Operation Manual

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Technical Specifications

The *Vector* line of bill validators accepts bank notes and coupons thru 72 mm in width. The Vector comes pre-programmed, per customer specification, from the factory or can be reconfigured by customers utilizing the *Vector Tools* program for PDA or PC's. Software updates can also be uploaded into the *Vector* via a PDA or PC enabled with the *Vector Tools* program.

Operating Voltage:	12 VDC +/- 10% 34 VDC MDB I/F 117/220 VAC Optional	***Operating Current***:	Idle: 140 mA Accepting: 500 mA Stalled: 1.1 A
Operating Temp:	0C – 60C (32F – 140F) RH 90% non-condensing	***Notes Accepted***:	Up to 20 Denominations
Note Orientation:	Four (4) Directions	***Interface Options***:	Pulse, Parallel, Serial, 'True' RS232, CC-Talk, USB. (*Custom interfaces available upon request*)
Sensor Suite:	Optical, UV as standard Magnetic sensor optional	***I/O Ports***:	16 Pos Mating Connector RS232 Jack for PDA (Diagnostic/Software Uploads)
Mounting:	Can be mounted at any angle from center.	***Cashbox Options***:	250, 600, 1000 (locking option 600/1000)
Net Weight:	*1*.5 lbs, 0.68 Kg	***Currency Range***:	Notes 60 mm thru 85mm in width.
Validation Options:	Coupons, *(Refer to manual VTICBC-1 for additional detail)*	***Warranty***:	2 Years Parts and Labor *Refer to page 14 for warranty detail)*
Acceptance Speed:	Approx. 22 notes/min.		

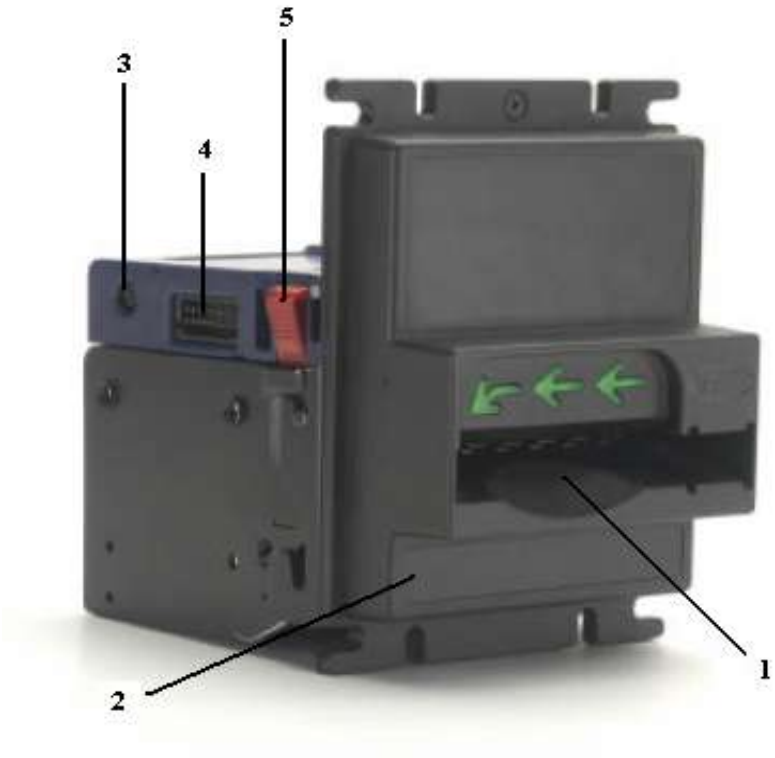
ESD Precautions

The Vector bill acceptor is used as an inside component of a vending machine or similar host machine. Proper grounding is conducted by connecting the Vector metal mounting bracket to the metal surface of the vending machine chassis.

To minimize electrostatic discharge, observe the following precautions:

- When removing Vector from an antistatic bag, or the vending machine cabinet, lay it on an antistatic surface such as a ESD mat or a disposable antistatic mat.
- Always wear an antistatic wrist strap connected to metal surface on the chassis of the vending machine (ground) when working on Vector.
- Do not touch the I/O ports by hands.
- Do not disassemble the unit.

