

# **Hamilton Manufacturing Corporation**

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## **C2000 Operational Manual**

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## ABOUT THIS MANUAL

This manual was designed to introduce the C2000 Controller and explain its functions and how it operates. It will also enable the operator to detect error codes and perform basic troubleshooting procedures. Included in this manual is a switch setting configuration for optional payout modes. If further assistance is needed, please call the manufacturer at (800) 837-5561 or (419) 867-4858.

When calling for assistance, you must have the CONTROLLER MODEL & SERIAL NUMBER readily available. Please record this information in the spaces provided.

**C2000 MODEL #** \_\_\_\_\_

**SERIAL #** \_\_\_\_\_

# I. INTRODUCTION

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The C2000 Controller makes operating a Bill Changer simple. The Controller monitors the inputs from the various components and controls the Validator, Stacker and Hopper(s). It also monitors the power supply for fluctuations in current and voltage.

When the customer inserts a bill, change or tokens are dispensed according to a payout scheme selected by the operator. There are many payout schemes embedded in the program that are easily accessed by changing switch settings. Also, in the event of short power failures, the Controller will retain in memory any uncompleted payouts. Another feature is an LED that indicates the status of the changer, displaying error codes if necessary.

## *Options*

The C2000 Controller features several options.

- ◆ Tokenotes® can be accepted to vend token coins when a token payout scheme is selected. (Refer to the Tokenote® Training Guide.)
- ◆ \$1 bills can be separated from \$5, \$10 and \$20 bills when a dual stacker is installed. (Refer to the Dual Stacker Manual.)
- ◆ The standard C2000 Controller accesses different preprogrammed payouts using DIP switches.

## II. OPERATION

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On the face of the C2000 Controller there is a white COMPUTER RESET button, a green LED, and a bank of 12 Vend Switches. On one side is the Card Edge Connector, which is where the main wiring harness of the changer connects. The Card Edge Connector is polarized to avoid reversing connections. On the inside of the Controller is another bank of 8 DIP switches; these are the Configuration Switches.

### *Vend Switches*

The 12 DIP switches on the face of the Controller select the different payout schemes available when set to different positions. APPENDIX A depicts a list of the most common payout schemes and indicates how to arrange the switches for each. There is no need to change these switch settings as they are set to the payout arranged when the order was placed with Hamilton. However, if you are not satisfied with the current payout setting, you can choose from one of the standard switch settings in APPENDIX A, or call Hamilton for further assistance. **YOU MUST HAVE THE CONTROLLER MODEL & SERIAL NUMBER READY WHEN CALLING.**



**The computer reset button must be pressed after changing the switch settings.**

### *Configuration Switches*

Switch 2 (SW2) refers to the bank of 8 DIP switches on the logic board. The logic board is the smaller piggybacked board on the underside of the controller. These switches tell the Controller which type of hoppers and coin mech are connected. Also, one of the switches configures the Controller to integrate with the Dual Stacker / HVX Validator combination. **THESE SWITCHES ARE SET AT THE FACTORY AND SHOULD NOT BE CHANGED**, unless the models of equipment you are using in the machine change. Refer to APPENDIX B for details of settings.

### *LED*

The green LED located on the face of the controller near the Computer Reset button indicates the status of the bill changer. When the LED is lit constantly, it is indicating that everything is normal and the Controller is running. When a fault is detected, the Controller automatically shuts the machine down. The green LED will begin a sequence of flashes, which indicates the appropriate error code. To read an error code, watch the flashing LED. Note that there is a series of flashes, a short pause, another series of flashes, then a long pause. After the long pause, count the number of flashes seen, wait while the LED pauses briefly, then count the next series of flashes. The sequence will continue until the Computer Reset Button is pressed.



**Watch the flashing sequence several times to ensure the message is interpreted properly.**

## ***Resetting***

The white COMPUTER RESET button is located on the face of the Controller. After an error has occurred, reset the computer by depressing the COMPUTER RESET button once. The LED will go out while the Controller resets. Once the controller has reset, the LED will turn back on as a steady light.

