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Installation Guide

Optipay® BV Series

DBV-300 / DBV-301 / DBV-302 Bill Validators

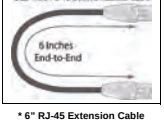
This document contains information for installing and configuring the Optipay® DBV-30X Series Bill Validators. All three units are designed to work in systems where quick, quiet and reliable bill acceptance and validation is required. In addition to easy changeability and multi-sized Cash Boxes, the DBV-300, DBV-301 and DBV-302 contain the following features:

- $1, $5, $10, $20, $50 and $100 bill (banknote) acceptance capable
- 4-Way bill/banknote acceptance with high security
- Coupon acceptance capable (Magnetic & Barcode)
- Utilizes magnetic and multi-wave length sensors for accurate validation
- Color LED indicators for simple fault diagnostics
- Flash memory programming via Palm Pilot® PDA or PC base station
- Available in both Stack-Up (SU) and Stack-Down (SD) model configurations
- Includes a Bottle Mask or Snack Mask Front Bezel.

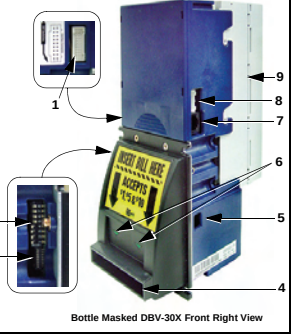
PRIMARY OPTIPAY™ BV BILL VALIDATOR SERIES COMPONENTS

Figure 1 illustrates the primary components of a Bottle Mask Fitted DBV-30X.

1. 18-Pin Molex connector (on left side).
2. Large/Red DIP Switch Block (on left side).
3. Small/White DIP Switch Block (on left side).
4. Bill inserting/dispensing slot.
5. PCB Edge Connector (Presently unused).
6. LED indicators.
7. 8-pin RJ-45 Interface port for Palm Pilot® handheld use (on right side) * Required cable shown below.
8. RC-10 recycler communication Port (on right side).
9. Cash Box (at rear).



* 6" RJ-45 Extension Cable

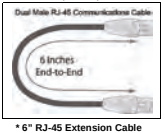


Bottle Masked DBV-30X Front Right View

Figure 1 Primary Bottle Mask Fitted DBV-30X Component Parts

Figure 2 illustrates the primary components of a Snack Mask Fitted DBV-30X.

1. 18-Pin Molex connector (on left side)
2. Large/Red DIP Switch Block (on left side)
3. Small/White DIP Switch Block (on left side)
4. Bill inserting/dispensing slot
5. PCB Edge Connector (Presently unused)
6. LED indicators
7. 8-pin RJ-45 Interface port for Palm Pilot® handheld use (on right side) * Required cable shown below.
8. RC-10 recycler communication Port (on right side)
9. Cash Box (at rear)



* 6" RJ-45 Extension Cable

Snack Masked DBV-30X Front Right View

Figure 2 Primary Snack Mask Fitted DBV-30X Component Parts

INSTALLATION PROCESS

During the installation process, access to the four (4) mounting holes will be easier if the Cash Box and Lower Sensor Assembly are removed prior to installation. To remove these assemblies proceed as follows:

CASH BOX

1. Slide the white release tab located on top of the Validator forward (See Figure 3) and
2. Pull the Cash Box up and out to remove it.

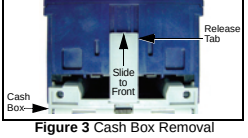


Figure 3 Cash Box Removal

SENSOR MODULE

1. To remove the Lower Sensor Assembly, press up [1] on the release rod locking bar and
2. Pull the module outward [2] from the frame (See Figure 4).

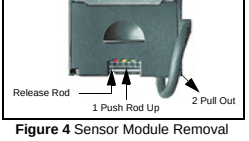


Figure 4 Sensor Module Removal

OPERATIONAL CHECK

Once the unit is installed, perform the following steps to ensure the DBV-300, 301 or 302 is communicating with the Host Machine's Bus.

1. Power up the unit.
2. Wait for the LEDs on the front panel to stop flashing. When the LEDs are solid the unit is in its operational mode.
3. Insert a bill, and verify that the Host Machine displays an approprate value for th bill inserted and/or performs the desired vend function.

If further detailed instruction is necessary, refer to the primary DBV-30X Service Manual (Part No. 960-000103R).

