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XE Validator
Operational Manual

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ABOUT THIS MANUAL

This manual will enable the operator to complete basic maintenance, identify error codes, and perform basic troubleshooting.

A diagram of the validator dimensions is provided to assist operators in customizing the validator to individual needs.

There are no user serviceable parts inside the validator. Further technical assistance can be obtained by calling (800) 837-5561 or (419) 867-4858.

When calling for service, it is important to have the model and serial number readily available. Please take the time to record this number in the space provided.

VALIDATOR MODEL & SERIAL #_____

I. INTRODUCTION

The XE VALIDATOR is an optical reading bill acceptor capable of validating one, five, ten or twenty dollar bills. The XE can also accept the patented Hamilton paper Tokenotes®.

NOTE: Tokenotes® can be interchanged between the HV-X, XE and STA Validators, but CANNOT be interchanged with previous validators. Please include the model and serial number of the validator when ordering Tokenotes®.

FEATURES OF THE XE INCLUDE:

- Bill acceptance in both directions.
- Optical reading of bills.
- Tokenote® acceptance.
- Self-diagnostics.
- The ability to clear jammed bills.
- Operates with a separating stacker in certain changers.
- Automatically detects pulse or serial communications mode.

An upgradeable EPROM allows the software to be updated if new software becomes available.

II. SWITCH SETTINGS

DIP SWITCH SETTINGS		
Switch #	**OFF**	**ON**
1	Normal Operating Mode	Diagnostic Mode
2	Accept Tokenotes	Reject Tokenotes
3	Controller runs Stacker	Validator runs Stacker
4	Not Using Dual Stacker	Dual Stacker Being Used
5	Accepts in Both Directions	Black Seal First
6	For HOPPER type machines # of $1 RELAY pules - 1 for $1 # of $5 RELAY pulses - 1 for $5 2 for $10 4 for $20	For TUBE type machines # of $1 RELAY pulses. 1 pulse per dollar.
7	Accept $1	Reject $1
8	Accept $5	Reject $5
9	Accept $10	Reject $10
10	Accept $20	Reject $20

When programming Tokenotes® with the XE, all switches need to be set to the "ON" position. The switches should be turned "ON" from BOTTOM to TOP, starting with switch #10. When programming is complete, the switches should be turned "OFF" from TOP to BOTTOM, starting with switch #1. This will prevent accidental entry into any diagnostic modes. It is possible to get error codes and total reject by entering certain diagnostic modes. Cycling power will clear this diagnostic mode.

Switch #1: Switch #1 should ALWAYS be in the OFF position. The validator will not function properly otherwise.

Switch #2: Switch #2 should be in the ON position unless the new Hamilton Tokenotes® are being used. If they are being used, this switch should be moved to the OFF posi tion.

When the #2 switch is ON, the validator rejects Tokenotes® already programmed in.

Switch #3: Switch #3 selects the source of stacker control signals when operating in pulse communications mode. In serial communications mode, this switch is ignored. In nearly all situations, this switch should be set to off.

Switch #4: Switch #4 should be in the OFF position unless the Hamilton Dual Stacker is being used.

Switch #5: Switch #5 selects which direction the validator will accept an inserted bill. If this switch is OFF, the validator will accept bills face up in either direction. If this switch is ON, the validator will only accept bills face up and the end with the black seal inserted first.

Switch #6: Switch #6 selects how the validator signals the dispensing equipment after accepting a bill. If this switch is OFF, the validator will activate the $1 Relay once for an accepted $1 bill, the $5 Relay once for an accepted $5 bill, the $5 Relay twice for an accepted $10 bill, and the $5 Relay four times for an accepted $20 bill. If switch #6 is ON, the Validator will activate the $1 Relay once for an accepted $1 bill, the $1 Relay five times for an accepted $5 bill, the $1 Relay ten times for an accepted $10 bill, and the $1 relay twenty times for an accepted $20 bill.

SWITCH #6 DOES NOT WORK WITH TUBE TYPE CHANGERS.

Switch #7: Switch #7 selects whether the validator will accept or reject $1 bills. If the switch is in the OFF position, the validator will accept $1 bills. If the switch is ON, the validator will reject $1 bills.

Switch #8: Switch #8 selects whether the validator will accept or reject $5 bills. If the switch is in the OFF position, the validator will accept $5 bills. If the switch is ON, the validator will reject all $5 bills.