# III. ERROR CODES

As described earlier in the OPERATION section, when a fault has been detected, the LED will flash an error code. An LED that remains off indicates no power or a major failure of the Controller. In the event that a malfunction occurs, the following pages provide assistance for diagnosis.



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

ERROR CODES	
1 FLASH, PAUSE, 1 FLASH	HOPPER 1 EMPTY
1 FLASH, PAUSE, 2 FLASHES	HOPPER 2 EMPTY
1 FLASH, PAUSE, 3 FLASHES	HOPPER 3 EMPTY
1 FLASH, PAUSE, 4 FLASHES	ALL ALTERNATING-DEFAULTING HOPPERS ARE EMPTY
2 FLASHES, PAUSE, 1 FLASH	HOPPER 1 JAMMED
2 FLASHES, PAUSE, 2 FLASHES	HOPPER 2 JAMMED
2 FLASHES, PAUSE, 3 FLASHES	HOPPER 3 JAMMED
3 FLASHES, PAUSE, 1 FLASH	NICKEL INPUT STUCK
3 FLASHES, PAUSE, 2 FLASHES	DIME INPUT STUCK
3 FLASHES, PAUSE, 3 FLASHES	QUARTER INPUT STUCK
3 FLASHES, PAUSE, 4 FLASHES	\$1 DOLLAR INPUT STUCK
3 FLASHES, PAUSE, 5 FLASHES	\$5 DOLLAR INPUT STUCK
4 FLASHES, PAUSE, 1 FLASH	HOPPER 1 COIN DROP STUCK
4 FLASHES, PAUSE, 2 FLASHES	HOPPER 2 COIN DROP STUCK
4 FLASHES, PAUSE, 3 FLASHES	HOPPER 3 COIN DROP STUCK
5 FLASHES, PAUSE, 1 FLASH	UNEXPECTED HOPPER 1 PAYOUT
5 FLASHES, PAUSE, 2 FLASHES	UNEXPECTED HOPPER 2 PAYOUT
5 FLASHES, PAUSE, 3 FLASHES	UNEXPECTED HOPPER 3 PAYOUT
6 FLASHES, PAUSE, 1 FLASH	STACKER BUSY TIMEOUT
6 FLASHES, PAUSE, 2 FLASHES	INVALID PAYOUT SWITCH SETTING
6 FLASHES, PAUSE, 4 FLASHES	TIMEOUT FOR VALIDATOR TO ADVANCE BILL (DUAL STACKER)
6 FLASHES, PAUSE, 5 FLASHES	VALIDATOR SHUT DOWN ERROR
7 FLASHES, PAUSE, 2 FLASHES	POWER LOSS DURING VEND
7 FLASHES, PAUSE, 3 FLASHES	INVALID TOKENOTE CODE

\*The following pages provide detailed definitions of error codes.

# ***ERROR CODE DEFINITIONS***

## **COIN DROP STUCK**

Since the coin count switch in the hopper is **NORMALLY CLOSED**, a coin passing under the count switch **OPENS** the circuit. The Controller allows only a short time for a coin to pass under and open the switch and for a coin to drop. If the switch remains open for too long, the Controller will shut down the changer because it is unable to count dispensed coins accurately. This message could mean that the count switch is stuck, the count switch is broken, or there is a broken connection elsewhere in the circuit.

## **HOPPER JAMMED**

If this message is displayed, the Controller has not detected any count signals from the hopper or the counting circuit has remained closed. The Controller allows a specified amount of time to recognize a payout. If the Controller has not detected a payout, it “times-out”. This message could mean that the count switch is out of adjustment or broken. It could also mean that the hopper is jammed or unable to “pick-up” coins.



**The above two (2) errors cannot be detected until the Controller turns on the Hopper(s), and will not be detected on powerup or in standby mode.**

## **INPUT STUCK**

An **INPUT** refers to a signal coming from the validator or coin mech which notifies the controller that money (coins or bills) has been inserted into the change machine. The **INPUT STUCK** message refers to each input type as being continuous, where a normal input is of only brief duration. This message points to a malfunction in the validator or coin mech.