Product Detail



1. Note Entry Area
2. Mounting Bracket/Bezel
3. Data Port
4. I/O Port
5. Upper section release button

Cleaning & Maintenance

The *Vector* currency validator was designed and manufactured for simple, trouble free operation.

To enhance the long term reliability of your *Vector* validator, please follow the simple, but important cleaning and maintenance guide.

Cleaning

We recommend a regular cleaning schedule for your Vector bill validator. Depending on local environmental and usage, the *Vector* should be cleaned at least every 3 months, more regularly in areas of high dust and contamination. The *Vector* utilizes a combination of IR, UV and/or Magnetic sensors along the note path to collect data off the bank note. During use, dust, contamination and foreign objects can collect along the note path and over the sensors, degrading their performance over time. Cleaning your *Vector* on a regular basis will assure maximum performance and validation rates.

On-site cleaning

We realize that it may be impossible for you to remove your *Vector* out of its application while in the field to perform a thorough cleaning. In these instances, we recommend that you obtain a can of *compressed air* and guide the output toward the note entry area. This will remove any excess dust or foreign objects that may have collected over the sensors located along the note path.

Thorough Cleaning

To perform a more thorough cleaning of the Vector, open the upper section by pressing on the two red release buttons and lift gently (for further detail, refer to page 4 of this manual). This allows access to the note path. We recommend that you use a mild soap/water combination and damp, dust free towel and wipe the note path area and sensors. NB do not put the water directly on to the validator, only on to the cloth. Dry thoroughly and close the upper section. DO NOT USE ALCOHOL to clean your Vector as this will degrade the sensor apertures and drive belts and will seriously affect the long term reliability.

Maintenance

The Vector was designed to provide you with simple, trouble free operation. By keeping your Vector clean, you should enjoy many years of trouble free use. If on rare occasion an issue may arise, please refer to the Matrix*Tools (mFlash)* program for PDA/PC and run the diagnostic section of the program to troubleshoot your unit. Also, refer to the rear diagnostic LED on the Vector. If the LED is flashing, refer to the diagnostic card on the top of the unit to detail the possible problem. If you cannot rectify a problem on site, please contact your local service center or VTI.

Interface Descriptions

Interface Switching Mode.

This feature is enabled only when the Vector or Matrix is set to one of the following interfaces;
Pulse / Parallel / Parallel binary.
It is useful if the user has a number of machines in the field using the different interface types. If the Vector is set to any of the serial interfaces, then this feature does not function.

1) Before starting, the Vector must be powered up and in normal condition.
2) Press pushbutton 5 times.
3) Pause.
4) Status LED will turn Green and Orange alternately.
5) Press pushbutton the required number of times to select desired interface (see Table 1).
6) Pause.
7) LED will flash back the number you entered.
8) If incorrect, re-enter the correct number using the pushbutton. Return to step 6.
9) Vector updates and resets itself.

The process will timeout if no input is made.
The pushbutton action should be quick and regular. If the time between consecutive presses is longer than one second, the number input will fall back to 1.

If changing from Parallel or Parallel Binary to Pulse interface, then the default pulse settings will be used. If you wish to use this mode then the all three of interface types options should be set up with mFlash

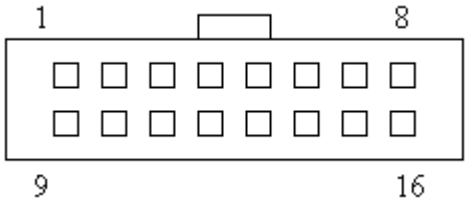
Table 1

Interface	Number of presses
Pulse	1
Parallel	2
Parallel binary	3

Pulse Interface: The *Pulse* Interface provides a corresponding signal on the output line that designates the particular note validated.

