Introduction

Thank you for purchasing the SP-K Single-Price Interface Kit for Single Price type application. This interface is quite simple to install and operate. The LCD display will enable you to program the basic function and retrieve accounting information such as the value in the coin tubes of the changer and the sales. The SP-K Single-Price Kit has the DEX and Cashless functionalities.

It works with a new state-of-the-art MDB coin changer and other MDB peripherals such as a bill acceptor or a cashless system.

The SP-K Single-Price Kit can work in any country in the world providing you connect the proper coin changer and bill acceptor. The SP-K 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-K 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.

The SP-K Single-Price Interface 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 long harness with loss wires to adapt to your specific machine.

Option:

- 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.
- A selection button #A09980

The SP-K works with...

The SP-K Single-Price Interface works with one or more of the these peripherals:

Coin changer MDB: (Coinco, Conlux, MEI, NRI, some others as well)
- 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:
- The majority of MDB bill acceptors of any country.

Cashless:
- The majority of MDB cashless devices on the market, prepaid or credit. (the SPK offers only one Cashless port, not two)

How does it work?

The SP-K Single-Price Interface can work in conventional vending machine mode or in value-adding station if a prepaid card system is present. In the latest case, a selection button is required. If you do not have a selection button, you can revalue a card. Once the amount inserted or the value on the card is equal to the vend price or higher, the credit relay will click briefly closing a contact between Lines 7 & 6 while opening the contact between Lines 7 & 5. The time this credit relay will stay active is programmable (see Vend Signal Time) as well as the number of time this relay will activate (see Pulse per Vend). This dry contact closure will activate some sort of device in your machine. Once this is done, the customer CANNOT cancel the transaction. The customer MUST make a choice if choice there is. Depending on the wiring of your machine, the SP-K will inhibit the insertion of additional money until the current transaction is completed. This is achieved by Line 4 on the SP-K (see wiring diagram). Normally, once the product or service delivered, the machine should tell the SP-K to enable insertion of money.

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 remaining credit will stay in the memory of the SP-K enabling additional deliveries until all credits are used. Consult the Multi Vend parameter.

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

**DO NOT APPLY 220 VOLTS TO THE SP-K !**
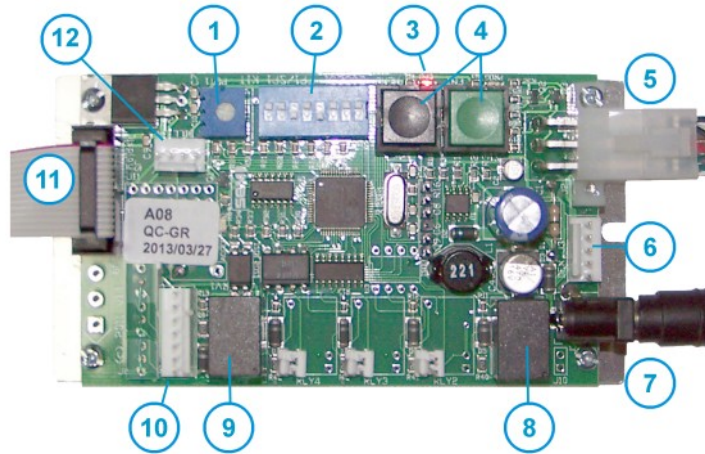
Description of board

1. LCD display intensity adjustment (POT 1)
2. Price setting switches (SW 1)
3. CPU LED (flashes after initialization)
4. Programming buttons
5. MDB connector (J2)
6. DEX connector (J3)
7. 24-volt DC input (J1)
8. Credit relay (RLY 1)
9. Exact change relay (RLY 5)
10. Header to harness for your machine (J7)
11. Flat ribbon to display (J5)
12. Selection Button connector (required when revaluing cards allowed)

