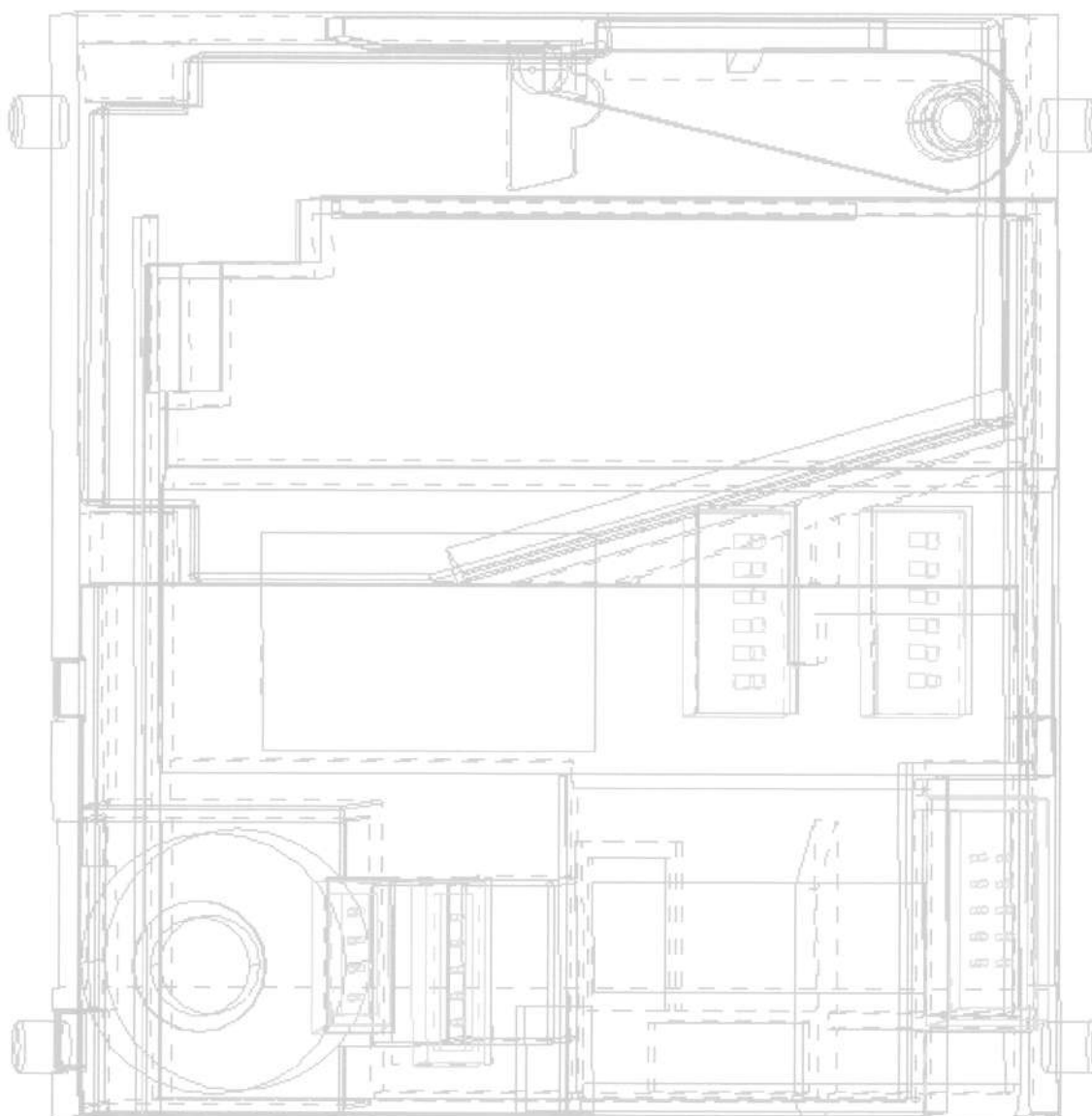




TECHNICAL MANUAL



ELECTRONIC COIN SELECTOR

TYPE AL 05

SUMMARY

1 INTRODUCTION	pag. 3
Schedule 1.1 Comparison between AL05 and AL03 coin selectors' series	pag. 3
2 MECHANICAL VERSIONS	pag. 4
2.1 V Model	pag. 4
Drawing 2.1 V Model	pag. 4
2.2 K Model	pag. 5
Drawing 2.2 K Model	pag. 5
2.3 KS Model	pag. 6
Drawing 2.3 S Model	pag. 6
3 CONNECTION	pag. 7
Drawing 3.1 Scheme of connection and DIP-switch	pag. 7
Drawing 3.2 Scheme of AL05 connector	pag. 8
4 FUNCTIONAL VERSIONS	pag. 8
4.1 VALIDATORS	pag. 9
Schedule 4.1 Function of the validator pins	pag. 9
4.2 TOTALIZATORS	pag. 10
Schedule 4.2 Function of the totalizator pins	pag. 10
4.3 TIMERS	pag. 11
Schedule 4.3 Function of pins of coin selector with timer	pag. 11
4.4 MULTIPRICE	pag. 12
Schedule 4.4 Function of pins of multiprice coin selector	pag. 12
5 OPTIONS	pag. 12
5.1 AUTOPROGRAMMABLES	pag. 13
Schedule 5.1 Description of programming by DiP-switch	pag. 13
Schedule 5.2 Determination of credit value wit DIP-switch	pag. 14
5.2 SEPARATORS	pag. 14

1 INTRODUCTION

The **AL05** electronic coin selectors' series belong of a new generation of coins and/or tokens validators, successor of the **AL03** series with which is fully compatible both at mechanic and electronic level.

This coin selector is compatible with the most of coin selectors of 3 ½" type, they use 10 poles IDC connectors and gives the possibility to invert the polarity by a simple connection on the electronic card.

The improvements introduced in this new generation are:

- system of optimal measurement thanks to a suitable placement of the sensors and to the introduction of optical sensors that prevent the possibility of fraud: *jojo fraud, coin wrapper, time stop, tear wire, false coins, iron stick, anti piezo*.
- consumption absolutely lower than the one of the AL03 series;
- feeding with tensions from 10VDC to 24VDC without any adaptor;