Switch #9: Switch #9 selects whether the Validator will accept or reject $10 bills. If the switch is in the OFF position, the validator will accept $10 bills. If the switch is ON, the validator will reject all $10 bills.

Switch #10: Switch #10 selects whether the Validator will accept or reject $20 bills. If the switch is in the OFF position, the validator will accept $20 bills. If the switch is ON, the validator will reject all $20 bills.

III. ELECTRICAL CONNECTIONS

The electrical connections are made via a 9-pin connector located on the rear panel of the unit.

The following diagram and chart have been included for custom installation.

9-PIN CONNECTOR

EXTERNAL VIEW

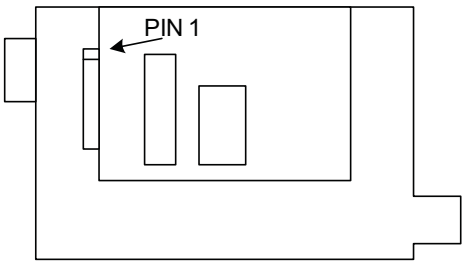
3	2	1
6	5	4
9	8	7

WIRE VIEW

Pin #	Color	Name
1	Blue	Enable
2	White	120VAC Neutral
3	Brown	Vend Common
4	N/A	N/A
5	N/A	N/A
6	Green	Ground
7	White/Blue	$1 Vend Contact Closure
8	White/Brown	$5 Vend Contact Closure
9	Black	120VAC Hot

When used in serial communications mode, serial data and stacker control signals are found on the 9-pin connector of the display board. The following diagram and chart defines the available signals.

Diagnostic Header Pin 1 Location
with Smart Display Board



Pin #	Color	Name
1		DIAG_TXD
2	Brown	COM
3		DIAG_RXD
4		V5.0
5	Pink	SM BUS_+
6	Lt Blue	SM BUS_-
7	Yellow	HOME
8	Black	DOWN
9	Blue	STK_DC

IV. TESTING

After installation, a short test may be performed to verify correct installation.

For testing, be sure switch #1 is OFF. Be sure to test with a quantity of bills.

Test	Desired Result
Turn on unit.	Decimal point flashing.
Insert bill.	Payout proper change for each bill type.

Should this unit fail to operate accordingly, check for an error code and refer to the Troubleshooting section of this manual.

V. MAINTENANCE

MONTHLY - Depending on use

1. The platen assembly should be opened and cleaned regularly.

2. To open the platen assembly:
   - Unplug the changer.
   - Disconnect the 9-pin plug.
   - Remove the validator from the holder.
   - Loosen the 2 thumbscrews on both sides of the validator.
   - Carefully lift to open from the bill insert end of the validator.

3. Clean rollers, heads, belts and sensors with cotton swabs and rubbing alcohol.

4. Close the Platen Assembly and re-tighten the LATCH STUDS. Loose LATCH STUDS may cause false error codes.

YEARLY

The XE Validator should be serviced annually to maintain maximum performance. THIS WORK SHOULD ONLY BE DONE BY A TRAINED TECHNICIAN.

XE Validator Calibrations

To calibrate the optics:

1) Power up the validator.
   *Validator must be in its normal operating position.

2) Turn all switches to the OFF position.

3) Set switches #8 and #1 to the on position
   * Switches must be set in that order
   * A "0" should appear on the display.

4) Take a clean piece of white copier paper and cut it to the size of a bill (test bill).

5) Run it through the validator, it will step through. This will take about 10 seconds.

6) After the test bill is rejected, remove it from the validator. You should end up with a 1 on the display. If it is a "3" the validator needs to be serviced.

7) Turn OFF switches #1 and #8, in that order

8) Now, turn the switches back to their original positions.

9) Optic calibration is complete.

To calibrate the side scans:

1) Power up validator.
   * Validator must be in its normal operating position.

2) Turn all switches to the OFF position.

3) Set switches #6 and # 1 to the ON position. The display will flash a "9" Then count down to a "1".

4) Turn OFF switch #1 a dash "-" will show on the display, wait for the decimal point then turn OFF switch #6.

5) Now, turn the switches back to their original positions.

6) Side scan calibration is complete.

