

Logic board RVM72A

GPE Vendors

Update 07-12-2007

General Characteristics

Sales of products

The board is predisposed for direct connection to a maximum of **8 trays** with **9 spirals** per tray. The correct dispensing of the product is assured by the patented "**GPE System**" which controls the rotation of the spirals at **$360^\circ + X^\circ - X^\circ$** where X is programmable for each spiral.

The **graphic display** allows a simple and efficient use of the machine. The ample dimensions of the display lend to a clear and detailed visualization of all texts with the possibility of contemporaneous translations in a **second language** of your choice.

It is possible to personalize the operations on the display including visualization of the status information, time and date, temperature and a maximum of **8 publicity Spots** designed and downloaded onto the machine by PC.

Accounts and registration

Each of the 72 possible products is equipped with a **sales counter** and a **products remaining counter**. It is also possible to specify the **valid days** of each product to inhibit sales of expired products.

The **total sales counters** allow the registration, even singularly, of each coin along with the direct visualization in **real currency**.

The programming of the prices is also expressed in real currency with relative decimals and currency symbols for an immediate understanding of the values of all costs.

The **data-logger** system allows the automatic registration of any machine operation. Up to more than 1700 records in text format allow the memorizing for each vend of the time and date, the number of the selection, the remaining and actual takings, etc. A progressive reading system of these records by PC allows the archiving on file, in unique mode, of the detailed information of each vend for the whole life of the machine.

Clock functions

The clock/calendar of the logic board allows not only the eventual visualization of the current time and date on the display and the registration of events using the data-logger, but permits the management of **turning on and off the refrigerator, the display cabinet** and the display depending on opportune programs. A maximum of **16 programs** describe the operations of turning on and off by correspondence masks which run from the value of the seconds to those annual.

Elevated programming and personalization

The RVM72A is the only electronic board where it is possible, by PC, **to modify as required** all the texts in all the languages, the graphic fonts, the graphic icons, the Spots and the 3 default tables.

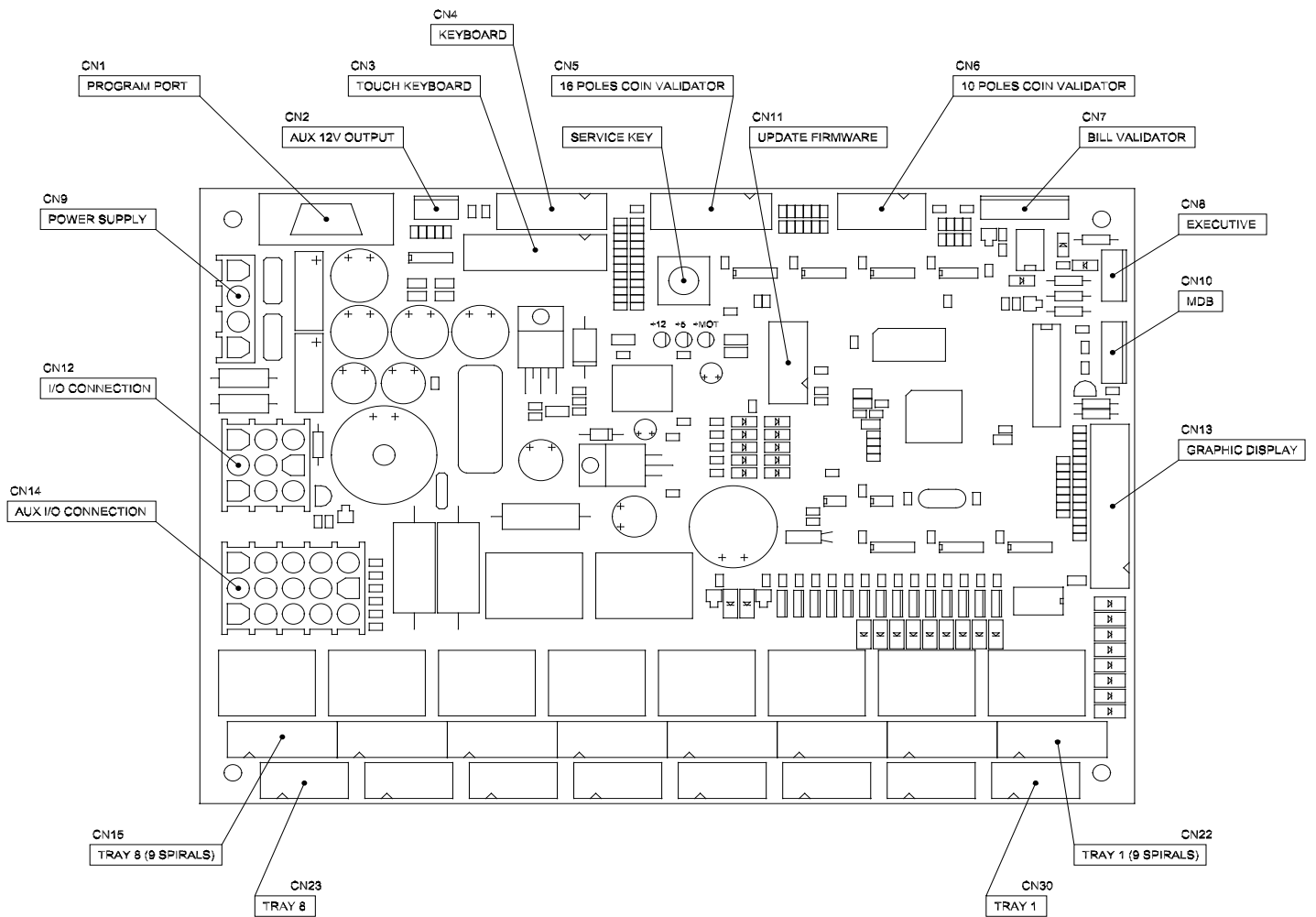
A computer software facilitates the reading, writing and archiving on file of all current working parameters of the machine, in alternative to the manual programming with the keypad and display.

