Vending Machine Simulator
USER'S MANUAL

Group O3

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Table of Contents

1. Set Up

For the design to perform correctly, the following connections should be made. Connections are described in terms of the labelling on the board.

Port Group	Pin	Port Group	Pin
AVR Pins (top and bottom row)		Input/Output Device Pins (middle row)	
PORT F	PF0	LCD DATA	D0
PORT F	PF1	LCD DATA	D1
PORT F	PF2	LCD DATA	D2
PORT F	PF3	LCD DATA	D3
PORT F	PF4	LCD DATA	D4
PORT F	PF5	LCD DATA	D5
PORT F	PF6	LCD DATA	D6
PORT F	PF7	LCD DATA	D7
PORT K	PK8	INPUTS	POT
PORT K	PK9	INPUTS	LDR
PORT K	PK10	AUDIO	MiO
PORT E	PE5	LCD CTRL	BL
PORT E	PE3	AUDIO	Ain
PORT E	PE2	MOTOR	Mot
PORT D	TDX2	MOTOR	OpO
PORT D	RDX3	INPUTS	PB1
PORT D	RDX4	INPUTS	PB0
PORT A	PA2	-	-
PORT A	PA3	MOTOR	LED
PORT A	PA4	LCD CTRL	BE
PORT A	PA5	LCD CTRL	RW
PORT A	PA6	LCD CTRL	E
PORT A	PA7	LCD CTRL	RS
PORT C	PC0	LED BAR	LED2
PORT C	PC1	LED BAR	LED3
PORT C	PC2	LED BAR	LED4
PORT C	PC3	LED BAR	LED5
PORT C	PC4	LED BAR	LED6
PORT C	PC5	LED BAR	LED7
PORT C	PC6	LED BAR	LED8
PORT C	PC7	LED BAR	LED9
PORT G	PG0	-	-
PORT G	PG1	AUDIO	ASD
PORT G	PG2	LED BAR	LED0
PORT G	PG3	LED BAR	LED1
PORT L	PL0	KEYPAD	C3
PORT L	PL1	KEYPAD	C2
PORT L	PL2	KEYPAD	C1
PORT L	PL3	KEYPAD	C0
PORT L	PL4	KEYPAD	R3
PORT L	PL5	KEYPAD	R2
PORT L	PL6	KEYPAD	R1
PORT L	PL7	KEYPAD	R0
P11	+5V (any)	MOTOR	OpE

2. Start Screen

After device startup, the LCD screen displays the text below for 3 seconds and then go to the main menu screen. When any keypad button is pressed in the progress, the device directly goes to the main menu screen as well.

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Vending Machine

3. Starting Inventory

When the program is first started, each item has an inventory count equal to its identifying number. The cost for each item will be 1 coin for odd numbered items and 2 coins for even numbered items.

4. Main Menu

In the main menu, the LCD displays the text below. Pressing any of the keypad number buttons 1-9 will attempt to retrieve the corresponding item. If any items are in the inventory, the program goes to the "Insert coins" screen. Otherwise it goes to the "Out of stock" screen. Using any other input devices will not affect the program.

Select item

5. Admin mode

Holding down the '*' key for 5 seconds while on the main menu will enter admin mode. The admin mode screen allows the user to select and modify the inventory counts and costs of each item. By default, item 1 will be selected and the selection can be changed by pressing the numbers 1-9 on the keypad. The LCD shows below.

Admin mode ?
$

*Where '?' is the number of the currently selected item, '#' is the inventory count of the current item, and '$' is the cost of the current item preceded by a '$' character.

The LEDs shows the inventory count of the current selected item, using one light for each item starting with the bottom LED. If the right button(PB0) is pressed the count for the selected item should be increased, up to a maximum of 10. If the left button(PB1) is pressed the count should be decreased, down to a minimum of zero. If the 'A' button is pressed then the cost for the current item should be increased, up to a maximum of 3 coins. Pressing 'B' will decrease the cost down to a minimum of 1 coin. If the 'C' button is pressed then the count for the selected item should be set to zero immediately. Pushing the '#' key in admin mode will exit admin mode to the main menu.

6. Out of stock

When selecting an item which is not in the inventory, the LCD will display the message below for 3 seconds and all 10 LEDs will flash for 3 seconds and then return to the main menu. When any push button is pressed in the progress, the device directly goes to the main menu screen as well.

Out of stock
?

* Where '?' is replaced by the number of the item that was selected on the main menu.

7. Coin Insert

After selecting an item which is in the inventory, the LCD shows the user to enter coins, and displays the number of coins still required.

Insert coins
?

*Where '?' is replaced with the number of coins remaining and is updated in the real time.

One coin will be inserted using the potentiometer by completely spinning from left to right and back to left. The LEDs will count the number of coins that have been entered so far, using one light for each coin starting with the bottom LED. When the number of coins remaining is 0, the program will deliver the item and the current inventory count will be decremented. If the '#' in keypad is pressed then the current

selection will be aborted and the program will return to the main menu.

8. Coin return

When the '#' in keypad is pressed while inserting coins and the selection is aborted after coins have been entered, the program will return each coin by spinning the motor at full speed for 0.25 seconds followed by a 0.25 second pause before returning any other coins.

9. Delivering item

Having completed payment, the machine will show the text below and deliver the item to the user by spinning the motor at full speed for 3 seconds and flash all 10 LEDs for 3 seconds. Afterwards, the program will go back to the main menu. Using any input devices will not affect the device.

Delivering item