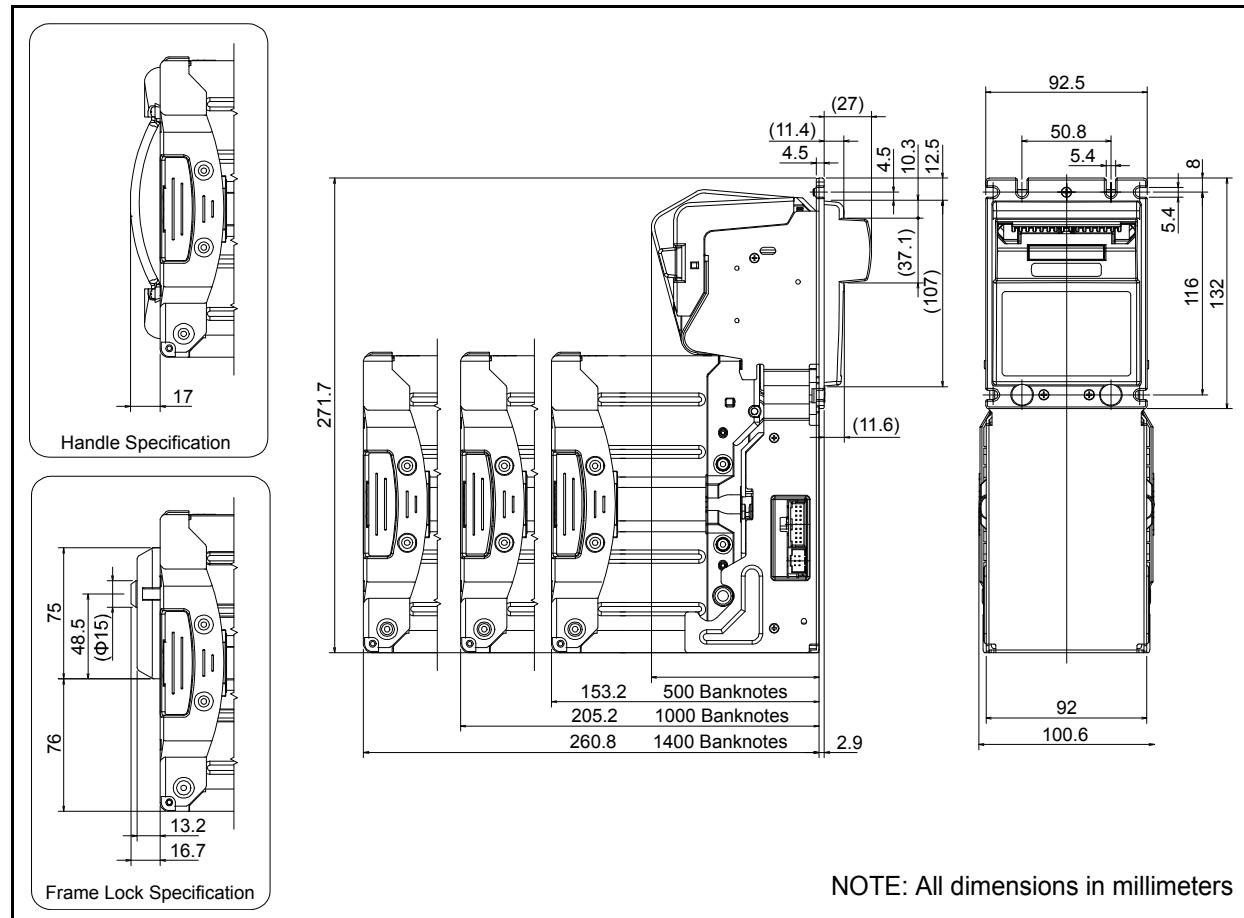
Figure 35 DBV-500 Unit Entire Outside Dimensions