By PC it is also possible to **update the software** of the microprocessor directly onto the board.

Total compatibility of the board

The logic board RVM72A is mechanically and electrically compatible with the DRF35A board except for the display which is substituted by a dimensionally bigger graphic display.

General information on the logic board



Connection of the payment systems

A parallel coin mechanism can be connected to the 10 pin connector CN6 or to the 16 pin connector CN5. These connectors supply, respectively, a power supply of 12V and 24V to the coin mechanism. A parallel bill validator can be connected to the connector CN7 that can also supply a 12V power. A serial payment system with Executive protocol can be connected to connector CN8 or with MDB protocol to connector CN10.

The parallel coin mechanism and bill validator can be used contemporaneously with the serial (Executive or MDB) payment system.

Verifying and modifying of the working parameters

To enter the service menu press the “service key” indicated in the diagram for 1”.

To return to the normal state of vending of the machine press again this key or digit on the keypad “Esc” (9) and confirm the selection with the “OK” (8) key.

Set up of default parameters

The board, for its functioning, avails of more 900 different working parameters. Normally it is necessary to modify only a few depending on specific needs. However, it is possible to automatically re-install these parameters with the values contained in 3 distinct default tables.

To set-up one of the default tables you must turn the machine on whilst pushing down the “service key” and the key “1” or “2” or “3” depending on the table.

Service menu

Use of the keypad

All of the service and programming functions of the working parameters are accessed through the use of the keypad of the machine.


Keep the “**Help**” (3) key pressed down to visualize the current functions of the keys in that particular menu or sub-menu:

1 ↓	2 ↑	3 Help
	8 OK	9 Esc

The keys “1” and “2” allow the selection of one of the voices of the menu.

The “**OK**” (8) key confirms the choice of the menu, whilst the “**Esc**” (9) key is for exiting from the menu.

Once you have entered into a specific sub-menu of visualizing and modifying of parameters the other keys come into use:

1 ↓	2 ↑	3 Help
4 +	5 -	6 Def
7 	8 OK	9 Esc

Keys “1” and “2” allow the selection of a specific parameter.

