Introduction

Thank you for purchasing the SP-1 Conversion Kit for Single Price Vending machines. This kit is quite simple to install and operate. The optional LCD display will enable you to program basic function and retrieve accounting information such as the value in the coin tubes of the changer and the sales. Version plus of the conversion kit, the SP-1*plus*, offers DEX capability.

This SP-1 kit will not transform your single-price machine into a multi-price machine. It only allows you to replace your discontinued single-price coin changer with a new state-of-the-art MDB coin changer and add other MDB peripherals such as a bill acceptor or a cashless system.

The kit was designed to work solely in a Single-Price 120-volt machine. It cannot work in a Four-price machine. The FP-1 conversion kit is available for Four-price machines. Both are very similar. The most recognizable difference is the number of relays. The SP-1 has only two relays while the FP1 has five.

The SP-1 conversion kit can work in any country in the world providing you connect the proper coin changer, bill acceptor, cashless device, or a combination of those three peripherals. The SP-1 can display messages in the following four languages: English, French, Portuguese, and Spanish. Switching language is done using the two programming buttons on the board. The new SP-1 also offers a unique feature called the basic price setting. Depending on your needs, you can decide to set the basic value to match a specific base. In Brazil, Canada, and in the USA, the default price base is $0.05. In Mexico, it is $0.50.

Firmware V1.6 & up of the SP-1 includes the token and coupon features.

The SP-1 conversion kit contains the following components:
- One 100-240V, 50-60 Hz Switching Power supply
- One circuit board mounted on an aluminum plate and protected by a transparent Lexan
- One harness to connect into the Single-Price socket in the machine
- Optional 2X16 LCD display with stainless steel bezel and 24-inch (60cm) flat ribbon cable
- If distance exceeds 24" (60cm), an MDB display is available with a 16' (5m) cable connecting on the MDB port.

The SP-1 works with...

The SP-1 Conversion Kit will work with one or more of the following peripherals:

Coin changer MDB: (Coinco, Conlux, MEI, NRI)
- Level 2, 3-tube & 4-tube
- Level 3, 4-tube, 5-tube, & 6-tube

Coin acceptor:
- NRI G13 with its MDB adaptor. Please note that when using this acceptor, it is impossible to give back change (see Multi Vend parameter)

Bill acceptor:
- Most MDB bill acceptor of any country
- Most dry contact Pulse type acceptor on connector J4 (#14 on image)

Cashless:
- The majority of MDB cashless devices on the market *(available only with the SP-1plus version).*

How does it work?

The SP-1 Conversion Kit works the same way the old single-price coin changer was working. Once the amount inserted is equal to the vend price or higher, the credit relay will click briefly sending a signal to the Vend relay in the machine through Line 3 while shutting down Line 7. Once the signal sent, change will be dispensed if need be. Once the signal sent to the Vend relay inside the machine, the customer CANNOT cancel the transaction. The customer MUST make a choice. As long as the Vend relay in the machine is energized, Line 6 (Accept Line) is cut, preventing the insertion of money into the machine. Once the product delivered, Line 6 will come back thus sending the signal to the SP-1 to accept money again.
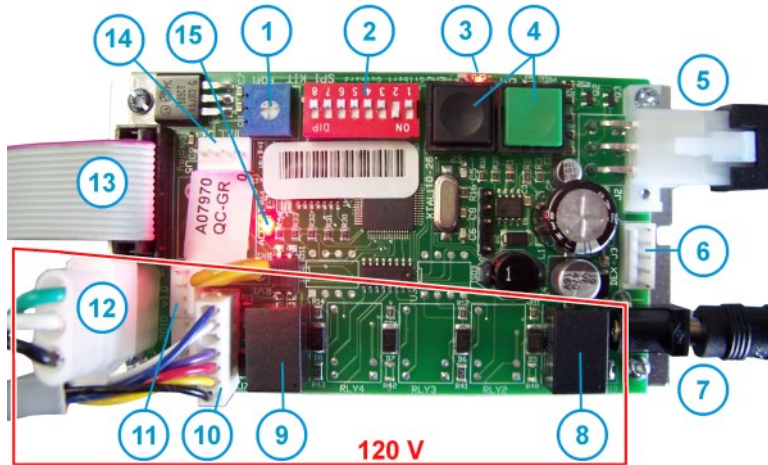
If you are using an NRI G13 Coin Acceptor with its MDB adaptor, it will not be possible to give change to the customer if he inserts more than needed. The same will also apply if you are using a bill acceptor only. If so, the re-

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maining credit will stay in the memory of the SP-1 so that the customer can start a second transaction. Consult the Multi Vend parameter.