BILL ACCEPTANCE TESTS

The Bill Acceptance Test provides a quick and easy way to check the basic operation of the DBV-30X Bill Validator. While in the Bill Acceptance Mode, the DBV will accept, validate, and stack bills in the Cash Box. The LEDs on the front bezel of the unit will flash to indicate the denomination of bills inserted.

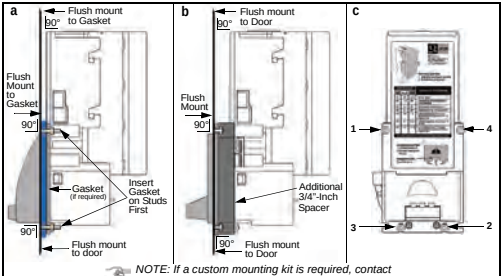
To run the Bill Acceptance Test, place the DBV into the Test Mode as follows:

1. Remove any power that is currently applied to the DBV.
2. On DIP Switch Block #1, set SW-8 to the "ON" position.
3. Reapply all power to the DBV.
4. Verify that the Diagnostic LEDs (Red - Yellow - Green) are all steady lit, and that the Bezel LEDs are also lit. The DBV is now in 'Test Mode'.
5. On DIP Switch Block #1, set SW-1, SW-2, SW-3, and SW-4 to "ON".
6. On DIP Switch Block #1, set SW-8 to "OFF". (this enables the test).
   The DBV is now ready to accept bills.
7. Insert a variety of bills as desired.
   The Front Bezel LEDs will flash to indicate the bill denomination inserted as follows:
   - 1 Flash = $1.00
   - 2 Flashes = $5.00
   - 3 Flashes = $10.00
   - 4 Flashes = $20.00
8. When done testing, perform the following steps to return the DBV to normal operating mode:
9. On DIP Switch Block #1, set SW-8 to "ON". (this disables the test).
10. On DIP Switch Block #1, set SW-1, SW-2, SW-3, and SW-4 to "OFF".
11. On DIP Switch Block #1, set SW-8 to "OFF".
12. Recycle power to the unit.

MOUNTING INSTRUCTIONS

Caution: Turn the equipment power OFF before removing or replacing any components.

The DBV-30X Series Validators work best when flush mounted in a vertical position. A properly mounted Bottle Masked Validator is illustrated in Figure 5a. A properly mounted Snack Masked Validator is illustrated in Figure 5b. This configuration initially offsets the unit 3/4" back from the mounting surface using spacer as illustrated in Figure 5b.
Install the Bill Validator using the four (4) mounting access holes provided and tighten the four (4) mounting nuts in the order illustrated in Figure 5c.



NOTE: If a custom mounting kit is required, contact the individual Vendors JCM installation guide.

Figure 5 Bottle & Snack Mask Mounting Considerations

Caution: Tighten mounting nuts until snug. DO NOT over tighten.

DBV-300 POWER SUPPLY CONNECTIONS

The DBV-300 requires a customer supplied +12V DC Power supply. Power consumption is 0.3 Amps in Stand-by Mode and 0.6 Amps in normal operation. However, the maximum current draw is nominally 1.5 Amps.
JCM recommends using a power source capable of supplying +12V DC (±5%) at 2.5 Amps.
If the Bill Validator came with a pre-wired interface harness, connect the 12 Volt Power Source to Wire 3 (power) and Wire 4 (power return) of the 18-Pin Harness Connector, and then connect it to the 18-Pin Interface Receptacle located on the left side of the Bill Validator.
If a pre-wired harness is not being used, connect the 12 Volt Power Source directly to pins 3 and 4 of the 18-Pin Interface Receptacle located on the left side of the Bill Validator.
Figure 6 illustrates the DBV-300 Power Input Port Pin Configuration.

Vdd @ Pin #3 = +12Volt DC Power
Vss @ Pin #4 = +12Volt DC Ground

Figure 6 DBV-300 Power Input Port Pin Configurations

DBV-301 POWER SUPPLY CONNECTIONS

The DBV-301 requires a customer supplied +24V DC Power supply. Power consumption is 0.2 Amps in Stand-by Mode and 0.4 Amps in normal operation. However, the maximum current draw is nominally 0.9 Amps.
JCM recommends using a power source capable of supplying +24V DC (±5%) at 2.5 Amps.
If the Bill Validator came with a pre-wired interface harness, connect the 24 Volt Power Source to Wire 1 (power) and Wire 2 (power return) of the 18-Pin Harness Connector, and then connect it to the 18-Pin Interface Receptacle located on the left side of the Bill Validator.
If a pre-wired harness is not being used, connect the 24 Volt Power Source directly to pins 1 and 2 of the 18-Pin Interface Receptacle located on the left side of the Bill Validator.
Figure 7 illustrates the DBV-301 Power Input Port Pin Configuration.