Keys “4” and “5” modify the current value of the parameter. It is possible to quickly select and modify the values keeping pressed down the relevant key. Different levels of speed will be progressively and automatically recalled for a quick arrival to the requested value.

The “**Def**” (6) key recalls the default value of the only parameter to be modified, using the respective value of the last used default table (of the 3 possibilities).

In each case, when the value has been modified with keys “4” and “5”, or the default value has been recalled, you must definitively confirm the modification of the parameter with the “**OK**” (8) key. The attention for this confirmation is called by the “**OK ?**” text flashing on the display which indicates that the actual value memorized in the parameter memory of the machine is still not the same as that prepared. By pressing “**Esc**” (9) without confirming the parameter will not be modified.

The “**Copy**” (7) key allows the **copying of the same value to the following parameters** belonging to the same group. For example, to set-up the same price for different products, modify the price of product 11, position on the following product 12 and press the key “7”. Automatically, the same price of product 11 will be copied and confirmed to product 12 and automatically the position shifts to product 13 to continue this operation for all the following products.

An analogue procedure can be carried out to contemporaneously copy **the same value to all following parameters relative to an entire tray**. For example, once the price for product 11 has been modified and positioned on 12, press key “7” for at least 1”.

The copy function as described above will be automatically repeated for all of the products of the current tray. At the end, the position will shift to the first product of the next tray.

“Products load” Menu

- Reload all
- Products stock
- Stock values reload
- Products expiry days
- Expiry days reload

“**Product stock**” has 72 counters relating to each possible product which decrease by 1 every time that specific product has been dispensed.

“**Products expiry days**” has 72 counters relating to each possible product which decrease by 1 with each passing day.

“**Stock values reload**” has 72 values which can be set-up for the quick reload of all values of the counters type “Products stock”.

“**Expiry days reload**” has 72 values which can be set-up for the quick reload of all values of the counters type “Products expiry days”.

“**Reload all**” allows the rapid reload contemporaneously of the current values of the counters with the reload values.

However, it is possible to modify manually and in any moment the current values of the counters to adapt them to a particular actual situation without having to resort to the reload in bulk.

In particular, when the “Reload all” command is carried out, the time of reload is re-synchronized, used as a reference to the passing days. For example, carrying out this command at 16:30:00 on a certain day, 16:30:00 of the following day will be taken as one day passed and so on.

When an expiry of product reaches 0 days, the sale of this product is inhibited.

Setting to “unlimited” the days of the “Expiry days reload” of a certain product disables the management of the expiry for that product and the relative expiry product counter will also show the value of days “unlimited”.

“Vend counters” Menu

- Delete counters
- View counters
Partial tot. vends

“**View counters**” has 72 partial counters (that can be zeroed) of the sales relative to each single product which increase by 1 every time that specific product is dispensed. Also, at the end of this list the visualization of a total vends counter of an absolute type (that can't be zeroed) is available.

“**Partial tot. vends**” directly visualizes the sum of the actual values of all partial counters and so represents a total vends counter of the partial type (which can be zeroed).

“**Delete counters**” is a command that allows the zeroing of all partial vend counters.

“Taking counters” Menu

- Delete counters
- View counters
Partial tot. takings

“**View counters**” is the combination of the partial counters (which can be zeroed) of the takings relative to the 6 coin channels of the parallel coin mechanism, of the 4 channels of the parallel banknote reader, the Executive and MDB serial payment system. For MDB coin changer are available one payout counter for every type of coin, while for cashless systems are available the total of revalued credit. Also, an ulterior partial counter totals the remaining costs of the coin mechanism and banknote reader which have been annulled (where this operation is qualified).

At the end of this list is available the visualization of a total counter of the takings of an absolute type (which can't be zeroed).

“Partial tot. takings” visualizes directly the sum of the actual values of all partial counters and thus represents a total counter of the partial type takings (which can be zeroed).

“Delete counters” is a command that allows all the partial counters of the takings to be zeroed.

“Info counters” Menu

- Delete counters
- View counters

“View counters” is an amalgamation of all partial counters (that can be zeroed) of the recurring possible anomalies which can occur during the working of the machine.