Note about the electrical power outside of North America.

Most power outlets outside of North America offer a 220-volt, 50Hz source. Even though the switching power supply supplied with the SP-1 is capable of working on such a power source, the SP-1 was NOT designed to work with such a voltage. Applying 220-volt to the SP-1 will automatically damage it.

DO NOT USE THE SP-1 IN A 220-VOLT ENVIRONMENT !

120 V

Description of board
1. LCD display level adjustment (POT 1)
2. Price setting switches (SW 1)
3. Programming LED
4. Programming buttons
5. MDB connector (J2)
6. DEX connector (J3) functional only with the SP-1*plus* version
7. 24-volt DC input (J1)
8. Credit relay (RLY 1)
9. Exact change relay (RLY 5)
10. Header to Coinco-style single-price harness (J7)
11. Header to Mars-style single-price harness (J6)
12. 120-volt output to power supply (J8)
13. Flat ribbon to display (J5)
14. Pulse-type bill acceptor (J4) see pin-out section
15. Accept Line detection LED (L6)

Installing the SP-1 Conversion Kit in a Single-Price 120-volt machine

Installing the SP-1 Conversion Kit does not require great technical skills. Just follow these simple instructions and it will take just few minutes.
- Make sure your machine is in correct working condition and ready to dispense products.
- Disconnect the machine from the wall or shut off main power switch.
- Make sure there is no power in the machine before unplugging any element.
- Remove the Single-Price coin changer from its current location.
- Do not forget to remove the change from the tubes.
- Install the new MDB coin changer and fill the tubes.
- Find a place where you can fix the new circuit board and the new power supply. Make sure no harnesses or wires will interfere with the coin insertion and the coin return arm. Make sure the new board cannot move.
- Connect the power supply to the board.
- Connect the new MDB coin changer into the SP-1 Conversion Kit.
- Connect the 8+1-pin Jones plug into the single-price socket of the machine.
- Install the optional LCD display by following the instruction that comes with the display.
- Secure the flat ribbon harness so that it does not interfere with the operation of the machine.
- Connect the flat ribbon in the proper socket on the new board.
- Once everything properly connected, apply power to the machine.
- Program your kit according to your specific requirements (language, basic price, vend price, Line 6).
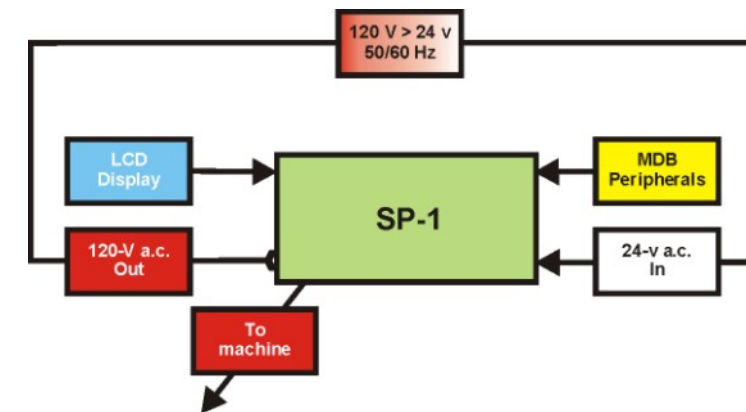- Make some tests.