Vdd @ Pin #1 = +24Volt DC Power
Vss @ Pin #2 = +24Volt DC Ground

Figure 7 DBV-301 Power Input Port Pin Configurations

DIAGNOSTICS

The DBV-30X series of Bill Validators contain intelligent tri-colored (3 way) Diagnostic LED Panel (See Figure 16).

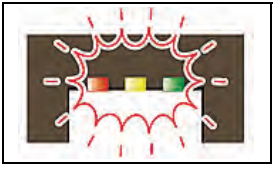
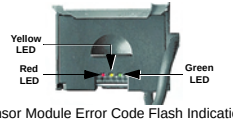


Figure 16 DBV-30X Tri-colored LED Panel

The LED Panel is located on the Lower Sensor Assembly (See Figure 17), and provide an aid when troubleshooting. During normal operation, the Green LED will be lit. The LEDs will flash when an error condition exists. The number of times an LEDs flashes depends on the type of error encountered. Figure 17 lists the LED Error Code flash definitions. For more detailed help in troubleshooting operational problems, refer to the DBV-30X Operating and Maintenance Manual (Part No. 960-000103R).
The Figure 17 Table lists the DBV-300 & 302 LED Error Code flash definitions.



Sensor Module Error Code Flash Indications

Number of Flashes			Diagnostic Description
Red	Yellow	Green	
OFF	OFF	SOLID	DBV / OK / READY
OFF	1	OFF	CASH BOX FULL / CHECK CASH BOX
2	OFF	OFF	STACKER ERROR / CHECK CASH BOX
OFF	3-4	OFF	NOTE JAMMED / CHECK NOTE PATH
OFF	10	OFF	CASH BOX POSITION / CHECK CASH BOX
OFF	OFF	1-8	LAST NOTE REJECTED / IF PROBLEM PERSISTS EITHER CLEAN NOTE PATH OR CONTACT JCM
OFF	OFF	9-10	LAST NOTE INHIBITED / REJECTED BY DBV OR HOST
OFF	OFF	11-15	LAST NOTE REJECTED / IF PROBLEM PERSISTS EITHER CLEAN NOTE PATH OR CONTACT JCM

Figure 17 DBV-30X Error Codes

ID-0D3 Photo Coupled MDB Serial Interface

The Multi Drop Bus (MDB) Serial Interface is used for communication and control in a wide variety of Vending Machine equipment and a wide variety of MDB compatible devices. The JCM DBV-301 Bill Validator is well suited for use in this application due to its ability to operate directly from the MDB Bus 24 Volt DC supply voltage. Once installed, the unit communicates with the Vending Machine Controller (VMC) and/or other MDB compatible devices. Input/Output connection terminals for **Photo Coupled MDB** Communications are provided within the 18-Pin Interface Connector located on the left side of the DBV Unit. Table 10 lists the associated signal names and connections terminals for the ID-0D3 MDB Serial Format.

Table 10 Photo Coupled MDB Signal Names and Descriptions

Pin No.	Signal Name	I/O*	Function & Signal Description
1	VDD1		DBV-301 24 VDC Power Terminal (See Figure 7 on page 4)
2	VSS1		DBV-301 24 VDC RTN Power Terminal (See Figure 7 on page 4)
3	NC		No Connection
4	NC		No Connection
5	TXD2	OUT	Photo Coupler Output Signal Line from Bill Acceptor (See Figure 13 on page 10)
6	RXD2	IN	Photo Coupler Input Signal Line from Bill Acceptor (See Figure 13 on page 10)
7	SG2		Photo Coupler Signal Ground from Bill Acceptor (See Figure 13 on page 10)
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	NC		No Connection
16	NC		No Connection
17	NC		No Connection
18	NC		No Connection

* I/O (In/Out) viewed from the Bill Validator side.