The visualization of an absolute total counter is also available (which cannot be zeroed) of the working time of the machine in seconds with a 10 minute (600”) resolution.

“Delete counters” is a command which allows the zeroing of all partial anomaly counters.

“Product prices” Menu

This menu allows the set-up of prices in real currency of all 72 possible products. It should be noted that the values can be varied by quantity equal to the base coin, making it important to select in the correct mode this unit.

There are two special price values indicated by **“free vend”** and **“not used”** included in the list between maximum price and minimum price. In particular the “free vend” price allows the selling of that product even in the absence of credit, whilst the “not used” price disables the sale of that specific product.

“Products config.” Menu

- Spirals rotation
- Lift altitudes
- Age verify enable
- Disk machine config.

With this menu it is possible to configurate the parameters and the options relating to the dispensing of the product.

“Spirals rotation” contains the 72 values relative to the extra rotation of the spirals. The patented **“GPE System”** permits the rotation of the spiral superior to 360°, programmable for each spiral. After this extra rotation, the spiral inverts direction and returns exactly to 360°. An automatic control system allows to bring the spiral under phase in the event of, for example, a power cut during the rotation.

“Lift altitudes” allows the modification of the position of the (optional) lift in correspondence to the trays in the machine.

“Age verify enable” enables for a specific tray the optional function of minors vending inhibit.

“Disk machine config.” contains the parameters relative to the use of the logic board for disk machines, not spiral ones. In this menu only the option to activate the double impulse is available.

“Payment config.” Menu

- General config.
- Parallel systems
- Executive systems
- MDB systems

“**General config.**” gathers all parameters relative to the payment systems that are commune to all types of coin mechanism. In this submenu is the **free vend** option for all products, the value of the **coin unit**, the number of **decimal digits** and the **currency** symbol to be used in the visualization of all costs.

There is also available the option of automatic annulment of the remaining credit (only from parallel systems and not executive systems) with relative zeroing time.

Serial protocol select Executive or MDB payment systems.

“**Parallel systems**” is the amalgamation of values, in real currency, relative to the 6 coin channels of the parallel coin mechanism and the 4 channels of the parallel banknote reader.

“**Executive systems**“ allows the activation of the “Price Holding” option of the Executive payment systems. It is also available the programming of the 72 “price lines” relative to all possible products. Remember that the value of the “price lines” is a value relayed to the Executive system (to identify the product) in alternative to the effective value of the price only when the “Price Holding” option is activated.

In this way the coin mechanism, noting the requested product, determines the real price of sale through its price table. It is necessary to set-up the same prices on the logic board of the machine (with the relevant menu) as set up on the coin mechanism just for the correct visualization and management of the sale.

“**MDB systems**” allows the selection of single coin acceptance and payout. The payout mode select **single-vend** (payout after a vend), **multi-vend** (payout after a vend and if push button is pressed or the programmed timeout is elapsed) or **coin-changer** (payout every time the push button is pressed) functionality of the machine. Enabling and disabling coins acceptance/payout is possible to convert some type of coins to another.

The maximum payout parameter limits the coins dispensing while minimum coins level is a further margin (added to that inside to the coin changer) only for viewing the exact change alert.

The bills security option configures a high security acceptance of bills.

Note: while a service menu is active the coins inserted into MDB coin changer are not accumulated. This is important if a coins fill menu is not available inside the coin changer.

The maximum cashless revalue parameter limits the available credit transferred into the key (this maximum is also compared with that inside to the system). The available credit automatically moves to the key to its insertion, while if the key is already inserted, the credit is contemporarily transferred.

“**General config.**” Menu

This menu unites different parameters of configuration of various parts and functioning of the machine.

We have the activation of the **cooler group** with relative set-up of the temperature and the option to block vends in the event of the temperature being too high in respect of that programmed.

It is possible to program the **primary language** of the display and activate an eventual **double language** of choice to visualize the contemporaneous translation of all texts present during a vend.

It is also possible to personalize the visualization of the graphic display during a vend.