- microcontroller FLASH type that gives the possibility at the user to make modifications and updating on the program.

FEATURES	AL05	AL03
Number of channels	12	12
Velocita' di accettazione	3 (4) ¹ coin/sec	3 (4) ² coin/sec
Diameter acceptable coins	15 – 25 (32) ² mm	15 – 25 (32) ³ mm
Thickness acceptable coins	0,8 – 2,5 (3,5) ³ mm	0,8 – 2,5 (3,5) ³ mm
Feeding	8 – 26 V DC ³	10 – 16 V DC
Consumption in rest	25 mA	35 ⁴ mA
Consumption acceptance in	350 mA (20ms)/50 mA (hold) ⁵	350 mA ⁵
Communication	Serial, Parallel, RS232	Serial, Parallel, RS232
Connection	10 poles IDC (outputs ser. and par.) 4 ways RS232	10 poles IDC (outputs ser. and par.) 4 ways RS232
Outputs	50 V, 500mA "open collector"	50 V, 500mA "open collector"
Inputs	"activ H" 2,5 V – 30 V DC	"activ H" 2,5 V – 30 V DC
Dimensions	102 x 89 x 53 mm	102 x 89 x 53 mm
Weight	195 g	240 g
Work temperature	0 °C do 70 °C	0 °C do 70 °C

Schedule 1.1 Comparison between the AL05 and AL03 coin selectors' series

Assemble the coin selector from 90 to 95 grade from the ground. Cause the sophisticated control fraud system used on this product, it is necessary that the coin won't be obstructed till its total ejection from the coin selector. The company declines every responsibility about the bad work caused from the not observation of these specifications.

¹ The models K and KS type have the possibility of acceptance of 4 coins/sec.

² It is necessary to remove the small plastic piece on the collapsible plate

³ The consumption and the features remain the same

⁴ At a tension of 12 VDC

⁵ It is not dependent from the input tension

2 MECHANICAL VERSIONS

The mechanical versions are:

1. V model
- 2a. K model
- 2b. KS model

2.1 V Model

This model is compatible with the mechanic⁶ coin selectors from 3 ½".
The entry of the coins is in the high side, while the output of the accepted coins and that one of the refused coins are in the low side of the coin selector (see *ph. 2.1*).