Installing the SP-K Single-Price Interface

Installing the SP-K Single-Price Interface 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 or perform a task.
- **Disconnect the machine from the wall or shut off main power switch.** Make sure there is no power before starting anything.
- Find a place where you can fix the circuit board and the power supply. Make sure no harnesses or wires will interfere with the coin insertion, and the coin return arm, or any other moving parts. Make sure the board cannot move.
- Connect to your machine using the harness with loose wires (J7).
- Install the MDB coin changer and fill the coin tubes to the top.
- Install any other MDB peripherals (bill acceptor, cashless device).
- Connect all MDB devices together (Y harness) and then to the SP-K.
- Install the LCD display by following the instruction coming 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.
- Find a place **AFTER** the main switch of the machine to capture the 120-volt for the power supply. Capturing power before the main switch keeps the SP-K energized when that switch is turned OFF. **Danger!**
- Once everything properly connected and secured, apply power. A red LED will flash on the SP-K after the initialization.
- Program your SP-K according to your specific requirements (language, prise base, vend price, etc.).
- Make multiple tests.
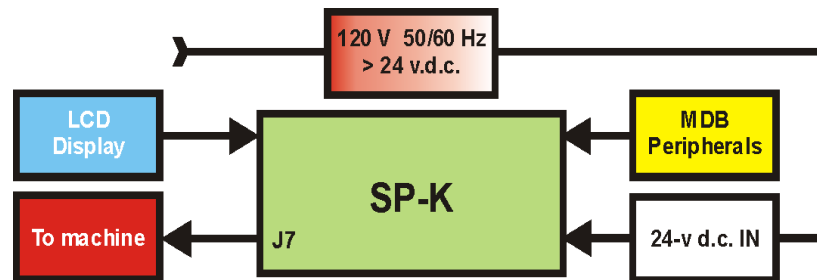
## Connecting the SP-K to your equipment

Connecting the SP-K to your equipment is done using the harness that connects to J7. This harness has loose wires. The minimum of wires you can use is two. They are #6 (N.O.) and #7 (Common). The maximum is six wires. As seen below on the two diagrams, the vend relay on the SP-K is only a dry contact closure. The SP-K will not send any voltage or signal. The other wires are for instructing the SP-K when to accept payment and the Exact Change indicator. If you have programmed Accept Line L4 to YES, your machine must tell the SP-K when to accept payment. If it was set to NO, there is no need to connect the accept line.

The first diagram shows <u>your equipment</u> sending a voltage (12-24-v ac/dc) to the accept line (between #2 and #4) when it is ready to accept payment. The second diagram shows a special harness (#A09840) with a 24-v.d.c. Output.

In both diagrams, there is an Accept Line Switch located in your machine and it will be activated when your machine is ready to accept payment. If the switch is not activated like visible in both diagrams, payment will not be accepted.

Both diagrams show also a small Exact Change Light that will go on when the change level is very low. This light indicator is not required if you have the LCD display as the low change warning will be visible on that display. In Exact Change situation, you will hear a relay clicking once every second on the SPK.

Connexion using an external voltage (12-24 v ac/dc) for the accept line and the exact change light
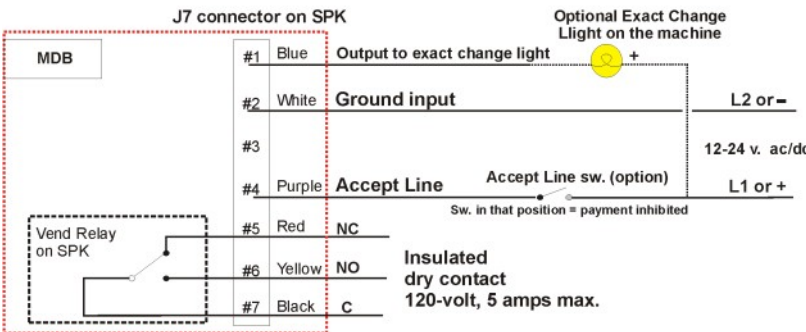
Connexion using the optional A09840 harness 24 vdc for the accept ligne and the exact change light

---
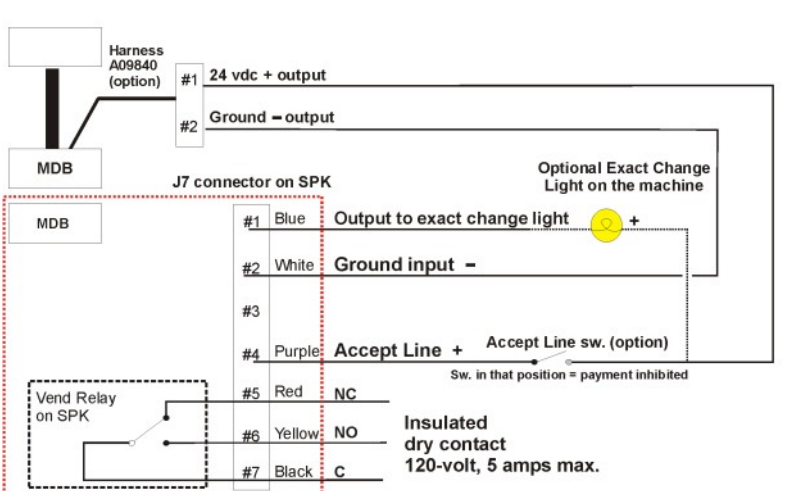
Snubber filter

Snubber filters are used in electrical systems with an inductive load (solenoid, motor) where the sudden interruption of the current flow would lead to a sharp rise in self-inducted voltage across the device creating a brief or permanent failure of the SP-K. The filter prevents this undesired self-inducted voltage by conducting current around the device. This is especially important if the circuit breaker feeding the controlled device is the same as the SP-K or if the load is so important that it can induce a voltage in the wiring leading to the SP-K. The value of the snubber components will vary depending the load (voltage, current, etc.) The snubber will then go in parallel with the load. Snubbers available from S.E.M. are usually made of the following: 33 ohms, ½ W in series with a 1µf 275 volts condenser (part # A00390).
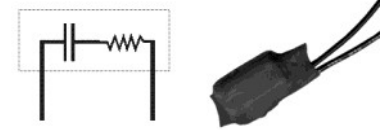
Programming your SP-K Controller