## **UNEXPECTED HOPPER PAYOUT**

This message will appear if the Controller has detected a coin payout signal when the hopper has not been “authorized” to run. The Controller has detected an unexpected open and close of the count circuit.

## **STACKER BUSY TIMEOUT**

The bill stacker is part of a **NORMALLY CLOSED** circuit. When the circuit is opened, the Controller detects that the stacker is in mid-cycle. The Controller acknowledges this by keeping the validator disabled until the cycle is complete. A normal stacker cycle lasts only a couple of seconds. If this cycle lasts too long (for example, if the stacker was jammed), the computer shuts down. A broken connection in the stacker busy circuit would also cause a shutdown.

## **HOPPER EMPTY**

The hopper has sensor strips that detect the level of coins. When the coin level falls below the strips, the circuit is open and the hopper is considered empty. (This will occur even if there are some coins left in the hopper.)



## **INVALID PAYOUT SWITCH SETTING**

As explained in the Operation section, the bank of 12 Vend switches located on the face of the controller are used to select payout options. The switch positions should not need to be changed as they are preset. When the switches are set to a non-sense pattern, one that does not match an existing payout scheme, an INVALID PAYOUT SWITCH SETTING error will result.

## **TIMEOUT FOR VALIDATOR TO ADVANCE BILL**

This occurs only when the controller is configured to operate a dual stacker. The Controller signals the validator that the dual stacker is in its down position. If the validator does not advance the bill into the stacker within a certain amount of time, this time-out error will occur. This error could be caused from improper switch settings. If a dual stacker is being used, switch 4 on the HVX Validator must be turned ON and switch 2 on the underside of the C2000 Controller (the configuration switches) must be turned ON. A malfunction in the validator could also cause this time-out error.

## **VALIDATOR SHUT DOWN ERROR**

If the validator shuts down the Controller, this error will flash. For example, if a bill gets hung up on the rear sensor causing the bill to be stolen, the validator will be inhibited and will shut down the C2000 Controller. If this error flashes, check the validator display for an error message. (Refer to the Validator Manual for help.)

## **UNSTABLE 120 VAC (POWER LOSS)**

If the Controller detects an extreme voltage drop during payout, it will normally finish the correct payout. The Controller can recover and finish vending through several voltage drops during a payout. However, if there are too many voltage drops during one payout, the microprocessor considers the power source unusable and shuts the changer down. If this condition occurs repeatedly, consult an electrician or the Power Company.

# APPENDIX A

## Switch Settings 1 and 2 Hopper Mode

SWITCH SETTING													MODE OF OPERATION/PAYOUTOPTIONS			
OFF	+	+	+	+	+	+	+	+	+	+	+			1 HOPPER - TOKENS		
ON														1q = 1t	10\$ = 45t	
1	A	B	C	D	E	F	G	H	I	J	K	L			1\$ = 4t	20\$ = 100t
															5\$ = 20t	
OFF	+	+	+	+	+	+	+	+	+					1 HOPPER - TOKENS		
ON										+	+			1q = 1t	10\$ = 10t	
18	A	B	C	D	E	F	G	H	I	J	K	L			1\$ = 1t	20\$ = 20t
															5\$ = 5t	
OFF	+	+	+	+	+	+	+	+							1 HOPPER - TOKENS	
ON										+	+			1q = 1t	10\$ = 40t	
22	A	B	C	D	E	F	G	H	I	J	K	L			1\$ = 4t	20\$ = 80t
															5\$ = 20t	
OFF	+	+	+	+	+	+	+			+	+			1 HOPPER - TOKENS		
ON										+	+			1q = 1t	10\$ = 50t	
25	A	B	C	D	E	F	G	H	I	J	K	L			1\$ = 5t	20\$ = 100t
															5\$ = 25t	
OFF	+	+	+	+	+	+	+	+	+	+			1 HOPPER - QUARTERS			
ON							+							1\$ = 4q	10\$ = 40q	
32	A	B	C	D	E	F	G	H	I	J	K	L			5\$ = 20q	20\$ = 80q
OFF	+	+	+	+	+	+	+			+	+			1 HOPPER - QUARTERS		
ON									+	+			1q = 1q	10\$ = 40q		
36	A	B	C	D	E	F	G	H	I	J	K	L			1\$ = 4q	20\$ = 80q
															5\$ = 20q	
OFF	+	+	+	+	+	+			+	+			1 HOPPER - TOKENS			
ON									+	+			1\$ = 5t	10\$ = 40t		
49	A	B	C	D	E	F	G	H	I	J	K	L			5\$ = 20t	20\$ = 80t
OFF	+	+	+	+	+			+		+	+			1 HOPPER - TOKENS		
ON						+	+	+			+				1\$ = 4t	10\$ = 50t
116	A	B	C	D	E	F	G	H	I	J	K	L			5\$ = 22t	20\$ = 100t