In particular you can deactivate the current **credit visualization** in the sales scheme, activate the **temperature visualization** and activate the **date/time visualization**. All of these visualizations, and other eventual warning signs that can appear in particular situations, appear in sequence and with a time programmable from the “Status view time” parameter.

A characteristic of the board is that to alternate the previous sequence of the status scheme with a certain number of “**Spots**” . These are full screen graphic images which can be designed using any graphic program on a PC. You will need to create a file for each Spot of the BITMAP type, monochrome with resolution 128x64 and download to the board using the relevant software on a PC with a normal serial cable RS232. At this point it is enough to program the number of seconds of visualization requested for each Spot. Up to 8 Spots can be downloaded to the board and kept at disposition for activation on particular occasions.

Available in this menu are other parameters such as an **identity number** for the machine and a **communication address** for the programming portal (for the management of more than one machine with the same PC or other method of external supervision).

The **“Machine model”** parameter must be programmed depending on the particular machine so that the board can manage in the appropriate way all specific functions.

The **“Operator Code”** permits a number to be programmed to be used as a password for access to the machine menu. A code equal to 0 deactivates the request for the password whilst it is possible to insert a number using all 10 numbers from 0 to 9. When the password is requested the keypad can be used to digit the value directly. The keys from 1 to 5 have a second function when the **“Shift”** (7) key is pressed:

1 / 6	2 / 7	3 / 8
4 / 9	5 / 0	
7 Shift	8 OK	9 Esc

Note: entering the principal service menu with the appropriate key when a password has been programmed, the introduction of the code is requested. Here there are two possibilities. Pressing directly **“OK”** (8) enters the principal menu without password and in this case certain menus will not be accessible without later inserting the password. Instead, inserting the correct password using keys **“1”-“5”** and **“Shift”** all menus will be accessible up to exiting the service menu.

“Watch settings” Menu

- Date/time settings
- ON/OFF prog. setting

“Date/time setting” allows the regulation of the date and current time on the machine clock. This clock is used for various machine functions. Apart from visualizing in the pause between vends, the clock is used to update the expiry of the products (when used), to manage the turning on and off of the different parts of the machine according to certain programs and to provide the data-logger records of the time/date information on particular events.

“ON/OFF prog. setting” contains a list of 16 programs to turn on and off the cooler group, the display case illumination and the display. If the illumination has been turned off by a program, it is possible to momentarily turn it back on again pressing any key on the keypad and thus allowing a vend.

Each on/off program consists of a total of 8 fields of which the first 7 identify a particular condition of time/date whilst the last is of the on/off status desired departing from that time/date. The programs are constantly verified departing from program 1 up to program 16. All programs in which the time/date is verified (the current time/date is the same or more than that of the program excepting the field **“Day of week”** which requires the program only of equality) define as valid their on/off status. Consequentially, if more programs see their condition of time/date verified, the valid on/off status will be that of the last verified program and so the priority is more as much as the number of programs is more.

In defining the time/date condition of a program the use of the value **“whatever”** is very important to specify that that field is not important for that condition. Programming the field **“Year”** to 2099 makes the relevant program un-influential in that, independent of other fields, the condition will not be verified until 2099.

Some examples of programs:

Example 1. Needs a weekly program the same for all the weeks of all the years:

Monday-Friday from 8:30 to 18:30 all access
 Saturday-Sunday all off

Prog.	Day of week	Day of month	Month	Year	Hour	Minute	Sec.	ON/OFFstate
1	*	*	*	*	8	30	*	ON-ON-ON
2	*	*	*	*	18	30	*	OFF-OFF-OFF
3	Saturday	*	*	*	*	*	*	OFF-OFF-OFF
4	Sunday	*	*	*	*	*	*	OFF-OFF-OFF
5	*	*	*	2099	*	*	*	*
6	*	*	*	2099	*	*	*	*
7	*	*	*	2099	*	*	*	*
8	*	*	*	2099	*	*	*	*
9	*	*	*	2099	*	*	*	*
10	*	*	*	2099	*	*	*	*
11	*	*	*	2099	*	*	*	*
12	*	*	*	2099	*	*	*	*
13	*	*	*	2099	*	*	*	*
14	*	*	*	2099	*	*	*	*
15	*	*	*	2099	*	*	*	*
16	*	*	*	2099	*	*	*	*