VI. PARTS

PARTS LIST		
Part #	**Description**	**Qty.**
20-0042	BELT	2
46-8594C	XE BILL GUIDE COMPLETE ASSM.	1
46-8592	XE DRIVE BELT	1
48-3007	XE LED HARNESS	1
48-3015	XE POWER HARNESS	1
48-3016	XE SENSOR HARNESS	1
99-0014	HV-STEPPER MOTOR	1
102-0206-XX	PROGRAMMED EPROM	1
104-0000	XE PCB POWER/STEPPER MOTOR ASSM.	1
104-0009	XE SIDESCAN PCB ASSM.	1
104-0052	XE TOP SENSOR PCB ASSM.	1
104-0053	XE BOTTOM SENSOR PCB ASSM.	1
104-0104	MAIN & DISPLAY PCB XE ASSM.	1

VII. ERROR CODES

The XE provides a diagnostic code for most problems. Upon any problem, the error code should be checked first.

The display is only a single digit; therefore, to obtain the 2-digit error code the first digit is displayed WITH THE DECIMAL POINT (5.) and the second digit is displayed WITHOUT THE DECIMAL POINT (3). The display will continue to flash the 2-digit error code; one digit at a time, until the failure is corrected or power is removed.

During normal operation only the decimal point should flash. Do not be concerned if one of the segments flashes once upon power-up or upon passing a valid bill.

The display is only a single digit; therefore, to obtain the 3-digit error code the first digit is displayed WITH THE DECIMAL POINT (5.) and the second and third digits are displayed WITHOUT THE DECIMAL POINT (3) (3). The display will continue to flash the 3-digit error code; one digit at a time, until the failure is corrected or power is removed.

TROUBLESHOOTING

The following troubleshooting guide is for Tokenote® programming errors only.

TROUBLESHOOTING FOR TOKENOTE® PROGRAMMING ERRORS			
ERROR	**PROBLEM**	**POSSIBLE CAUSE**	**POSSIBLE SOLUTION**
3.0 3.1	Tokenote® not found	• Tokenote® is not stored into memory	• Program Tokenote® into memory
3.2	No marker found on Tokenote®	• Weak Tokenote® • Weak mag head signal	• If error continues, return for service with a sampling of Tokenotes®
3.4	Primary < > Secondary	• Primary and secondary Tokenote® signals do not match	• Clear Tokenote® from memory and reprogram • Return for service
3.5	Programming Error		• Run Tokenote® or Training Coupon again.
3.6	12 coupon limit reached	• 12 training coupons have already been stored into memory	• Clear Tokenote® and reprogram with a maximum of 12 training coupons
3.7	Unable to store Tokenote® - "Storage Full"	• Tokenote storage memory is full	• Clear out of memory at least one Tokenote® and then program in new Tokenote®
3.8	Serial ram chip corrupted	• Tokenote® stored, memory has been corrupted • Defective PCB	• Clear all Tokenotes® from memory and reprogram • Return for service

Always note the error code before attempting any service or before contacting the manufacturer.

The following troubleshooting guide is based on standard bill operation. A separate guide for troubleshooting Tokenote® errors is on the previous page.

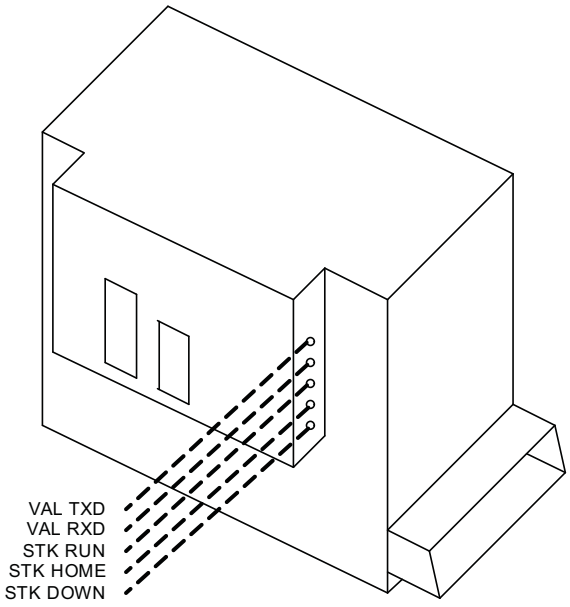
STANDARD BILL OPERATION			
ERROR	**PROBLEM**	**POSSIBLE CAUSES**	**POSSIBLE SOLUTIONS**
0.1	Bill allowed, black seal first only	• Switch 5 is in the on position	
0.2	Bill type turned off	• A bill was inserted that is turned off via switches 7,8,9 or 10	
0.3	All bill types disabled	• Switches for all bill types are set to the on position	• Turn switches off for types of bills to be accepted
0.4	All bill types and Tokenotes disabled	• Switches for all bill types are set to the on position	• Turn switches off for types of bills to be accepted
0.5	Escrowed Bill Declined by Controller	• HTK Controller may be configured to reject this bill type	• Verify HTK Controller Configuration is set to accept bill type
1/2 of 1.	Unit inhibited	• No ENABLE signal	• Check Controller reset • Check for open harness • Return for service
1.2	Secondary head noise too high	• Noisy frame, head, or PCB	• Clean heads and rollers • Return for service
1.3	Secondary Head	• Open head circuit	• Return for service
1.4	Primary head noise too high	• Noisy frame, head, or PCB	• Clean heads and rollers • Return for service
1.5	Primary Head signal	• Open head circuit	• Return for service
1.6	Rear sensor blocked	• Obstruction blocking	• Remove obstruction, clean
1.7	Rear sensor blocked	• Obstruction blocking	• Remove obstruction, clean
1.8	Front sensor blocked	• Obstruction blocking front sensor.	• Remove obstruction, clean sensor, cycle power, reset Controller
2.0	Stacker time-out	• Incorrect Controller or configuration switch setting • Stacker jam	• Verify that the Controller is a v1.6 or greater, and configuration switch #6 is on, cycle power • Clear jam • Return for service