Programming the SP-K requires the LCD display. The display is an LCD 2-lines by 16 characters.

To access the programming of the different parameters, you must access the hidden menu. Disconnect power to the SP-K. 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. <u>Parameters referring to a missing MDB peripherals will be ignored (i.e. No bill acceptor = no mention of bills anywhere).</u>

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

As the SP-K works in many countries around the world, it must adapt to the price level in each country. To achieve this goal, we added a interesting 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 base 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. It is normally equal to the lowest value coin the coin changer canl accept. Of course, the higher the price base, the higher you can go in the vend price.

Next are some examples of the values you can get depending the Price Base value. The yellow column is the default value with an American and Canadian coin changer. Note that if you set the Price base at $1 it will not be possible to have a vend price with cents. A $1.50 vend price will then be impossible (see the $1 column).

Price base	$ 0,05	$ 0,25	$ 0,50	$ 1,00	$ 5,00	$ 10,00	$ 12,75
Sw. 1	0,05	0,25	0,50	1,00	5,00	10,00	12,75
Sw. 2	0,10	0,50	1,00	2,00	10,00	20,00	25,50
Sw. 3	0,20	1,00	2,00	4,00	20,00	40,00	51,00
Sw. 4	0,40	2,00	4,00	8,00	40,00	80,00	102,00
Sw. 5	0,80	4,00	8,00	16,00	80,00	160,00	204,00
Sw. 6	1,60	8,00	16,00	32,00	160,00	320,00	408,00
Sw. 7	3,20	16,00	32,00	64,00	320,00	640,00	816,00
Sw. 8	6,40	32,00	64,00	128,00	640,00	1 280,00	1 632,00
Max. Vend Price	$ 12,75	$ 63,75	$ 127,50	$ 255,00	$1275,00	$2550,00	$3251,25

IMPORTANT! Do not use the Price Base as your primary tool to set the vend price. <u>If you do not need to change the value of the dipswitch #1, leave it the way it is</u> and use the dipswitches as your primary tool for setting

the vend price.

Accept line (L4) —

The accept line (L4) is the signal your machine sends to inform the SP-K that everything is ready and payment is allowed. This line normally goes off if your machine is not in a working condition (i.e. empty or defective), or when the machine is either waiting for the customer to make a choice or currently performing a task. If you set this parameter to YES, you must make the proper connection seen on reverse. If you set it to NO, the SP-K will authorize payment even if the machine is not capable of dispensing a product or currently performing the previous transaction.

Language —

You have the choice between English, French, German, 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.

Multi Vend — *(only visible if NO coin changer connected & L4 set to YES)*

If you do not have a coin changer connected to the SP-K but only have a bill or a coin acceptor, you can set your SP-K to make multiple sales upon a single insertion of money. When set to ON, the SP-K will make as many transactions the amount inserted allows it. Additional insertion of money will not be allowed until the remaining credit is below the vend price (i.e. Vend price $1, remaining credit 95¢). Press the green button to pass to YES. Confirm with black.
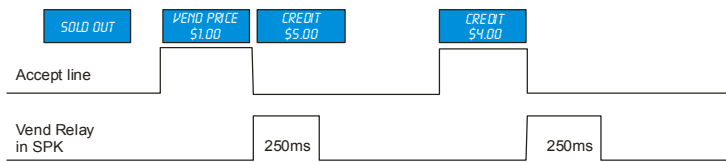
Cashless type —

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.

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"**, one free transaction will be allowed, 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 higher than the vend price, the sale can be done but no change will be dispensed. If the value is lower than the vend price, the customer can add money to complete the sale.

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 is numeric between 000 and 999. This number will appear in the proper field of the DEX transfer. Press on green to increase it, press and hold green while pressing on black to decrease. Press black to confirm.

L4 Time out —

This setting is used to set the time the SP-K will wait for the accept line to return. During this period, the display will show « Please wait ». After this period, the display will show the message « Out of service » or « Sorry sold-out » according to the setting of the next menu. Time is adjustable between 00:04 and 99:59 minutes. Press on green to increase it, press and hold

---

green while pressing on black to decrease. Press black to confirm.