IF Cable: VA-WIRA06
Input Power: 12 VDC

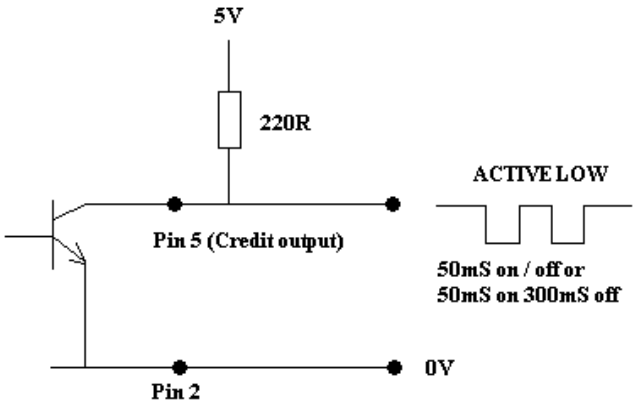
Connector Viewed Facing Validator



Pin 1:	+12 VDC
Pin 2:	Ground/Earth (power)
Pin 4:	Credit Pulse Output (open collector to Ground/Earth)
Pin 5:	Alarm Output (open collector to Ground/Earth)
Pin 6:	Enable Input (tied to Ground/Earth to enable validator)
Pin 12:	Busy (open collector to Ground/Earth. Active LOW when busy)

Pulse Interface continued:

Pulse Output circuit showing pull up to 5VDC



Pulses/Denomination: Factory set per customer specification or via PDA utilizing *Vector Tools or mFlash*.

Pulse Output Rate: High: 50 msec ON/50 msec OFF
Low: 50 msec ON/300 msec OFF

Always Enabled: The Vector can be configured to ignore the enable input status and operate *always enabled*.

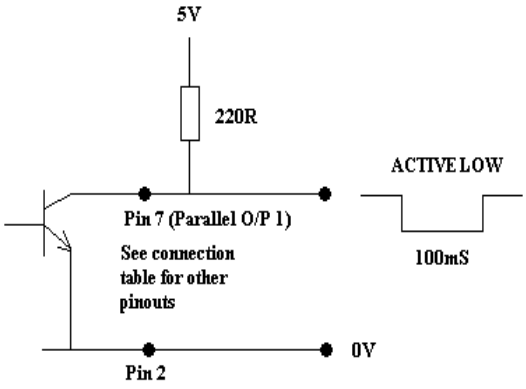
Parallel Interface:

The Parallel interface provides specific output lines for designating which note has been validated. This interface also provides for escrow and alarm functions. Outputs are open collector and can sink up to 100mA at up to 24VDC. Inputs are TTL Default setting for the outputs is active low, it is possible to set them to operate active high with the mFlash configuration software

Pin 1:	+12 VDC
Pin 2:	Ground/Earth (power)
Pin 3:	Vend Line 5 (open collector to Ground/Earth)
Pin 4:	Vend Line 6(open collector to Ground/Earth)
Pin 5:	Alarm Output (open collector to Ground/Earth. Prog. Logic)
Pin 6:	Enable Input (TTL input tie to Ground/Earth to enable validator)
Pin 7:	Vend Line 1 (open collector to Ground/Earth)
Pin 8:	Vend Line 2 (open collector to Ground/Earth)
Pin 9:	Vend Line 3 (open collector to Ground/Earth)
Pin 10:	Vend Line 4 (open collector to Ground/Earth)
Pin 11:	Escrow Line (TTL input)
Pin 12:	Busy Line (open collector to Ground/Earth) Low when the validator is processing currency

Parallel Interface continued:

Vend output circuit showing pull up to 5VDC



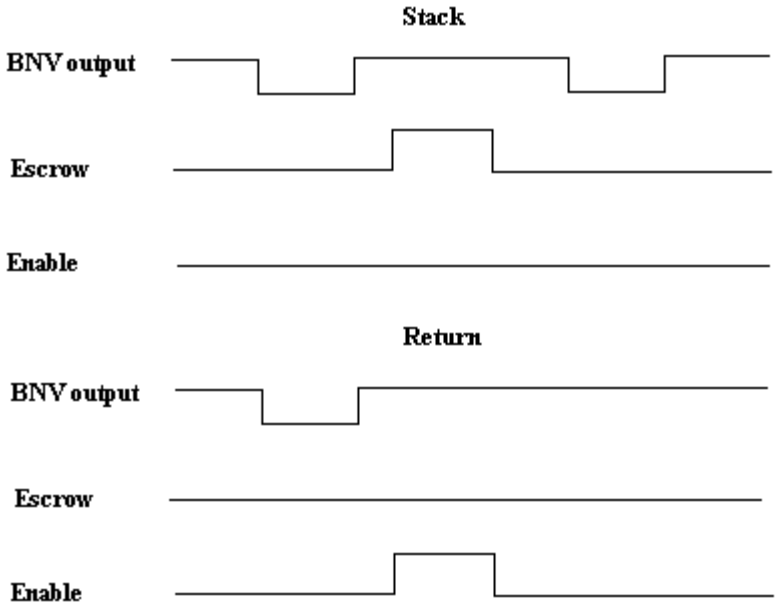
Escrow

This mode allows 'on the fly' enabling and disabling of each denomination accepted by the bill validator. The enable and escrow lines are used in combination to allow this.

The procedure for accept and return is as follows;

1. Enable line and Escrow line are held low (0V) by the host machine.On insertion of a valid bill, the bill validator outputs the relevant pulse i.e. EUR 5. and holds the bill.
2. The host machine now has 25 seconds to accept or return this bill.
3. If the host machine wishes to accept the bill, then the escrow line should go high for at least 100mS (stack command), the bill acceptor will stack the bill and will issue a second output to confirm. This second output is the same as the first.
4. If the host machine wishes to return the bill, then the enable line should go high for at least 100mS (Return command). The bill validator will return the bill held in escrow to the customer.
5. If no action is taken within the time limit, then the bill will be returned to the customer.

Escrow timing diagram



Parallel Binary Interface:

This interface utilises the first four of the Parallel outputs. Instead of a single pulse on each line to denote a particular denomination as in the Parallel interface, the Parallel Binary credit information is sent as a low going output pulse (100mS) which is sent simultaneously on the required lines. This gives a maximum of 15 different denominations. The output is determined by the inserted denomination and are generally given in ascending order of value from lowest to highest . Please see Table 1 for details.

All inputs and other functions such as Escrow, busy etc. are as per the Parallel interface.

Table 1

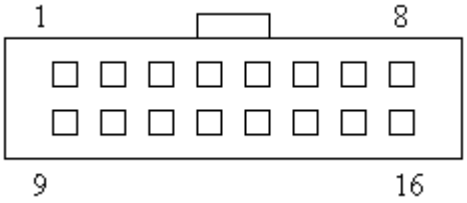
Denomination	***Output 1 pin 7***	***Output 2 pin 8***	***Output 3 pin 9***	***Output 4 pin 10***
1 i.e EUR 5	**1**	**0**	**0**	**0**
2 i.e. EUR 10	**0**	**1**	**0**	**0**
3 i.e. EUR 20	**1**	**1**	**0**	**0**
4 i.e. EUR 50	**0**	**0**	**1**	**0**
5 i.e. EUR 100	**1**	**0**	**1**	**0**
6	**0**	**1**	**1**	**0**
7	**1**	**1**	**1**	**0**
8	**0**	**0**	**0**	**1**
9	**1**	**0**	**0**	**1**
10	**0**	**1**	**0**	**1**
11	**1**	**1**	**0**	**1**
12	**0**	**0**	**1**	**1**
13	**1**	**0**	**1**	**1**
14	**0**	**1**	**1**	**1**
15	**1**	**1**	**1**	**1**

True' RS232:

The 'True' RS232 interface provides for comms between a Host (PC) and Slave (validator). This interface operates at 'True' RS232 levels and allows direct connection between the validator and PC comm. port without the need for special interface harness/loom. 9600 bps, 1 start bit, 1 stop bit, 7 data bit format.