TROUBLESHOOTING FOR STANDARD BILL OPERATION (CONTINUED)			
ERROR	**PROBLEM**	**POSSIBLE CAUSE**	**POSSIBLE SOLUTION**
2.1	Side sensors out of adjustment	• Possible component failure • Possible misalignment of sensors	• If this error continues to be displayed, return for service
2.3	Side sensors out of adjustment	• Possible component failure or vandalism	• If this error continues to be displayed, return for service
2.4	Side sensors out of adjustment	• Possible component failure or vandalism	• If this error continues to be displayed, return for service
2.6	Escrow Timeout	• Communications lost between validator and HTK controller	• Check that all harnesses are securely plugged into validator and stacker control board
4.X	Bill Validator optic error	• Rejected bill • Sensors dirty	• These errors can be displayed intermittently on bill rejects. This is a normal condition. • If you continuously get these errors with total reject condition, clean the sensors with a little mild soapy water. Do not let excess water get into the Validator and do not use anything abrasive on the front sensor. • Check for clogged sensor • Return for service
5.X	Bill Validator magnetics error	• Rejected bill • Bill not touching head	• These errors can be displayed intermittently on bill rejects. This is a normal condition. • If you continuously get these errors with total reject condition, check rollers to insure a good flat contacting point between head and roller is established • Return for service
6.X	Cheating attempt	• A cheating attempt has been detected	• Check inventory, cycle power to remove error • Assure latch studs are tightened completely

★ **NOTE: Any of these errors ending with a "4" (i.e. 6.X4) may be caused by the sidescans being out of adjustment.**