**SWITCH SETTING**

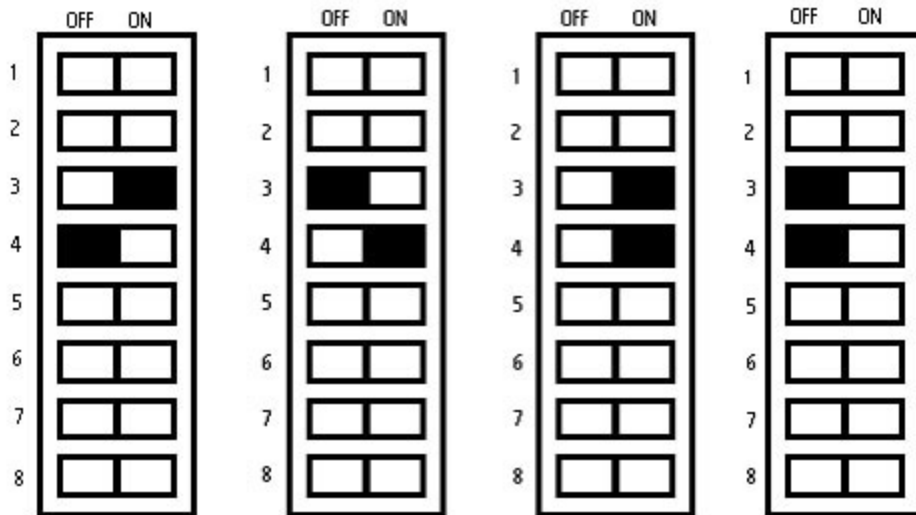
**MODE OF OPERATION/PAYOUTOPTIONS**

											2 HOPPERS - QUARTERS, DIMES			
OFF	+	+	+	+	+	+			+	+	+			
ON							+		+				2q = 5d	10\$ = 40q
40	A	B	C	D	E	F	G	H	I	J	K	L	1\$ = 4q	20\$ = 80q
											5\$ = 20q			
											2 HOPPERS - TOKEN, TOKEN			
OFF	+	+	+	+	+	+			+		+	+		
ON							+	+		+			1\$ = 4t	10\$ = 45t
52	A	B	C	D	E	F	G	H	I	J	K	L	5\$ = 22t	20\$ = 90t
											2 HOPPERS - QUARTERS, NICKELS			
OFF	+	+	+	+	+		+		+		+			
ON							+	+		+	+		1\$ = 3q+5n	10\$ = 38q+10n
85	A	B	C	D	E	F	G	H	I	J	K	L	5\$ = 19q+5n	20\$ = 76q+20n
											2 HOPPERS -QUARTERS, DIMES			
OFF	+	+	+	+	+		+		+					
ON							+	+		+	+	+	1\$ = 2q+5d	10\$ = 38q+10d
87	A	B	C	D	E	F	G	H	I	J	K	L	5\$ = 16q+10d	20\$ = 76q+10d
											2 HOPPERS - QUARTERS, DIMES			
OFF	+	+	+	+	+		+		+	+	+			
ON							+	+	+				2q = 5d	10\$ = 36q+5d
88	A	B	C	D	E	F	G	H	I	J	K	L	1\$ = 2q+5d	20\$ = 78q+5d
											5\$ = 18q+5d			
											2 HOPPERS -QUARTERS, TOKENS			
OFF	+	+	+	+	+				+	+				
ON							+	+	+		+	+	1q = 1t	10\$ = 20q+20t
115	A	B	C	D	E	F	G	H	I	J	K	L	1\$ = 2q+2t	20\$ = 40q+40t
											5\$ = 10q+10t			
											2 HOPPERS - QUARTERS, SBA			
OFF	+	+	+	+	+				+					
ON							+	+	+		+	+	1s = 4q	10\$ = 8q+8s