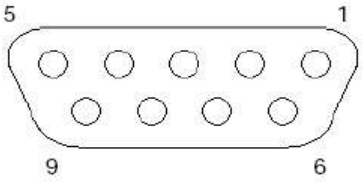
IF Cable: VA-WIRA09
Input Voltage: 12 VDC
Interface Module: VA-PCBA09

Vector Viewing towards validator



Pin 1:	+12 VDC
Pin 2:	Ground/Earth (power)
Pin 14:	RXD (received data validator)
Pin 15:	Common (signal)
Pin 16:	TXD (transmit data validator)

Viewing towards connector (DB9 Female Connector)

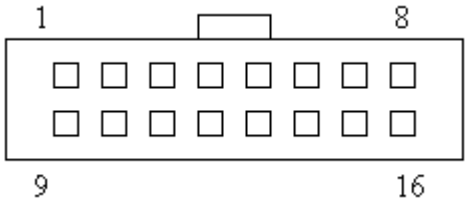


Pin 2:	Host (PC) RXD
Pin 3:	Host (PC) TXD
Pin5:	Common (signal)

TTL RS232: The TTL RS232 interface operates at TTL levels, 9600 bps, 1 start bit, 1 stop bit and 7 data bits.

IF Cable: VA-WIRA06
Input Voltage: +12 VDC

Viewing Towards Validator



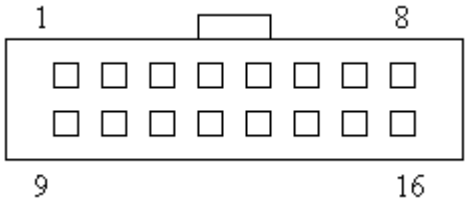
Pin1: +12 VDC
Pin 2: Ground/Earth (power)
Pin14: TTL RXD (receive data to validator)
Pin 15: Common
Pin 16: TTL TXD (transmit data from validator)

For complete technical detail on the RS232 interface protocol, refer to manual VTIRS-x

Serial Interface*:* The Serial interface is a MEI compatible, bi-directional interface. It operates at 600 bps, 1 start bit, 1 stop bit and 8 data bits.

I/F Cable: VA-WIRA06
Input Voltage: 12 VDC

Viewing Towards Acceptor



Pin 1:	+12 VDC
Pin 2	Ground/Earth (power)
Pin 5:	Alarm Output (open collector to Ground/Earth. Programmable Logic)
Pin 6:	Enable Input (tie to Ground/Earth to enable validator)
Pin 7:	Interrupt (request to send data to host)
Pin 12:	Busy (open collector to Ground/Earth, active LOW when busy)
Pin 13:	Send (host ready)
Pin 16:	TXD (transmit data from validator)

For expanded technical information on the Serial Interface, please see manual VTISER-x

ccTalk Interface*:*

Information to be added

USB Interface:

Interface Module: VA-PCBA14

Utilises the standard USB interface for PC. The validator can be connected via a standard USB A to B cable and a 6 pin connector for 12VDC input from the PC power supply

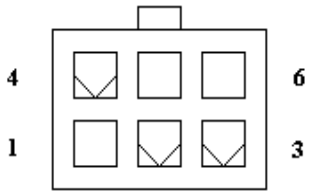
For expanded technical information on the Serial Interface, please see manual VTIUSB-x

MDB Interface:

The Multi Drop Bus (MDB) meets all NAMA standards for functionality. Please refer to the MDB/ICP specification for full protocol details.