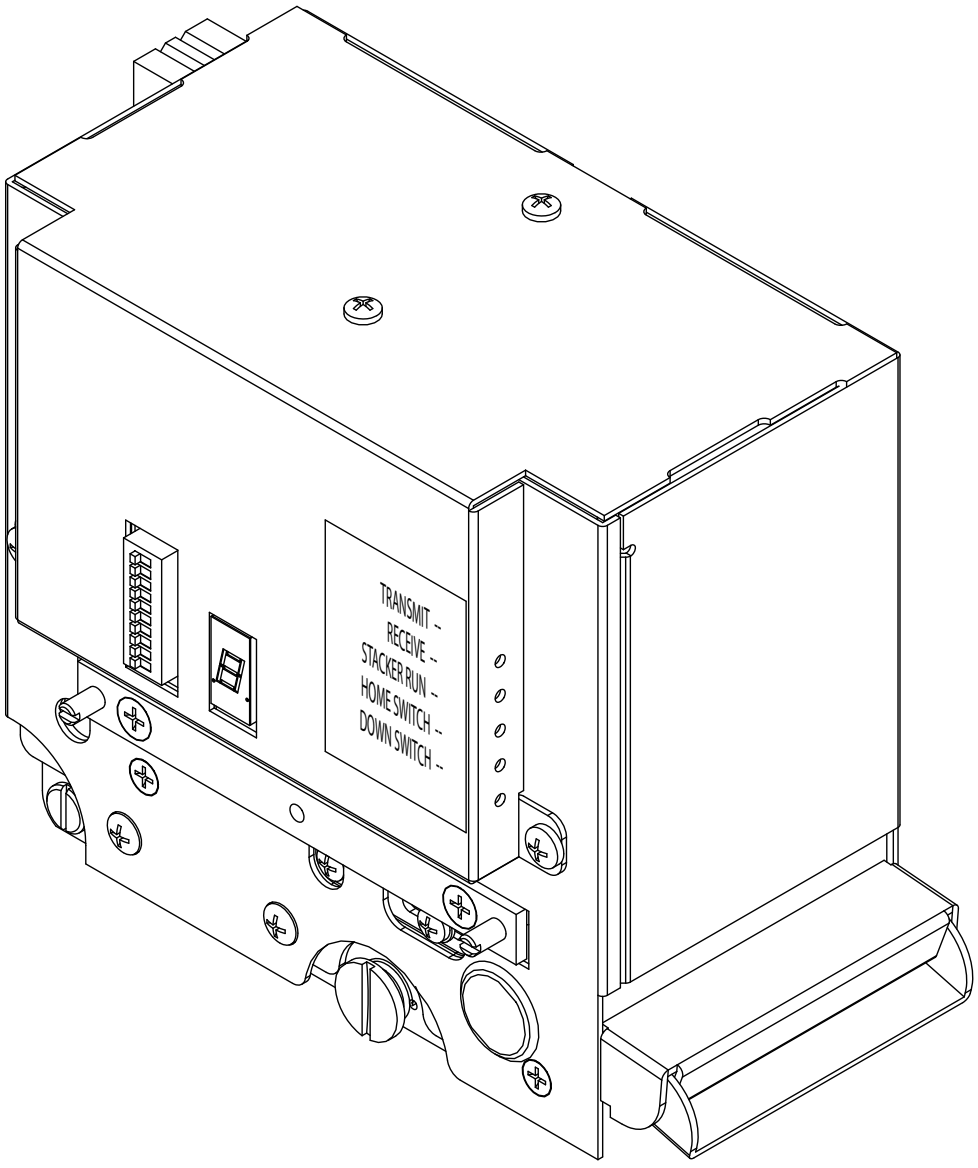
STANDARD BILL OPERATION (CONTINUED)			
ERROR	**PROBLEM**	**POSSIBLE CAUSE**	**POSSIBLE SOLUTION**
8.0	Low Magnetics	• Rejected bill • Bill not touching heads	• These errors can be displayed intermittently on bill rejects. This is a normal condition. • If you continuously get these errors with total reject condition, check rollers to ensure a good, flat contacting point between head and roller is established. • Return for Service
8.1	Short Bill	• The bill inserted was too short.	
J	Jammed bill	• Will be displayed for 2 minutes if the obstruction is not removed. After the 2 minutes, either an 1.7 or 1.8 will be displayed for the blocked sensor.	• Remove obstruction, clean sensor, cycle power, reset Controller
P.	Tokenote® programming	• All switches are turned ON.	• Turn switches back to normal positions.

With the introduction of the XE Smart Validator capabilities there are five additional diagnostic lights. Their operation is defined below.