DIP Switch Block #2: During normal operation, all switches on DIP Switch Block #2 should be set to "OFF" when using the ID-003 MDB Interface Protocol. If the Firmware version being used is capable of supporting a secondary protocol (as listed in the applicable Software Information Sheet), then DIP Switch #2/Switch 8 may be set to "ON" to properly select it.

DBV-302 POWER SUPPLY CONNECTIONS

The DBV-302 operates directly from a nominal 117V AC alternating current Line Voltage of 50/60 Hertz, and comes pre-wired directly from JCM for this voltage supply.

NOTE: The Power Harness extending from the left side of the DBV-302 terminates in a 9-Pin Molex Connector. In order to connect the required 117V AC to this harness, a JCM power cord adaptor (Part No. 400-100137R) will be required. The required adaptor is illustrated in Figure 8.

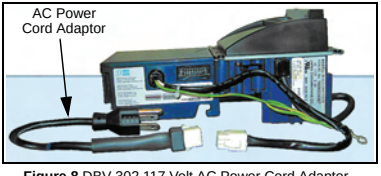
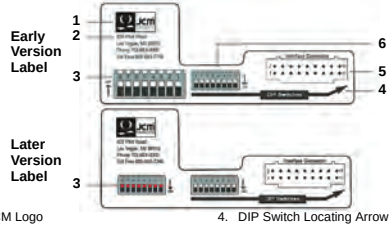


Figure 8 DBV-302 117 Volt AC Power Cord Adaptor

DIP SWITCH LABELS AND SETTINGS

The DBV-30X Bill Validator features two banks of DIP Switches. The switch blocks can be found in a recessed area located on the left side of the DBV directly below the 18-Pin Harness Interface Receptacle. A label affixed to the side of each DBV indicates where the DIP Switches are located, and how each switch is numbered. Figure 9 illustrates the label differences between the early and later version DBV DIP Switch Blocks.



1. JCM Logo
2. JCM Main Office Address
3. Upper DIP Switch Block
4. DIP Switch Locating Arrow
5. Interface Connector Pin Label
6. Lower DIP Switch Block

Figure 9 Early & Later Version DIP Switch Side Label

The switch settings will vary depending on the operating mode presently active, the options selected, and the communication protocol being used.

The DIP Switch located immediately below the 18-Pin Harness Interface Receptacle is **DIP Switch #1**. The DIP Switch located directly below DIP Switch #1 is **DIP Switch #2**.

On early model DBV units, DIP Switch Block #1 is larger in size than DIP Switch Block #2, and is White in color. On later model DBV units the two DIP Switches are the same size and the switches of **DIP Switch #1 are Red in color**. Each DIP Switch Block contains eight (8) individual two position, single pole switches that can be set to either "ON" or "OFF". The switches are numbered from 1 to 8, left to right, upward from the bottom of the DBV Unit. A switch is considered "OFF" when down (towards the DBV front Bezel), and "ON" when up (towards the DBV Cash Box). See Figure 10 for the typical switch layouts.

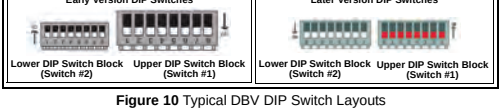


Figure 10 Typical DBV DIP Switch Layouts

Table 9 ID-044 DIP Switch Block #2 Pulse Output Format Settings

Pulse Width	Pulse Count (No. of Pulses)	SW2-1	SW2-2	SW2-3	SW2-4	SW2-8
50 ms / 300 ms	--------	OFF	OFF	---	---	ON
50 ms / 50 ms	--------	ON	OFF	---	---	ON
--------	$1 = 1 Pulse	---	---	OFF	OFF	ON
--------	$1 = 2 Pulse	---	---	ON	OFF	ON
--------	$1 = 3 Pulse	---	---	OFF	ON	ON
--------	$1 = 4 Pulse	---	---	ON	ON	ON

Figure 15 provides the pin connection data for ID-044 Pulse Interface operation.

/Vend @ Pin #11 = Accepted Denomination Signal

/Enable @ Pin #14 = Bill Inhibited (Hi) / Accepted (Low) Signal

/Busy @ Pin #16 = Acceptor Operating Signal

/ABN @ Pin #17 = Acceptor Error Signal

/Full @ Pin #18 = Cash Box Full Signal

Figure 15 DBV-300 ID-044 Pulse Interface Data Pin Configurations

ID-044 Pulse Interface

Input/Output connection terminals for ID-044 Pulse Data Communications are provided within the 18-Pin Interface Connector located on the left side of the DBV Unit. Table 8 lists the associated signal names and connections terminals for the ID-044 Pulse Format.