Example 2. Needs a weekly programming the same for every week of every year:

Monday-Friday from 8:30 to 18:30 all access
 Saturday from 9:30 to 13:30 all access
 Sunday all off

Prog.	Day of week	Day of month	Month	Year	Hour	Minute	Sec.	ON/OFFstate
1	*	*	*	*	8	30	*	ON-ON-ON
2	*	*	*	*	18	30	*	OFF-OFF-OFF
3	Saturday	*	*	*	*	*	*	OFF-OFF-OFF
4	Saturday	*	*	*	9	30	*	ON-ON-ON
5	Saturday	*	*	*	13	30	*	OFF-OFF-OFF
6	Sunday	*	*	*	*	*	*	OFF-OFF-OFF
7	*	*	*	2099	*	*	*	*
8	*	*	*	2099	*	*	*	*
9	*	*	*	2099	*	*	*	*
10	*	*	*	2099	*	*	*	*
11	*	*	*	2099	*	*	*	*
12	*	*	*	2099	*	*	*	*
13	*	*	*	2099	*	*	*	*
14	*	*	*	2099	*	*	*	*
15	*	*	*	2099	*	*	*	*
16	*	*	*	2099	*	*	*	*

Example 3. Needs a weekly programming the same for every week of every year:

Monday from 8:00 to 16:00 all access
 Tuesday from 8:15 to 16:15 all access
 Wednesday from 8:30 to 16:30 all access
 Thursday from 8:45 to 16:45 all access
 Friday from 9:00 to 17:00 all access
 Saturday from 9:15 to 17:15 cooler ON, show and display OFF
 Sunday from 9:30 to 17:30 cooler ON, show and display OFF

Prog.	Day of week	Day of month	Month	Year	Hour	Minute	Sec.	ON/OFFstate
1	Monday	*	*	*	8	0	*	ON-ON-ON
2	Monday	*	*	*	16	0	*	OFF-OFF-OFF
3	Tuesday	*	*	*	8	15	*	ON-ON-ON
4	Tuesday	*	*	*	16	15	*	OFF-OFF-OFF

5	Wednesday	*	*	*	8	30	*	ON-ON-ON
6	Wednesday	*	*	*	16	30	*	OFF-OFF-OFF
7	Thursday	*	*	*	8	45	*	ON-ON-ON
8	Thursday	*	*	*	16	45	*	OFF-OFF-OFF
9	Friday	*	*	*	9	0	*	ON-ON-ON
10	Friday	*	*	*	17	0	*	OFF-OFF-OFF
11	Saturday	*	*	*	9	15	*	ON-OFF-OFF
12	Saturday	*	*	*	17	15	*	OFF-OFF-OFF
13	Sunday	*	*	*	9	30	*	ON-OFF-OFF
14	Sunday	*	*	*	17	30	*	OFF-OFF-OFF
15	*	*	*	2099	*	*	*	*
16	*	*	*	2099	*	*	*	*

Note: the character * signifies "Whatever".

Consider that the on/off status associated with a program is represented by 3 icons (one for the cooler, one for the illumination of the show and one for the illumination of the display). The on/off status of the program corresponds to one of the 8 possible combinations of on/off of all 3. For example:



indicates respectively: cooler ON, show ON, display ON



indicates respectively: cooler ON, show OFF, display OFF

“Machine test” Menu

- Trays test
- Lift test
- Flap test
- Photocell test
- Board test

“**Trays test**” consents the cyclical testing of all the spirals of all the trays. Remember that all spirals for which the price is set at “not used” are excluded from the test.

“**Lift test**” continually tests the lift where this option is available.

“**Flap test**” opens and closes continually the protection flap in the retrieval window.

“**Photocell test**” allows to verify the manual simulation of the passing of the product in front of the optical sensor where this option is present.