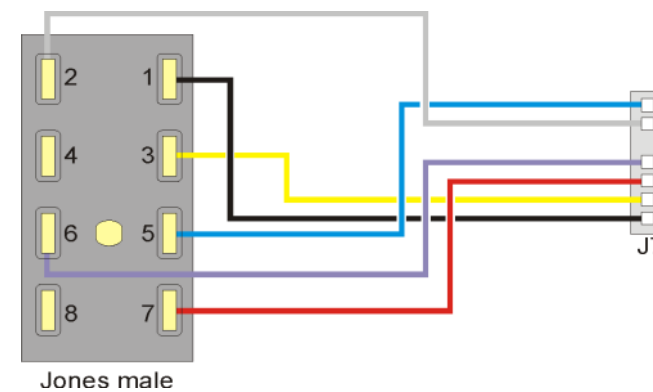## Pin-Out for the SP-1

The pin-out of the SP-1 to the Single-Price machine is the same as the original coin changer.

Pin-Out SP-1 to machine			
Jones Plug	Description	J7 on SP-1	Wire Colour
1	Hot 120 Volts a.c.	7	Black
2	Neutral	2	White
3	Power to Vend (vend signal)	6	Yellow
4	n/c		
5	Exact Change	1	Blue
6	Accept Line	4	Purple
7	Power to selection	5	Red
8	n/c		

Jones male

Pulse type bill acceptor

If you are using a pulse-type bill acceptor, it must connect to J4 on the board (see #14 on circuit description)

The pin-out is:
1- GND (Pin #1 is closest to display connector)
2- Bill inhibit
3- No connection
4- Bill pulse

Programming your SP-1 kit

The following applies to a kit equipped with the optional LCD display. If your kit does not have an LCD display, follow the instructions on reverse.

The display is an LCD 2-lines by 16 characters. It can be blue or green. The display can be a fixed one or it can be a portable one that you will use only for programming purposes.

To access the programming of the different parameters, you must access the hidden menu. Disconnect power to the SP-1. Press on both the Black & Green buttons on the board while applying power. Release the buttons when the display becomes blank. **Price Base** is then visible.

Price base — (or programming the basic value of dipswitch #1)

As the SP-1 can work in many countries around the world, it must adapt to the price level in each country. To achieve this goal, we added a unique feature that enables you to set the basic value of switch #1. This basic value starts at $0.05 and goes up to $12.75. If the price base is not what you want, press on the green button to increase it. To decrease, press and hold the green button and press on the black button. The maximum value is $12.75. The setting can wrap around. So, if you are at $0.05 and wish to fix a value of $12.75, it will be faster to decrease rather than to increase. This Price base is the value of switch number one on the dipswitch block. Once the price set, press on the black button to confirm. The display will show you the new setting is being registered.

Please note that the price base will vary depending the country of the coin changer you have in the machine. If you install a Mexican coin changer, the price base will be $0.50. In Colombia, the price base will be $5 no decimals. Of course, the higher the price base, the higher you can go in the vend price.

Next are some examples of the prices you can get depending the Price Base value.

Price base	$0,05	$ 0,25	$ 0,50	$ 1,00	$ 5,00	$ 10,00	$12,75
Switch 1	0,05	0,25	0,50	1,00	5,00	10,00	12,75
Switch 2	0,10	0,50	1,00	2,00	10,00	20,00	25,50
Switch 3	0,20	1,00	2,00	4,00	20,00	40,00	51,00
Switch 4	0,40	2,00	4,00	8,00	40,00	80,00	102,00
Switch 5	0,80	4,00	8,00	16,00	80,00	160,00	204,00
Switch 6	1,60	8,00	16,00	32,00	160,00	320,00	408,00
Switch 7	3,20	16,00	32,00	64,00	320,00	640,00	816,00
Switch 8	6,40	32,00	64,00	128,00	640,00	1 280,00	1 632,00
Max. Price Possible	$ 12,75	$ 63,75	$ 127,50	$ 255,00	$ 1275,00	$ 2550,00	$ 3 251,25

IMPORTANT! Do not use the Price Base as your primary tool to set the vend price. If you do not need to change the value of the dipswitch #1, leave it the way it is and use the dipswitches as your primary tool for setting the price, just like you were doing previously with the coin changer. The default Price base value is set depending the coin changer scaling factor.