Vend cycle
Blue rectangle represents display of SP-K
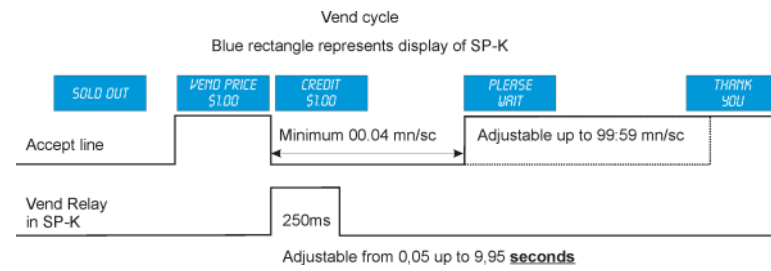
L4 OFF message —

You have the choice between *Out of service* or *Sorry sold-out* when the Accept line is not present following the L4 Time-out set-up time. Press green to change, black to confirm.

Pulse per vend —

Allows you to decide how many time the vend relay will open and close for one single transaction. Maximum 99 pulses.

Vend signal time —

Enables you to program the time the vend relay will close once the amount inserted is equal or higher that the vend price. Time is by increments of 0,05 seconds. Minimum is 0,05; maximum is 9,95 In case on multiple pulses, close time = open time.

Selection button —

If you allow revaluing cards in your machine, you must have a selection button and this parameter must be set to YES. The selection button can be used without a card reader such as allowing a delayed start of your machine. No button = automatic start.

Max card revalue —

Enter here the maximum amount you authorize for the function revalue. The amount set here will not modify the maximum programmed into the cashless device itself and must be lower that this one by at least $20 (ex.: maximum amount into the reader $100; set an $80 maximum amount here).

$accept vending *followed by* $ accept revalue —

If you have a bill acceptor, you can decide the bills you wish to accept either for a purchase or a revalue. Note that adding value to a card is only possible using bills. You can't revalue with coins.

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 single price coin changer.

If you are not familiar with this, keep in mind the following word: **Doubles**

The base value is on switch #1 (default value 0.05 or 5¢, see Price Base on reverse).
Switch #2 doubles the value of switch #1 (2 x 5¢ = 10¢).
Switch #3 doubles the value of switch #2 (2 x 10¢ = 20¢).
Switch #4 doubles the value of switch #3 (2 x 20¢ = 40¢).
Switch #5 doubles the value of switch #4 (2 x 40¢ = 80¢).
...and so on.

You can use more than one switch to set your vend price. If you want to set a $1 vend price, use switch #3 (20¢) + switch #5 (80¢) = $1,00. A 75¢ vend price would see switches 1, 2, 3, and 4 ON (5¢ + 10¢ + 20¢ + 40¢ = 75¢). A $2 vend price will see switches #4 and #6 ON (40¢ + $1,60 = $2).

The price resulting from the combination of the switches is visible on the display.

All switches ON will give the maximum vend price of $12,75 (5¢ + 10¢ + 20¢ + 40¢ + 80¢ + $1,60 + $3,20 + $6,40 = $12,75). If you want to go higher, you need to change the default value of switch #1. To do so, consult the chart in the Price Base parameter on reverse.

The audit

The SP-K keeps track of all sales. It also keeps track of the money present in the coin changer, the coin box, and the bill box. Sales in cash are apart from the sales in cashless as well as sales done with tokens and/or coupons.

Some of those meters can be reset upon each visit. Below are the details of all the counters. Please note the example below shows a SP-K with a coin changer, a bill acceptor, and a cashless device. Depending on the absence or the type of peripherals and the country you are in, the information will vary accordingly.

Tube ¢	Value of the coins in each tube (3 to 5)	Non-resettable
Coin / Bill box:	Money present in each box (coin and bill)	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 1	Non-resettable
Cashless sales tot.	Sales with card since last clear	Press Green to clear
Cashless sales cumu.	Cumulative sales with card since day 1	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 1	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 1	Non-resettable
Unit sales total	Units sold since last clear	Press Green to clear
Unit sales cumul.	Units sold since day 1	Non-resettable
Card revalued Total	Value of the money sent on cards since the last clear.	Press Green to clear
Card revalued cumul.	Value of the money sent on cards since day 1.	Non-resettable

Clear all meters

Once you have consulted the audit, you can clear all meters in one operation. When the display shows **Clear Counters? Hold GREEN**, you must then press and hold the green button for few seconds. If you release too soon, nothing will be cleared. The cumulative counters are not touched by this manoeuvre.

A word on the DEX transfer. A DEX transfer of the audit through the DEX port **will not** erase the counters. You must erase those manually after the transfer.

On the SP-K, 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.