Table 8 ID-044 Pulse Signal Names and Descriptions

Pin No.	Signal Name	I/O*	Function & Signal Description
1	VDD1		DBV-301 24 VDC Power Terminal (See Figure 7 on page 4)
2	VSS1		DBV-301 24 VDC RTN Power Terminal (See Figure 7 on page 4)
3	VDD1		DBV-300 12 VDC Power Terminal (See Figure 6 on page 4)
4	VSS1		DBV-300 12 VDC RTN Power Terminal (See Figure 6 on page 4)
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	VEND	OUT	Accepted Denomination Signal (Active LO)
12	NC		No Connection
13	NC		No Connection
14	ENABLE	IN	Bill Inhibit (HI) / Accept (LO) Signal (Active LO)
15	NC		No Connection
16	BUSY		Acceptor Operating Signal (Active LO)
17	ABN		Acceptor Error Signal (Active LO)
18	FULL		Cash Box Full Signal (Active LO)

* I/O (In/Out) viewed from the Bill Validator side.

DIP Switch Block #2 is used to select the desired ID-044 **Pulse Width** and **Pulse Count** Output Format type. Table 9 on page 15 lists the related DIP Switch settings for each Pulse format. Further details can be found on the applicable Software Information Sheet available from the JCM Website at: http://www.jcm-american.com/products/software.asp.

DIP Switch Block #1 Settings

During normal operation, the user may opt to enable or disable the acceptance of certain bill denominations. Not all Bill Validators accept every denomination listed. The Operating Firmware installed in your DBV will determine which currency denominations are supported. Denomination selection is accomplished by setting DIP Switch #1 switches to either "ON" or "OFF" according to Table 1.

Table 1 DIP Switch Denomination Settings

Switch No.	Position	DIP Switch Function
SW-1	OFF	Enable Denomination 1 Acceptance
	ON	Disable Denomination 1 Acceptance
SW-2	OFF	Enable Denomination 2 Acceptance
	ON	Disable Denomination 2 Acceptance
SW-3	OFF	Enable Denomination 3 Acceptance
	ON	Disable Denomination 3 Acceptance
SW-4	OFF	Enable Denomination 4 Acceptance
	ON	Disable Denomination 4 Acceptance
SW-5	OFF	Enable Denomination 5 Acceptance
	ON	Disable Denomination 5 Acceptance
SW-6	OFF	Enable Denomination 6 Acceptance
	ON	Disable Denomination 6 Acceptance
SW-7	OFF	Enable Denomination 7 Acceptance
	ON	Disable Denomination 7 Acceptance
SW-8	OFF	Normal Mode
	ON	Test Mode

The Operating Firmware currently installed in the DBV memory will determine which bills are supported, and the switches to which they are assigned.

NOTE: Not all Firmware Loads support every bill denomination currently in circulation! For Example:

A USA2 Firmware Load will support denomination acceptance from $1 through $20, whereas

A USA3 Firmware Load will support denomination acceptance from $1 through $100.

Refer to the applicable Software Information Sheet for DIP Switch setting details relating to your particular currency denomination acceptance.

Switch SW-8 on DIP Switch Block #1 determines whether the DBV operates in 'Normal Mode' or in 'Test Mode'. While in the 'Test Mode', a number of performance and diagnostics tests are available. Refer to the Optipay® DBV-30X Operation and Maintenance Manual (Part No. 960-000103R), or the Optipay® System Quick Reference Guide (Part No. 960-000128R) for details concerning individual performance and diagnostic tests when using this mode.

DIP Switch Block #2 Settings

The switches on the DIP Switch #2 Block are used for selecting several parameters, including whether the DBV is operating in Serial Mode or Pulse Mode, the Pulse Width, and setting the number of Pulse Counts required. Refer to information provided for each Communications Protocol detail outlined on the following pages to determine the correct DIP Switch Block #2 settings for your particular configuration. This information is also available in the Software Information Sheet applicable to the systems specific Firmware Load.