BEZEL TYPE1 DIMENSIONS

Figure 36 illustrates the DBV-500 Bezel Type1 Outside Dimensions.
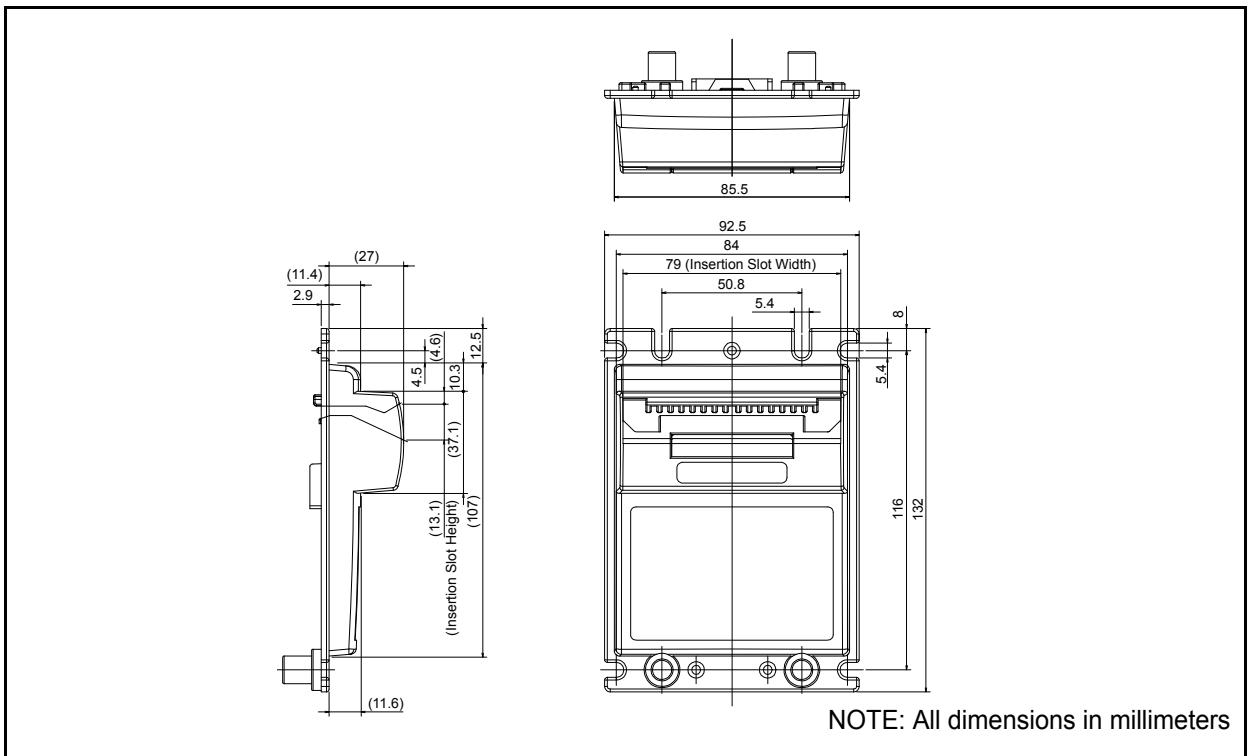
Figure 36 DBV-500 Bezel Type1 Outside Dimensions

BEZEL TYPE2 DIMENSIONS

Figure 37 illustrates the DBV-500 Bezel Type2 Outside Dimensions.
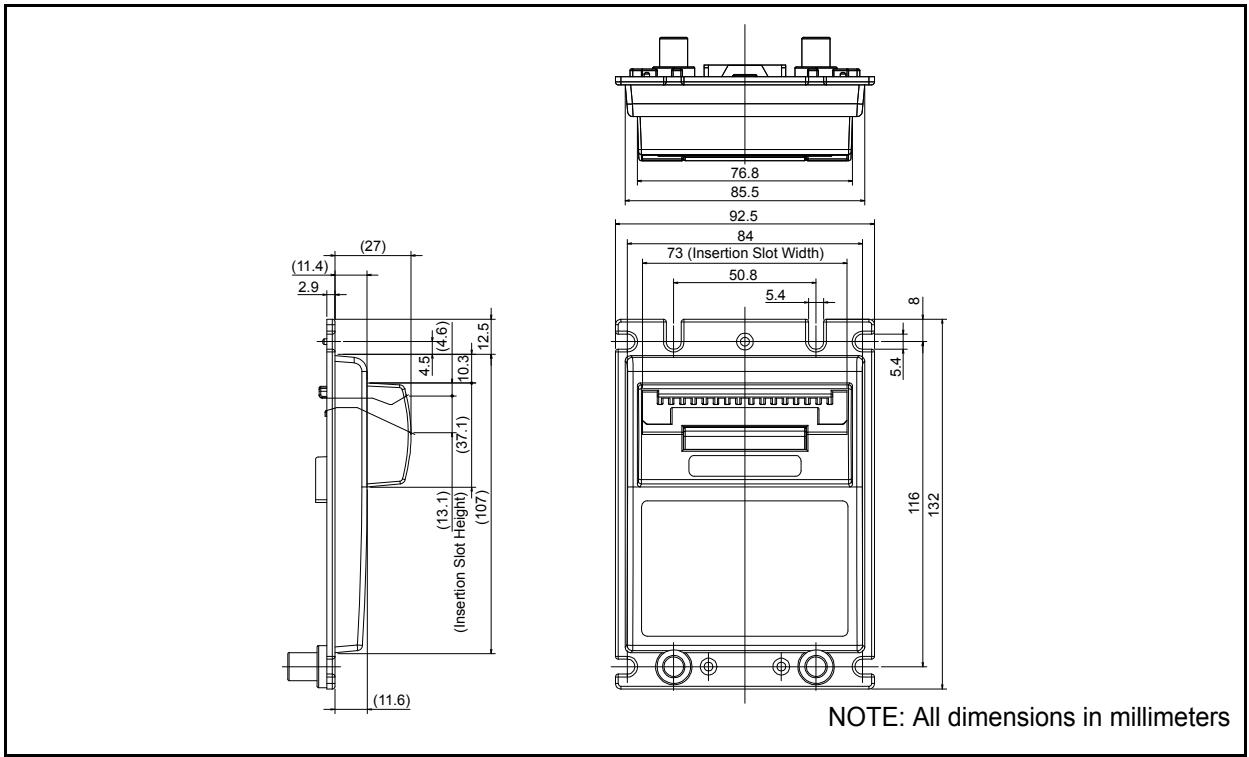
Figure 37 DBV-500 Bezel Type2 Outside Dimensions