119	A	B	C	D	E	F	G	H	I	J	K	L	1\$ = 4q	20\$ = 16q+16s
											5\$ = 4q+4s			
											2 HOPPERS - QUARTERS, NICKELS			
OFF	+	+	+	+	+	+	+		+	+	+			
ON					+					+			1q = 5n	10\$ = 40q
130	A	B	C	D	E	F	G	H	I	J	K	L	1\$ = 3q+5n	20\$ = 80q
											5\$ = 20q			



# APPENDIX B

## Configuration Switch Settings

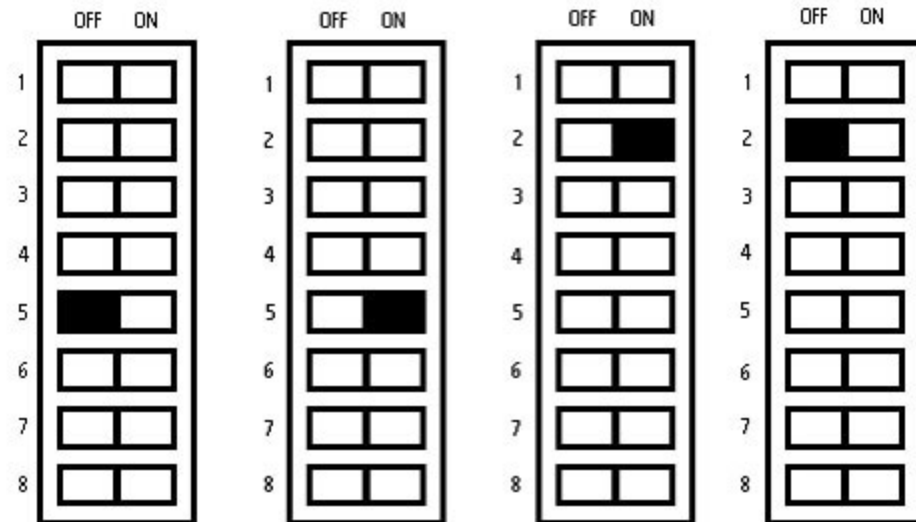


COINCO I

COINCO II  
&  
COINCO III

SLUGBUSTER

NO  
COIN  
MECH



NEW HOPPER

OLD HOPPER

USING  
DUAL  
STACKER

NO  
DUAL  
STACKER

## **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.

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.

(See next page for additional provisions)

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.

THIS AGREEMENT IS MADE WITH THE EXPRESS UNDERSTANDING THAT THERE ARE NO IMPLIED WARRANTIES THAT THE EQUIPMENT SHALL BE MERCHANTABLE, OR THAT THE GOODS SHALL BE FIT FOR ANY PARTICULAR PURPOSE. PURCHASER HEREBY ACKNOWLEDGES THAT IT IS NOT RELYING ON THE SELLER'S SKILL OR JUDGMENT TO SELECT OR FURNISH EQUIPMENT SUITABLE FOR ANY PARTICULAR PURPOSE AND THAT THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THAT WHICH IS DESCRIBED HEREIN.

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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