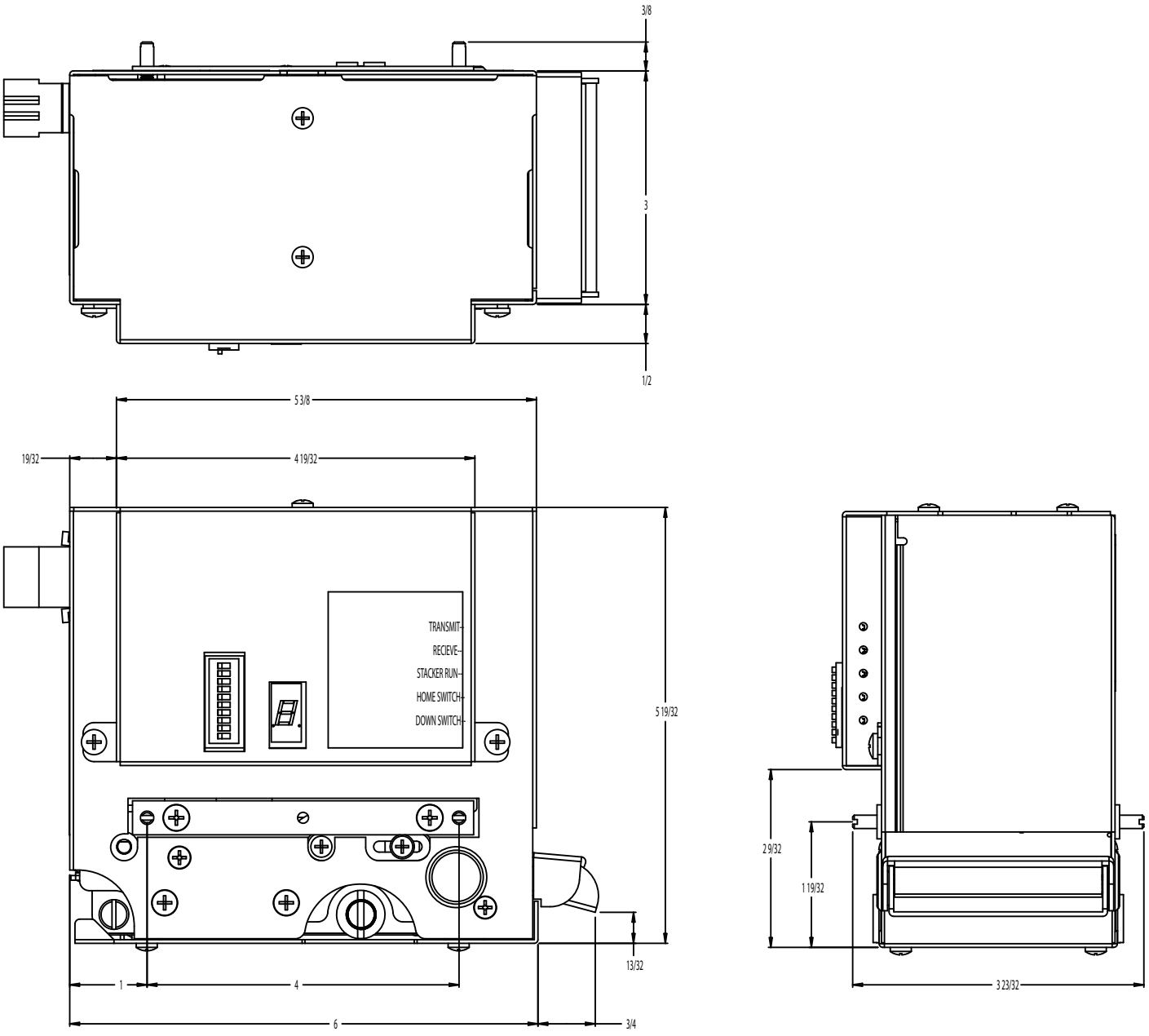


- VAL TXD – Validator Transmit LED
  This LED gives the status of the Validator transmit line
  ON = Validator is transmitting a message on the Smart Bus
  OFF = Validator is not transmitting
- VAL RXD – Validator Receive LED
  This LED gives the status of the Validator receive line
  ON = Validator is receiving a message from the Smart Bus
  OFF = Validator is not receiving
- STK RUN – Stacker Run Status LED
  This LED shows the status of the Stacker Run control line
  ON = Stacker control line is on, activating Stacker
  OFF = Stacker control line is off, Stacker is not active
- STK HOME – Stacker Home Status LED
  This LED shows the status of the Stacker Home switch. The operation of this LED depends on the type of Stacker used (Single/Separating). See table below.
- STK DOWN – Stacker Down Status LED
  This LED shows the status of the Stacker Down switch. The operation of this LED depends on the type of Stacker used (Single/Separating). See table below. Note, since it does not have a Down switch this status LED will always be ON for Single Stackers.

Stacker Position	Single Stacker	Separating Stacker
Home Position	Home LED = OFF Down LED = ON	Home LED = ON Down LED = OFF
Between Home and Down Position	Home LED = ON Down LED = ON	Home LED = OFF Down LED = OFF
Down Position	Home LED = ON Down LED = ON	Home LED = ON Down LED = ON



Appendix A
XE Validator Dimensions



LIMITED WARRANTY AGREEMENT OF HAMILTON MANUFACTURING CORP.