Table 7 ID-002 DIP Switch Block #2 Pulse Output Format Settings

Pulse Width	Pulse Count (No. of Pulses)	SW2-1	SW2-2	SW2-3	SW2-4	SW2-8
50 ms / 300 ms	--------	OFF	OFF	---	---	ON
50 ms / 50 ms	--------	ON	OFF	---	---	ON
80 ms / 120 ms	--------	OFF	ON	---	---	ON
150 ms / 180 ms	--------	ON	ON	---	---	ON
--------	$1 = 1 Pulse	---	---	OFF	OFF	ON
--------	$1 = 4 Pulse	---	---	ON	OFF	ON
--------	$1 = 10 Pulse	---	---	OFF	ON	ON
--------	$1 = 20 Pulse	---	---	ON	ON	ON

Figure 14 provides the pin connection data for ID-002 Pulse Interface operation.

/Vend @ Pin #11 = Accepted Denomination Signal

/Enable @ Pin #14 = Bill Inhibited (Hi) / Accepted (Low) Signal

/Busy @ Pin #16 = Acceptor Operating Signal

/ABN @ Pin #17 = Acceptor Error Signal

/Full @ Pin #18 = Cash Box Full Signal

Figure 14 DBV-300 ID-002 Pulse Interface Data Pin Configurations

ID-002 Pulse Interface

Input/Output connection terminals for ID-002 Pulse Data Communications are provided within the 18-Pin Interface Connector located on the left side of the DBV Unit. Table 6 lists the associated signal names and connections terminals for the ID-002 Pulse Format.

Table 6 ID-002 Pulse Signal Names and Descriptions

Pin No.	Signal Name	I/O*	Function & Signal Description
1	VDD1		DBV-301 24 VDC Power Terminal (See Figure 7 on page 4)
2	VSS1		DBV-301 24 VDC RTN Power Terminal (See Figure 7 on page 4)
3	VDD1		DBV-300 12 VDC Power Terminal (See Figure 6 on page 4)
4	VSS1		DBV-300 12 VDC RTN Power Terminal (See Figure 6 on page 4)
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	VEND	OUT	Accepted Denomination Signal (Active LO)
12	NC		No Connection
13	NC		No Connection
14	ENABLE	IN	Bill Inhibit (HI) / Accept (LO) Signal (Active LO)
15	NC		No Connection
16	BUSY		Acceptor Operating Signal (Active LO)
17	ABN		Acceptor Error Signal (Active LO)
18	FULL		Cash Box Full Signal (Active LO)

* I/O (In/Out) viewed from the Bill Validator side.

DIP Switch Block #2 is used to select the desired ID-002 **Pulse Width** and **Pulse Count** Output Format type. Table 7 on page 13 lists the related DIP Switch settings for each Pulse format. Further details can be found on the applicable Software Information Sheet available from the JCM Website at: http://www.jcm-american.com/products/software.asp.

COMMUNICATION PROTOCOLS

The Operating Firmware loaded into the DBV memory will determine the proper Communication Protocol required for data transfer when communicating with the Host Device. Table 2 lists several of the protocols available to the user.

Table 2 Various Protocol Descriptions

Protocol	Signal Description
ID-003	Bi-Directional Serial Data, RS-232 compatible
ID-002	Uni-Directional Serial Data or Pulse Data
ID-044	Uni-Directional Serial Data or Pulse Data
ID-0D3	Serial Data, MDB compatible, photo coupled

To verify which protocol is currently programmed in a specific DBV, refer to the Silver colored identification label affixed to the bottom left side of the DBV unit below the DIP Switches. The label lists the Model and Serial Number of the DBV Unit and the last two (2) digits of the Model Number identify the communications protocol programmed into the unit. Table 3 lists the digits and their protocol meanings.

Table 3 Model Number Protocol ID Descriptions

Mode No. Last Two Digits	Communications Protocol
03	ID-003 RS-232 Serial
02	ID-002 Serial or Pulse
44	ID-044 Serial or Pulse
D3	ID-0D3 MDB Serial

The Communications Protocol, as well as the specific Software Version programed into the DBV can also be identified on the White colored Software Label located directly above the Silver colored Model Number Label on the left side of the DBV Unit. The Version Number corresponds directly to an applicable Software Information Sheet. Software Information Sheets can be viewed and downloaded from the Product Support Section of the JCM Website at: http://www.jcm-american.com/products/software.asp.

Depending on the Communications Protocol being used, signal connections and DIP Switch settings will vary. If the DBV purchased came with a pre-wired cable harness:

- Connect one end of the pre-wired cable to the 18-Pin Interface Connector located on the left side of the DBV Unit directly above the DIP Switches, and
- Connect the opposite end to the Host Device.