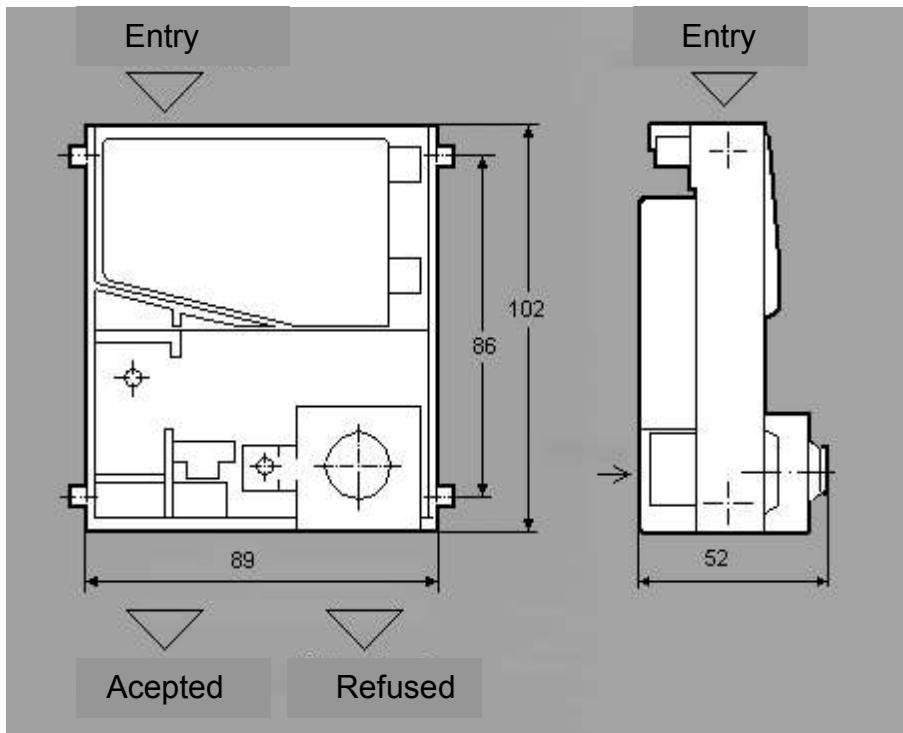


photo. 2.1 V Model

⁶ Also called "English coin selector"

2.2 K Model

This model is usually used on the machines of recent production.

Features:

- simple to assemble;
- it needs a smaller space for the assembly;
- the output placement of the accepted coins makes the coin selector more speedy (*up to 4 coins each second*).

The input of the coins is in the high side of the coin selector.

The output of the accepted coins is in the low side, while that one of the refused coins is frontal (*see ph. 2.2*).