DBV-500 Installation/Maintenance Space Requirements

Figure 38 illustrates the DBV-500 installation and maintenance space requirement.

Maximum Opening Angle 178º

173

9

(41)

(45.3)

Interface Connector Harness Performance Space

6 (Min.)

Necessary Dimension to seat/remove the Cash Box

14 (Min.)

NOTE: All dimensions in millimeters
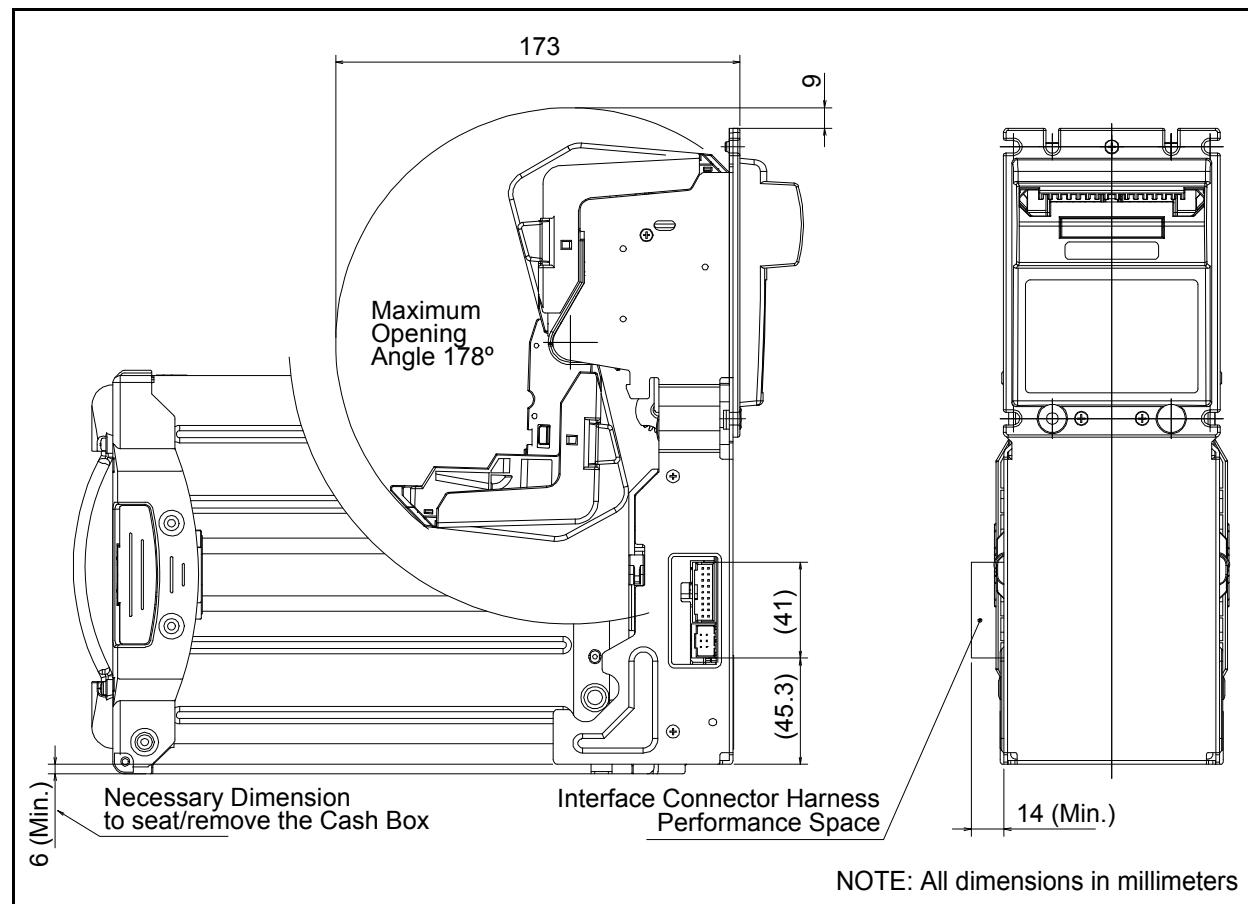
Figure 38 DBV-500 Installation and Maintenance Space Requirement

10 TECHNICAL CONTACT INFORMATION

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 http://www.jcmglobal.com

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