“**Board test**” allows the direct activation of a specific spiral (select spiral with keys “1” and “2” and power on with key “3”) and of a specific auxiliary output (select spiral with keys “3” and “4” and power on with key “5”). Key “7” views all inputs current states.

To end any test press the “Esc” (9) key.

Other functions of the logic board

Data-logger of events

The board avails of an automatic register of events. The events are memorized in the form of lines of text in the internal of which there is different useful information on the event itself. Connecting a Personal Computer to the CN1 connector for programming the board using a standard serial cable it is possible to read this information and save it to a text file.

Normally, each event is a line of text in the file.

An example of 4 events follows:

```
1 22/04/2006 15:29:56 SERVICE: Enter
2 22/04/2006 15:29:58 SERVICE: Exit
3 22/04/2006 15:30:24 VEND:   Product=11 Vends=1      Stock=13   Abs_Takings=10   Abs_Vends=1   Temp=12.5°C
4 22/04/2006 15:30:42 VEND:   Product=12 Vends=1      Stock=13   Abs_Takings=20   Abs_Vends=2   Temp=12.4°C
```

Each record begins with a progressive number of identification of the event followed by the time and date of registration of said event.

The next column represents the type of event. In this example the event number 1 indicates a service entry of the board whilst event number 2 relates to the exiting from the service menu.

Successively, the machine has vend with success product number 11. After this vend, the partial vends counter of the specific product is raised by 1 whilst the product availability counter descends from the full load of 14 to 13. The absolute counter of takings has totalized 10 base coins, whilst the absolute vends counter has totalized 1. Also, during that particular vend the temperature of the refrigerator was 12.5°C.

It results obvious also the description of the following sale effected on product number 12.

The vend of a product is definitely the most recurrent event in the machine. However, many other events are registered, such as the turning on of the machine and all possible verifiable anomalies. Registration of events is autonomous and automatic and the board is capable of memorizing more than 1700 events (lines) in its permanent memory. The mechanism of registration is equivalent to that of a continuous tape so that, reaching the registration of the maximum number of events, new records will successively take the place of the older ones.

To keep track of all events for the entire life of the machine it is necessary to download periodically with a PC the contents of the memory of the data-logger. The software on the PC will save the current contents of the register on a text file, automatically assigning a name composed of an arbitrary text added to the machine number and the time/date of acquisition. In this way, every acquisition file will be unique, as will be the identity number of each event of the machine. In this way, it is possible to archive on a PC the data-logger files and keep track of each single sale of each machine installed for the duration of said machine.

Programming by Personal Computer

The CN1 programming connector constitutes a serial portal RS232 of access to the board (and thus to the machine) with enormous potential.

This communication portal consents principally to read and write about 900 working parameters of the machine. In this way, it is possible to set-up the functioning of the machine contemporaneously or alternatively to the use of the keypad and display. Having read the parameters of the machine it is possible to modify them and re-transfer to same. Also, the parameters taken can be saved to file and vice versa it is possible to recall from a file a certain batch of values of the parameters to then transfer to the machine. In this way the optimum parameters can be archived to a PC by file (for example using a different name for each machine) to be re-used to configure other machines.

By PC it is also possible to set-up the watch of the machine or read, save to file and visualize the contents of the data-logger.

An innovative characteristic of the board is the possibility to modify and personalize all the graphic images which appear on the display. In particular, amongst these images, there are 8 Spots which can be used for publicity, warnings and information of all types. The Spots are full screen graphic images which require the creation of such files as BITMAP monochrome with resolution 128x64. Programs of image elaboration can be used for their creation (from a simple PAINT to more sophisticated programs such as PhotoImpact). After an opportune operation of conversion, these files can be transferred to the board by a serial portal.

With an analogue procedure all texts (in the various languages) visualized on the display can be modified. This time it is necessary to modify a text file in standard Unicode format. The choice of the Unicode format is decided by the necessity to use a batch of possible characters belonging to Latin, Common Latin, Cyrillic and Greek.

For all precedent programming and personalization functions you will just need a PC with Windows operative system, the software equipped with RVM72A and a standard serial cable. For PC's with just a USB portal, standard commercial adaptor cables USB-RS232 can be used.