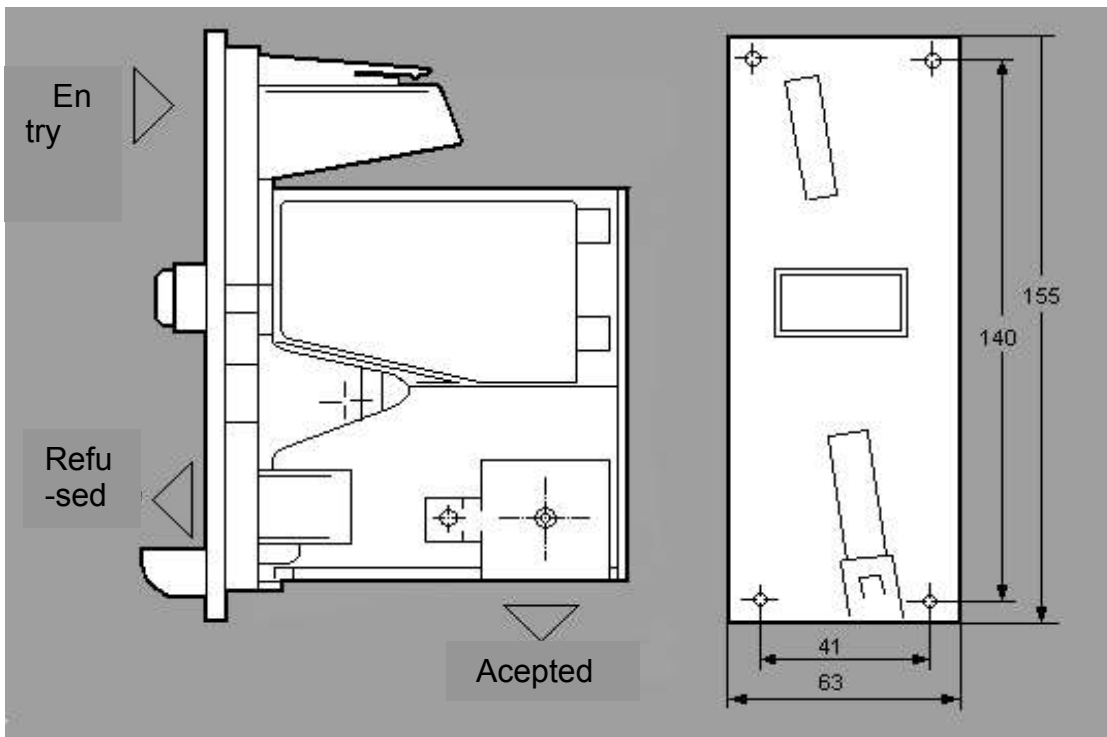


photo. 2.2 K Model with front plate

2.3 S Model

This model is similar to the K model, except for the input of coins (side entrance), that is lateral and for the reduced dimensions of the front plate (60x120).

This latter feature gives a bigger flexibility of assembly of the coin selector on the equipments where the space is limited

(see *ph. 2.3*).

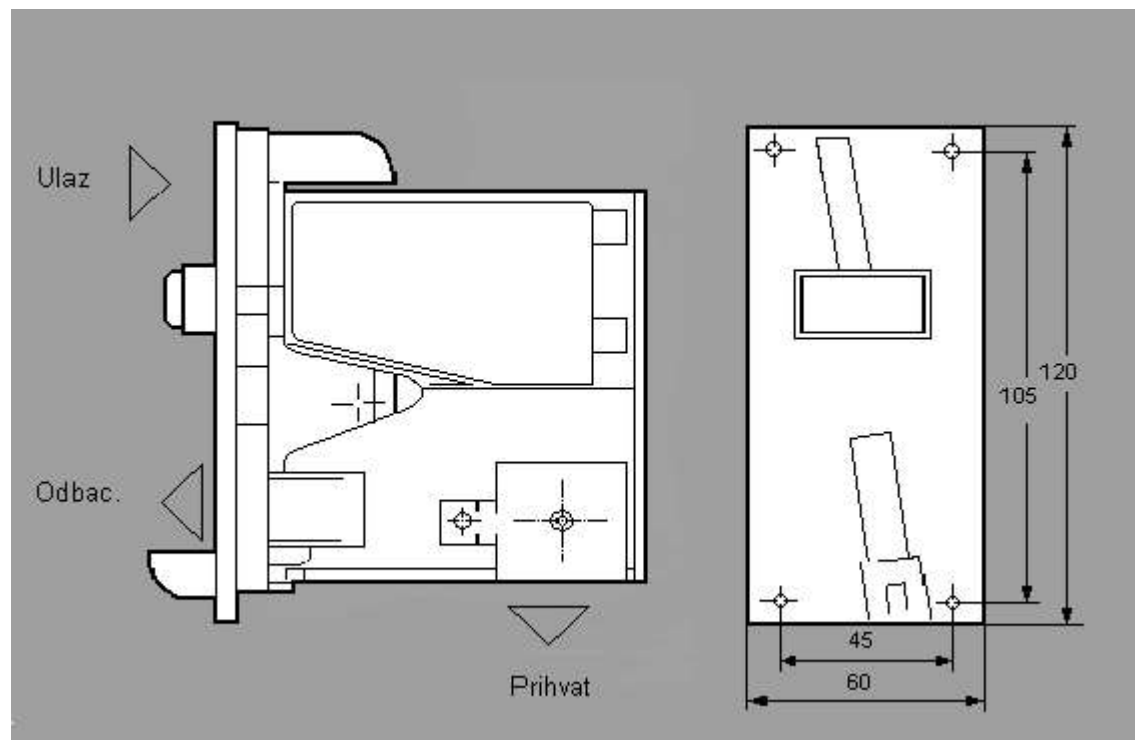


photo. 2.3 S Model with front plate

3 CONNECTIONS

The coin selector can be connected at the peripheral by two connectors (10 poles, 4 poles) as shown in the ph. 3.1

The feeding takes place by the 10 poles IDC connector (X1), represented with a scheme in the ph. 3.2.

The connector is composed from 6 outputs "open collector" type (*pin 3,4,7,8 ,9,10*), an active input at high level (*pin 6*), while the pin 5 has a double function and can be used both as input and "open collector" (output).