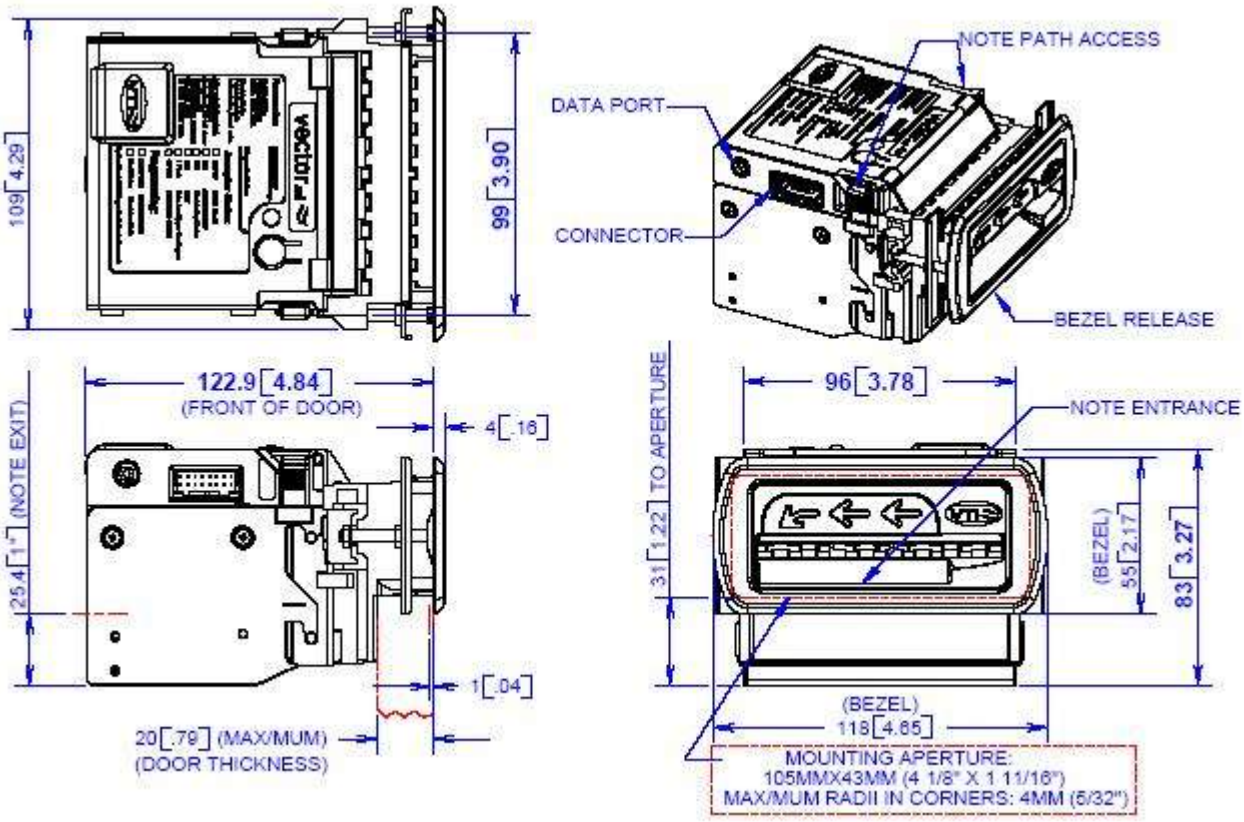
I/F Cable: VA-WIRA04
Input Voltage: 34 VDC (24 – 42 VDC)
Interface Module: VA-PCBA04

Viewing Toward Connector



Pin 1: +34 VDC
Pin 2: Ground/Earth (power)
Pin 4: Master Receive
Pin 5: Master Transmit
Pin 6: Communications Common

Dimensional Detail



Vector with Universal bezel illustrated. For other models please contact your local service centre or VTI.

Software Tools/Manuals

Software Tools

Matrix Tools (mFlash): The *Matrix Tools* program enables your PDA or PC to become a powerful diagnostic tool for your *Vector* validator. *Matrix Tools* allows the following functions…

Advanced Diagnostics
Unit Configuration
Software Uploads

Matrix RSTalk: *Matrix RSTalk* is a Windows Utility program that enables and runs the *Vector* validator while in the RS232 Interface mode. The program can be used to test the *Vector* outside of an application for diagnostic or test purposes.

Matrix USBTalk: *Matrix USBTalk* is a Windows utility program that enables and runs the *Vector* validator while communicating to a Host via the USB port. This program can be used to test the *Vector* outside an application for diagnostic or test purposes.

Matrix Remote: This powerful tool allows a qualified customer to scan bank notes for the purpose of software development.