Also by PC, it is possible to update the Firmware of the microprocessor of the board, or more precisely the software for the functioning of same developed and periodically updated by GPE Vendors. Just for this update it is necessary to connect a PC to the CN11 connector of the board using the appropriate interface available as an optional.

SD card data reader interface (optional)

An optional interface is available to the purpose of reading machine value by commercial SD card. The usable memories can be of different sizes as 512MB, 1GB and 2GB.

The advantages of SD card memory are:

- Very contained physical dimensions. The memory can easily be transported.
- Boundless capability of memory. With a single SD card is possible to store a lot of reads of all the installed machines.
- Personal Computer direct reading of acquired data files.
- Availability and contained cost thanks to the diffusion in the digital photographic sector.

The data of the machine are contemporarily saved in two different formats:

- **GPE-DATA** format. A file for every machine (with name ID_XXXXX.txt where XXXXX is the machine number programmed in the same one) memorizes the sequential reads in legible text format. This format is directly importable and analyzable in commercial programs like EXCEL.
- **EVA-DTS** format. A file for every machine memorizes a single read in such standard format. For the reading and interpretation a special converter program is necessary.

There are two operational modes for the reading of machine data collection:

- Insertion of the same SD card on more machines and press key for read command
- Daily automatic reads (at a programmed hour) on the SD card installed into the machine

These two modes can also coexist in the sense that on a SD card (with the automatic feature enabled) it is possible to save further reads pressing the key.

It is possible to customize the selection of readed values or groups of values and if the partial counters will be reset at the end of the read.

All the operational modes are stored in the RVM72A.CFG file that must be present in the root folder of SD card. If this file is not present all values in the two formats are saved (in overall 380). If you select only the essential fields, the files created are smaller and more simply to analyze.

To modify the RVM72A.CFG text file you can use any text editors or simply call it from the "Edit configuration" item of "SD card" menu. Please don't change the positions of spacing and format of such file.

Before using a new SD memory card it is necessary to format it using the "Format SD card" menu. This command also copy the RVM72A.CFG file into root folder. Is possible however use the standard disk formatting tool offered by the PC operating system (remember to use FAT16 or generic FAT option).

Once the SD card is inserted into the machine interface, it is necessary to press the key beside the SD plug connector if you want read a single report. If the daily automatic read is selected, the green led will begin to flash for pointing out the activation of such type of read. In every case, when a read is in progress, the green led is off and the red led is on. When it returns green it is possible to extract the SD card unless is not wanted to leave it in the machine for the daily reads.

In case of error the red led will begin to flash according to an established code of flashing:

- 1 flash: the SD card has not correctly been inserted.
- 2 flash: the SD card is write protected. Move the switch on it.
- 3 flash: SD card reading or writing error.
- 4 flash: error related to the management of the files.
- 5 flash: serial error while connecting to the RVM72A board.

For resetting the alarm condition press again the key. If the error is cleared the green led will relight and the red led will go off.

Once the data is acquired it is possible to insert the SD card into Personal Computer. It will open the disk window and will appear the two folders (GPE-DATA and EVA-DTS) containing the files in two different formats. For the EVA-DTS format refer to this standard documentation.

The GPE-DATA format is directly legible text. A start header report the principal characteristics of the machine and then the following lines (one for every read) report reading of date/hour and the selected values.

The various fields of every line are separated by the tabulation character (ASCII code = 9). In case of direct reading with a text editors is sufficient select an elevated number of tabulation spacing for a clear view of the data.

In the case of loading into programs as EXCEL, it is possible to import data directly opening the file and following the automatic procedure.

A simple EXCEL template file is provided as GPE-DATA.xlt (into the folder C:\RVM72A\GPE-DATA) that contains the Auto_Open macro for automatic selection of the acquired file and format of the cells style for a best reading. In such template a plot chart is also predisposed for allowing the analysis of one or more fields of data.

To recall the EXCEL program with such template you can use "Excel import" menu of the RVM72A computer software.