At demand is possible to modify the positions of the R63 - R64 resistences (see ph. 3.1) and to invert the polarity of feeding (*pin 1 i 2*) .

The RS232 serial communication takes place by a 4 poles connector (X3) and an **AL032** adaptor.

The communication protocol includes the "master/slave" modality, available on the web site www.alberici.net.

The connection scheme of the X3 connector is represented in the ph. 3.2.

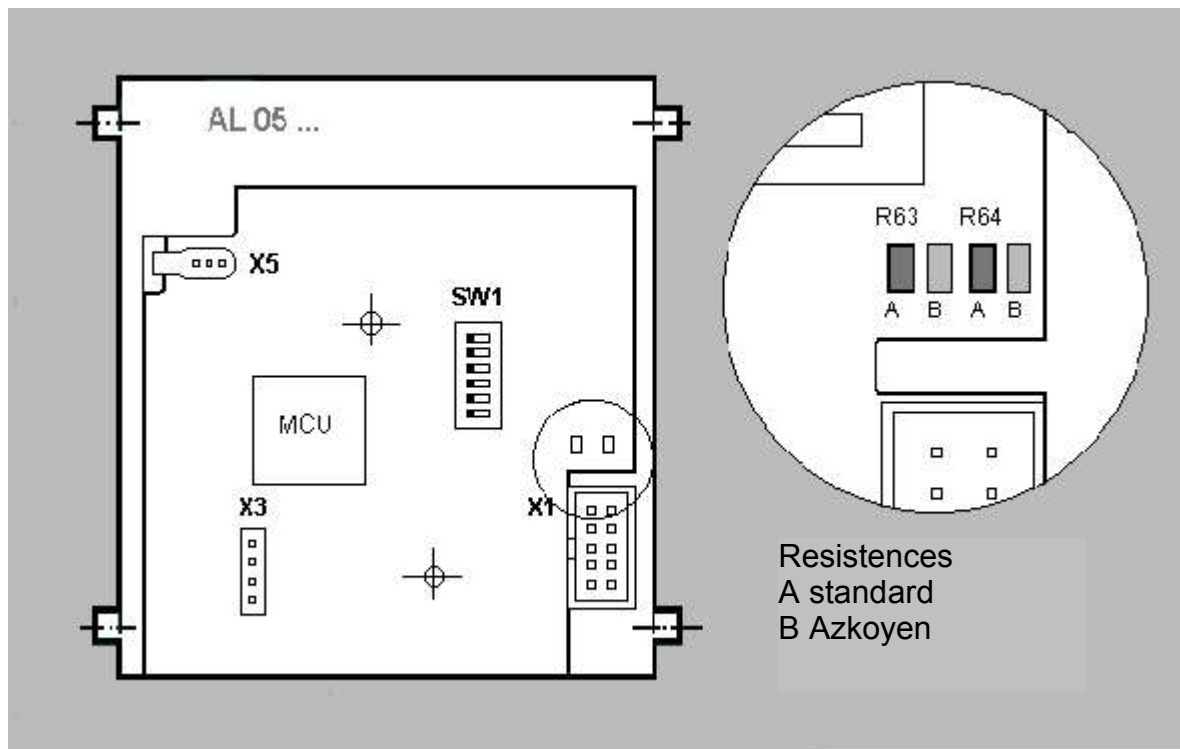


photo. 3.1 Placement of connectors, DIP-switch and inversion of polarity

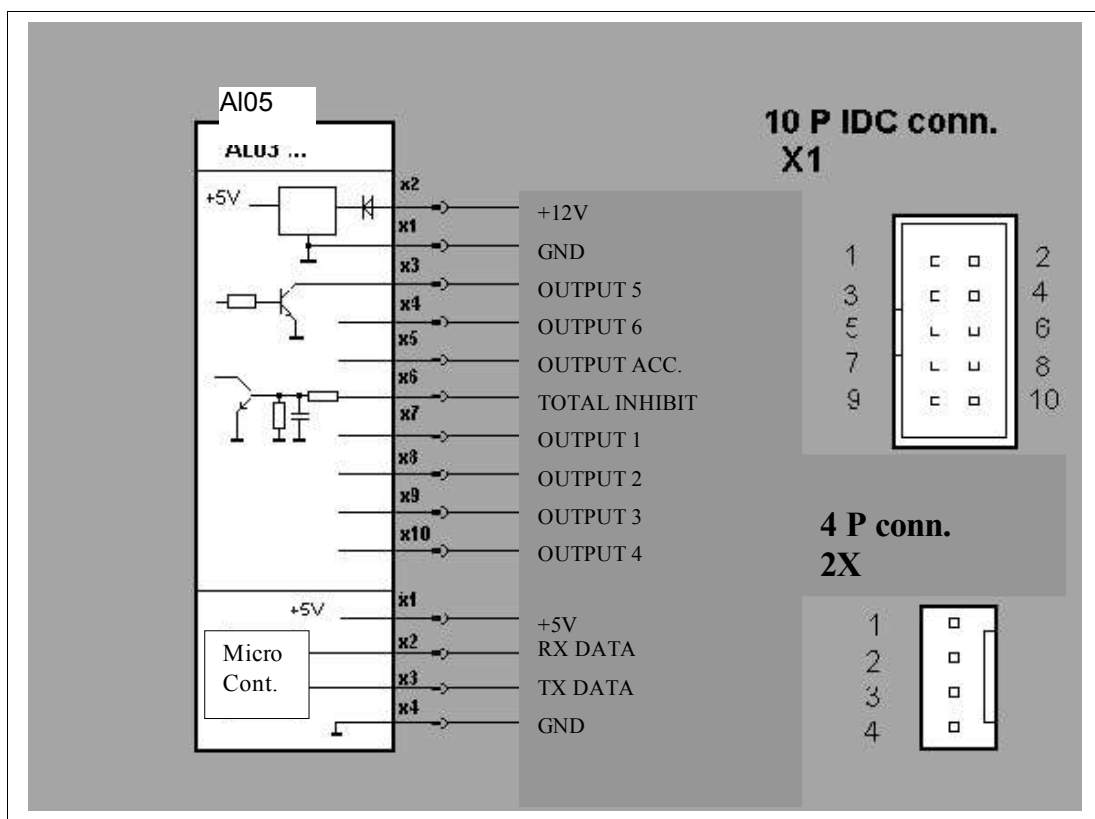


photo. 3.2 Scheme of AL05 connection

4 FUNCTIONAL VERSIONS

There are different types of functions and/or versions that the user can formulate with complete autonomy, by the simple use of a support program (*programmer*), a PC (*Win9x, 2000 ili NT4*) or a "palm" PC with Windows-CE installed.

The available versions (correspondent with the connection standard⁷) are:

1. Validators
2. Totalizators
3. Timers
4. Multiprice

All the AL05 electronic coin selectors' series, in addition to the standard connection by the 10 poles connector, have the possibility to transmit some data in the so-called "master mode"⁸, by a RS232 interface.

The communication protocol is at disposition of the user on the web site (www.alberici.net).

⁷ Is implicit a standard of connection of data transmission and of cable lay up

⁸ Master mod means the transmission of data from the coin selector at the end of some function as for ex. the passage of an accepted or refused coin.

4.1 VALIDATORS

This group is referred to electronic coin selectors with six outputs in parallel.

At each output can be associated one (or more) of the twelve available channels, and it can works in the modality *single or multi impulse*.