Manuals

VTIRS-1: RS232 Interface Manual

VTISER-1: Serial Interface Manual

VTIUSB-1: USB Interface Manual

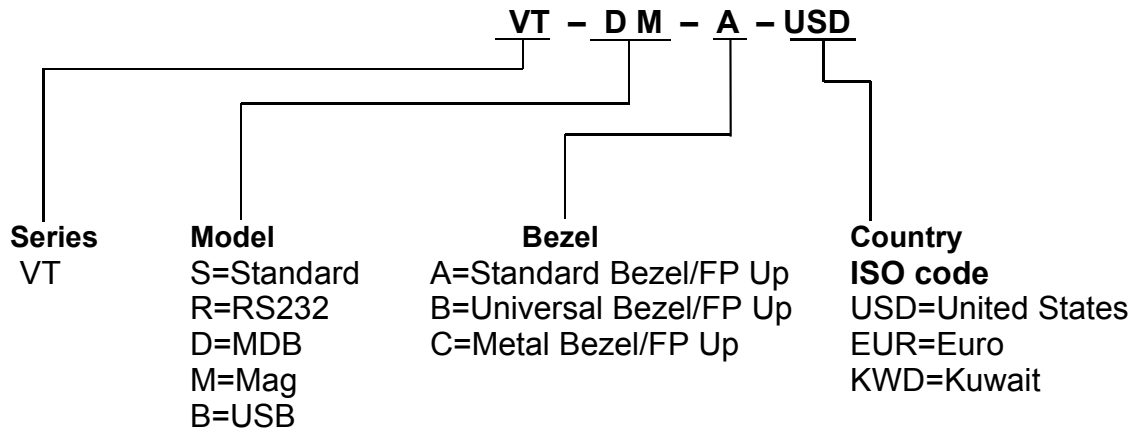
VTITRB-1: Troubleshooting Guide

VTIMR-1: *Matrix Remote* Manual

VTICON-1: *Matrix* Configuration Manual

VTICBC-1: Coupon Specification

Model Number Detail



The Above Example Details the Following Configuration:

VT= Vector
D= MDB I/F
M= Mag Sensor Used
A=Standard Bezel/FP Up
USD= USA Software

Diagnostic Codes

The diagnostic codes for the *Vector* are related to the diagnostic LED found on the top of the *Vector* bill validator. The codes are shown on the second illustration on page 4 of this Manual.

System Reset: Hold Reset/Diagnostic Button Down for 5 Seconds.

Warranty Information

Limited Warranty

The *Vector* bill validator is warranted for a period of two (2) years from date of manufacture. The warranty extends to the original owner and each transferee owner of the product during the two (2) year warranty period. During this two (2) year warranty period, manufacturer or authorized service center will repair or replace (at manufacturer's option) and parts, up to and including the complete validator, which may fail to function properly due to defects in material or workmanship.

The manufacturer is not responsible for any consequential damage or performance degradation that results from counterfeit currency or foreign objects inserted into the validator. The product to be repaired under warranty must be delivered, inbound freight prepaid to an authorized service center. Upon request, the owner must show proof of purchase when submitting validator for service during the warranty period. Repair and installation at the owner's location is not included in the warranty. During the warranty period, manufacturer will pay all outbound 'ground freight' charges to the owner's location. Special handling or shipping charges will be assumed by the owner. Manufacturer will not be liable for any consequential damage as a result of defects in the material or workmanship. Any written or applied warranty of this product is strictly limited to the refund of the cost of goods purchased. Damage due to negligence, accidents, electrical overload, misuse, abuse, vandalism or act of God, are not covered by this warranty. Any alteration of the product after manufacture voids the warranty in entirety.

Shipping Damage: Manufacture cannot be responsible for damage due to damage in the course of shipping. Please unpack and inspect your package and report and damage and file a claim within 72 hours of receipt.

Service: Contact authorized service center or manufacturer when returning product for repair. Please have the following information at hand; Customer Name, Serial Number of unit. You will be given a Return Authorization Number (RMA) that must be CLEARLY included on package and/or shipping documentation. We cannot accept any shipment nor begin repair without this RMA number. Manufacturer accepts no responsibility for any return without RMA.