Language —

You have the choice between English, French, Portuguese, and Spanish. If the current language in not yours, press the green button until you see your language. Press the black button again to confirm.

Currency symbol —

You have the choice between the dollar sign ($), the Euro sign (€) or none. Press on the green button to change it. Confirm with black.

Accept line (L6) —

The next parameter is the Accept Line (L6) setting. The accept line is the signal the machine sends to the coin changer to tell it to accept coins. This line normally goes off if the machine is not in a working condition (i.e. empty or jammed), or when the machine is delivering a product. You should set this parameter to YES. If you set it to NO, the coin changer will accept coins even if the machine is not capable of dispensing a product.

Cashless type — (only visible with the SP-1plus version)

There are many cashless systems in use worldwide. Some are magnetic, some are chip, some are contactless, etc. You can adapt the message on the display to fit your system. You have the choice between: Insertion, Swipe, Proximity, Key, and Tag. Press on the green button to scroll. Press on the black to confirm the setting. If you have the SP-1 version, you must change the entire circuit if you want to upgrade with version SP-1plus.

Token type — (only visible if detected on power up)

Coin changer can be programmed to accept a token and bill acceptor can be programmed to accept a coupon. In both cases, you can set a value or you can decide to give a free vend. If you set the parameter to **"Free"**, free access will be given to the machine, no matter the vend price. The customer can select one product. If you set it on **"Value"**, the value you will program in the next step will be sent to the board. If the value is lower than the vend price, the customer can add money to complete the sale. If the value is higher than the vend price, the sale can be done but no change will be dispense.

Token value —

If you have set the previous parameter to "Value", you must assign that value here. To increase, press on the green button. To decrease, press and hold the green button and press on the black button. The maximum value is $12.75. The setting can wrap around. Therefore, if you are at $0.00 and wish to fix a value of $12.75, it faster decreasing rather than increasing. A value set at $0.00 will make the changer accepting the token without sending any credits to the board.

Machine ID

It is possible to assign an ID to your machine. The ID in numeric between 000 and 999. This number will appear in the proper field of the DEX transfer. Press on the green button to change it and black to confirm.

Multi Vend — (only visible when no coin changer is connected)

Multi Vend enables you to keep the remaining credit for a additional sales if your machine is NOT equipped with a coin changer and thus unable to give change back. You can set it to YES or NO. If you set it to NO, all credits above vend price will be lost. If you set it to YES, the remaining credits will stay for another transaction until they are all gone.

All settings are now complete. The display now says "Insert Coins" and the current vend price.

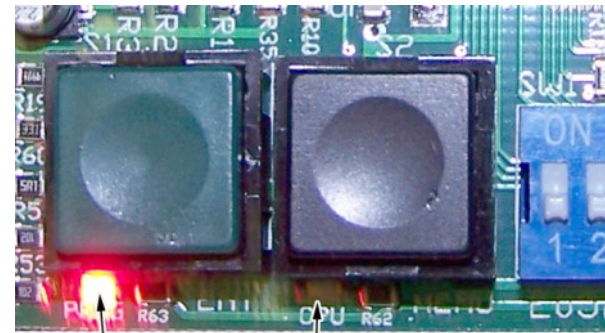## Programming the vend price —

Programming the vend price is done using the dipswitches directly on the board. Those switches work the same way the dipswitches were working in the original coin changer. The base value is on switch #1 (default value 0.05). Switch #2 doubles the value of switch #1. Switch #3 doubles the value of switch #2 and so on. You can use more than one switch to set your vend price. For example, the value of switch #1 + the value of switch #4 + the value of switch #6 = the vend price. The price is visible on the display if you have one.

Programming the SP-1 without an LCD display

As mentioned before, an LCD display is required to program the many features of the SP-1. However, if you happen to be without your programming display, there are still two functions that can be programmed without it. It is the Accept Line L6 and the Multi Vend function (if there is no coin changer connected to the SP-1).