This latter possibility has lately found a vaste usage in the vending machines that need a continuous updating, in particular after the introduction of the new **euro**⁹ coin.

There are also validators at 3 and/or 4 outputs with the pilotage of the separators bobbins at 3¹⁰ and/or 4 ways.

They are also available in the autoprogrammable version with the possibility of the programming of 6 channels by DIP-switch (*see description in the 5 OPZIONI chapter*).

The formulation fo the duration time of the active signal as the programming of channels has made by programmer.

The deshabilitation of the single output or channel can be made by DIP-switch directly on the coin selector or by programmer.

Bringing a tension from 3 VDC to 30 VDC on pin 6 (or 5, *if it has been chosen*) the acceptance of all coins (**Inhibit**) is stopped (inhibited).

The standard placement of pins in the 3 techniques of work is shown in the schedule here below.

	pin 1	pin 2	pin 3	pin 4	pin 5	pin 6	pin 7	Pin 8	pin 9	pin 10
standard and multi imp.	GND	+Vs ¹¹	output 5	output 6	-----	block	output 1	output 2	output 3	output 4
Combinat	GND	+Vs ¹²	bit 3 MSB	Parity	-----	block	mod ¹²	Bit 0 LSB	Bit 1	bit 2
Separator	GND	+Vs ¹²	bobin. separ. B	bobin. separ. A	-----	block	output 1	output 2	output 3	output 4 ¹³

Schedule 4.1 Function of validator pins

⁹ All records is available on the web site: <http://www.alberici.net>

¹⁰SA3 Alberici Separators

¹¹ Tension from 10 to 26 VDC

¹² Way selection: active = combinatory, deactive = standard

¹³ Non viene usato con il separatore SA3

4.2 TOTALIZATORS

The totalizators are also called **coin selectors with emission of serial impulses**.