For specific information concerning DBV electrical connections, signal names, and required DIP Switch Settings, refer to the applicable Communications Protocols described on the pages of this document.

ID-003 SERIAL INTERFACE

Input/Output connection terminals for Serial Data Communications are provided within the 18-Pin Interface Connector located on the left side of the DBV Unit. Serial Data is available in the following three (3) forms:

1. RS-232
2. TTL and
3. Photo Coupled.

Table 4 lists the associated signal names and connections terminals for the ID-003 Serial format.

Table 4 ID-003 Serial Signal Names and Descriptions

Pin No.	Signal Name	I/O*	Function & Signal Description
1	VDD1		DBV-301 24 VDC Power Terminal (See Figure 7 on page 4)
2	VSS1		DBV-301 24 VDC RTN Power Terminal (See Figure 7 on page 4)
3	VDD1		DBV-300 12 VDC Power Terminal (See Figure 6 on page 4)
4	VSS1		DBV-300 12 VDC RTN Power Terminal (See Figure 6 on page 4)
5	TXD2	OUT	Photo Coupler Output Signal Line from Bill Acceptor (See Figure 13 on page 11)
6	RXD2	IN	Photo Coupler Input Signal Line from Bill Acceptor (See Figure 13 on page 11)
7	SG2		Photo Coupler Signal Ground from Bill Acceptor (See Figure 13 on page 11)
8	TXD1	OUT	RS-232C Output Signal Line from Bill Acceptor (See Figure 11 on page 11)
9	RXD1	IN	RS-232C Input Signal Line from Bill Acceptor (See Figure 11 on page 11)
10	SG1		RS-232C & TTL Signal Ground from Bill Acceptor (See Figure 11 on page 11)
11	TXD0	OUT	TTL Output Signal Line from Bill Acceptor (See Figure 12 on page 11)
12	RXD0	IN	TTL Input Signal Line from Bill Acceptor (See Figure 12 on page 11)
13	NC		No Connection
14	NC		No Connection
15	NC		No Connection
16	NC		No Connection
17	NC		No Connection
18	NC		No Connection

* I/O (In/Out) viewed from the Bill Validator side.

DIP Switch Block #2 is used to select the desired **Serial Data** Output Format type. Table 5 lists the related DIP Switch settings for each Serial format. Further details can be found on the applicable Software Information Sheet available from the JCM Website at: http://www.jcm-american.com/products/software.asp.

Table 5 DIP Switch Block #2 Serial Output Format Settings

Serial Format	I/O Pins	SW2-1	SW2-2	SW2-8
RS-232C	8, 9, 10	OFF	ON	OFF
TTL	11, 12, 10	ON	OFF	OFF
Photo Coupled	5, 6, 7	OFF	OFF	OFF

RS-232 Serial Data:

Figure 11 provides the pin connection data for RS-232C Serial operation.

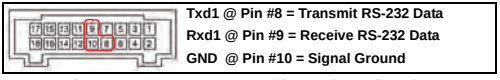


Figure 11 DBV-30X RS232C Serial Data Pin Configurations

To enable the RS-232C output, set the DBV Block #2 DIP Switches as follows:

- Set DIP Switch Block SW1 to "OFF", SW2 to "ON" and SW8 to "OFF".

TTL Level Interface:

Figure 12 provides the pin connection data for TTL Level operation.

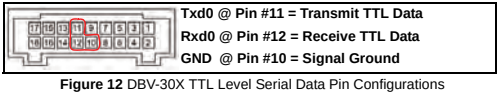


Figure 12 DBV-30X TTL Level Serial Data Pin Configurations

To enable TTL Serial output, set the DBV Block #2 DIP Switches as follows:

- Set DIP Switch Block SW1 to "ON", SW2 to "OFF". and SW8 to "OFF".

Photo Coupler Isolated Interface:

Figure 13 provides the pin connection data for Photo-Coupler Isolated operation.

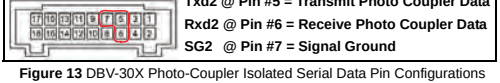


Figure 13 DBV-30X Photo-Coupler Isolated Serial Data Pin Configurations

To enable Photo Coupled output, set the DBV Block #2 DIP Switches as follows:

- Set DIP Switch Block SW1 to "OFF"; SW2 to "OFF", and SW8 to "OFF".