To access the programming of the above mentioned parameters, you must access the hidden menu. Disconnect power to the SP-1. Press on both the Black & Green buttons while applying power. Two bright LEDs will come on while you keep both buttons pressed. Release buttons only when the CPU LED starts flashing very quickly. Then, only the CPU LED will flash once every three seconds. It is telling you that you are currently in the first parameter, which is the Accept Line L6. If the other LED is OFF it means L6 is set to NO. If it is ON, it means it is set to YES. Press on the green button to change the setting either to NO or YES. Confirm with the black button. Both LEDs will flash rapidly while saving the new setting. Then the CPU LED will flash twice every three seconds. It is the Multi Vend settings. If the other LED is OFF it means Multi Vend is set to NO. If it is ON, it means it is set to YES. Press on the green button to change the setting either to NO or YES. Confirm with the black button. Both LEDs will flash rapidly while saving the new setting.

Note that the Accept Line L6 MUST be set to YES in order to have access to the Multi Vend function. You cannot have a Multi Vend function if the Accept Line L6 is set to NO. Furthermore, if a coin changer is connected to the SP-1, the Multi Vend function is not available at all no matter the L6 setting.

Programming LEDs

The audit

The SP-1 keeps track of sales in monetary and unit values. It also keeps track of the money present in the tubes of the coin changer, the coin box and the bill box. Sales done using cash are apart from the sales done using cashless. The same applies with sales done with tokens and/or coupons.
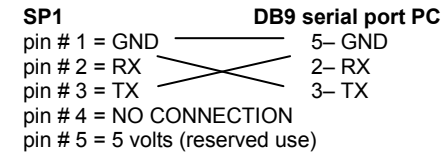
Some of those internal meters can be reset upon each visit. Others cannot. Below are the details of all the internal counters. Please note the example below shows a SP-1 with a Canadian Level 3 MDB coin changer and bill acceptor and a cashless device. Depending on the type of peripherals and the country you are in, the information will vary accordingly.

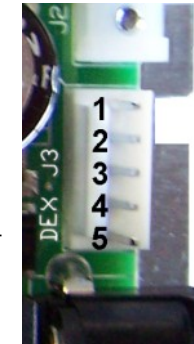|		
Tube ¢ 05	Value of the nickels in the tube	Non-resettable
Tube ¢ 10	Value of the dimes in the tube	Non-resettable
Tube ¢ 25	Value of the quarter in the tube	Non-resettable
Tube $ 01	Value of the one-dollar coin in the tube	Non-resettable
Tube $ 02	Value of the two-dollar coin in the tube	Non-resettable
Coin box:	Value of the coins in the coin box	Press Green to clear
Bill box	Value of the bills in the bill box	Press Green to clear

Cash sales tot	Sales with cash since last clear	Press Green to clear
Cash sales cumu.	Cumulative sales with cash since day one	Non-resettable
Cashless sales tot.	Sales with card since last clear (SP-1plus only)	Press Green to clear
Cashless sales cumu.	Cumulative sales with card since day one (SP-1plus only)	Non-resettable
Sales with token total	Units sold with token since last clear	Press Green to clear
Sales with token cumu.	Units sold with token since day one	Non-resettable
Sales w/value tk total	Value sold with token since last clear	Press Green to clear
Sales w/value tk cumu	Value sold with token since day one	Non-resettable
Unit sales total	Units sold since last clear	Press Green to clear
Unit sales cumul.	Units sold since day one	Non-resettable

On the SP-1plus version, the audit is also available for DEX transfer. Just connect your DEX transfer handheld computer to the port to capture the information.

If you need to adapt your DEX harness, the pin-out information is below.

SP1   **DB9 serial port PC**
pin # 1 = GND ——————— 5– GND
pin # 2 = RX ⤬ 2– RX
pin # 3 = TX ⤬ 3– TX
pin # 4 = NO CONNECTION
pin # 5 = 5 volts (reserved use)

The DEX header (J3) is located beside the MDB connector.

To pass from the SP-1 to the SP-1plus you must change the entire circuit.

Add-on:

Starting with version 2.2, it is now possible to keep on navigating in the programming using the escrow button of the machine. Press on the black button to start and keep on with the escrow.