Hamilton Manufacturing Corp., an Ohio Corporation, ("Seller") warrants to Purchaser that all new equipment shall be free from defects in material and factory workmanship for a period of one (1) year from the original shipping date. Hamilton Manufacturing Corp. further warrants if any part of said new equipment in Seller's sole opinion, requires replacement or repair due to a defect in material or factory workmanship during said period, Seller will repair or replace said new equipment. Purchaser's remedies and the liabilities and obligations of Seller herein shall be limited to repair or replacement of the equipment as Seller may choose, and Seller's obligation to remedy such defects shall not exceed the Purchaser's original cost for the equipment. Purchaser EXPRESSLY AGREES this is the EXCLUSIVE REMEDY under this warranty. There are no other express or implied warranties which extend beyond the face hereof. All warranty repair service must be performed by either a Factory Trained Service Representative or **HAMILTON MANUFACTURING CORP., 1026 Hamilton Drive, Holland, Ohio 43528 PHONE (419) 867-4858 or (800) 837-5561, FAX (419) 867-4867.**

The limited warranty for new equipment is conditioned upon the following:

1. The subject equipment has not, in the Seller's sole opinion, been subjected to: accident, abuse, misuse, vandalism, civil disobedience, riots, acts of God, natural disaster, acts of war or terrorism.
2. The Seller shall not be liable for any expense incurred by Purchaser incidental to the repair or replacement of equipment and Purchaser shall assume full responsibility for any freight or shipping charges.
3. The coverage of this warranty shall not extend to expendable parts.
4. Purchaser shall have a warranty registration card on file with Seller prior to any claim in order for warranty protection to apply.
5. No warranty coverage is applicable to any equipment used for currency other than that specified at the time of the purchase.
6. Seller expressly disclaims any warranty that counterfeit currency will not activate said equipment.
7. Seller expressly disclaims any warranty for any losses due to bill manipulation or theft or loss of cash under any circumstances.
8. Use of the equipment for anything other than its intended and designed use will void the Limited Warranty Agreement. Use of equipment for anything other than its intended and designed use includes, but is not limited to, downloading software/applications not certified by Seller such as e-mail, spyware, screen savers, viruses, worms, third party software, web search engines, cookies, spam, desktop applications, games, web surfing, etc.

Seller further warrants all repair or service work performed by a factory trained representative or Hamilton Manufacturing Corp. for a period of ninety (90) days from the date the repair or service work was performed. Purchaser's remedies and the liabilities and obligations of Seller herein shall be limited to repair or replacement of equipment as Seller may choose, and Seller's obligation to remedy such defects shall not exceed the Purchaser's depreciated value of the equipment. Purchaser EXPRESSLY AGREES this is an EXCLUSIVE REMEDY under this warranty. There are no other express or implied warranties on repair or service work performed by a factory trained representative or Hamilton Manufacturing Corp. which extend beyond the face hereof.

The limited warranty for repair and service work is conditioned upon the following:

1. The subject equipment has not, in the Seller's sole opinion, been subjected to: accident, abuse, misuse, vandalism, civil disobedience, riots, acts of God, natural disaster, acts of war or terrorism.
2. The Seller shall not be liable for any expense incurred by Purchaser incidental to the repair or replacement of equipment and Purchaser shall assume full responsibility for any freight or shipping charges.
3. The coverage of this warranty shall not extend to expendable parts.
4. Purchaser shall have a warranty registration card on file with Seller prior to any claim in order for warranty protection to apply.
5. No warranty coverage is applicable to any equipment used for currency other than that specified at the time of the purchase.
6. Seller expressly disclaims any warranty that counterfeit currency will not activate said equipment.
7. Seller expressly disclaims any warranty for any losses due to bill manipulation or theft or loss of cash under any circumstances.
8. No person or entity other than a factory trained representative or Hamilton Manufacturing Corp. has performed or attempted to perform the subject repair or service.
9. Using equipment which has been serviced or repaired for anything other than its intended or designed use such as downloading software applications not certified by Seller will void the Limited Warranty Agreement. This includes software/applications such as e-mail, spyware, screen savers, viruses, worms, third party software, web search engines, cookies, spam, desktop applications, games, web surfing, etc.

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The Purchaser agrees that in no event will the Seller be liable for direct, indirect, or consequential damages or for injury resulting from any defective or non-conforming new, repaired or serviced equipment, or for any loss, damage or expense of any kind, including loss of profits, business interruption, loss of business information or other pecuniary loss arising in connection with this Limited Warranty Agreement, or with the use of, or inability to use the subject equipment regardless of Sellers knowledge of the possibility of the same.

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