The main feature of the totalizators is that, each time the introduction of a coin allows to reach the formulated value in the accumulator, at the output you have a series of impulses of the programmed duration.

The transmission protocol of the serial impulses, proportionals at the acquired values, is called **Executive Protocol**.

The duration of the active impulse can be regulate from 5 to 1000 ms with feed from 5 ms.

The value of each channel (*coin value*) vary from 1 to 100.

The **AL05** totalizators have the introduction of two bonus levels (additional impulses) programmables.

Besides the basis version, is possible to program the coin selector in the underversion **at emission of impulses at demand**, or to activate the separator option.

In the autoprogrammable version the DIP-switch can be used to define the price of a credit or for the deshabilitation of the single outputs.

For the inhibition of the coin selector, you have to bring an high tension on the **Inhibit** input (*pin 5 or 6*).

The activation of the output impulse in the version at demand can be made bringing a tension on pin 5 or 6 (*programmable*).

The inputs can have also combinatory functions, this means that, until when is present a tension on the input, the acceptance of coin results deshabilitated, as soon as you take away such tension, the output impulse is activated.

In addition it is possible to use an output as meter and another one to inform about the relative rests of credit.

The user is free to use any output pin (see *ph. 3.3*) for the activation of credits or for other functions.

The standard placement of the functions of pins is represented in the schedule 4.2

	pin 1	pin 2	pin 3	pin 4	pin 5	pin 6	pin 7	pin 8	Pin 9	Pin 10
Standard ALBERICI	GND	+V _s ¹²	-----	-----	output credit	input block	-----	-----	-----	-----
at demand ALBERICI	GND	+V _s ¹²	-----	-----	output credit	input block/ at dem.	-----	-----	-----	-----

Schedule 4.2 Function of totalizator pins

4.3 TIMERS

The coin selectors that give in output a temporised impulse whose duration is proportional at the acquired value, are called **Timers**.

There are two timers' versions:

- **Proportional timer;**
- **Timer at demand.**

In the proportional version, when the accumulated value reaches a credit value, the output is activate for a specific period of time.

Adding coins in a proportional way the time of activation is increased.

In the version at demand, on the contrary, the activation of the output takes place bringing an high tension on one of the input pins (pin 5 or 6), only if the accumulated value reaches the value of a credit.

The period of duration of the impulse is always the same and, if at the end there are still credits not realized, bringing once again a tension at the input the next impulse is activated, or is extended the present one if the input is activated before the ending of time.

As in the totalizator version, also in this case are possible the following options: autoprogrammable or with separator.

The placement of the functions of pins in the timers is represented in the schedule 4.3

	pin 1	pin 2	pin 3	pin 4	pin 5	pin 6	pin 7	pin 8	pin 9	pin 10
timer proport. ALBERICI	GND	+V _s ¹²	-----	-----	timer output	input block	-----	-----	-----	-----
timer proport.	GND	+V _s ¹²	-----	-----	-----	input block/ stop	-----	meter output	timer output	output time out
timer at demand ALBERICI	GND	+V _s ¹²	-----	-----	timer output	input block/ dem.	-----	-----	-----	-----
timer at demand	GND	+V _s ¹²	-----	-----	-----	input block/ dem.	-----	meter output	timer output	output rest

Schedule 4.3 Function of pins of the coin selectors with timer

4.4 MULTIPRICE

This version is used mainly in the vending machines.

The feature of this version is that the outputs are activated and stay in this state until when the accumulated value arrives at the formulated value (*price*).

Each output can be formulated with different price.

Reaching the determined price, is activated the output at them programmed.

There are different ways of functionality of the outputs, and they can be formulated only in factory.

The first way is that the line of the lower price is deactivated when the formulated value reaches the value of the next price (higher) programmed.

The second way is that all the lines with the reached price stay active.

The third way is the survey system (*scanner*), where there is the possibility to identify which of the sales lines was active.

The first two ways, after that the sale is made, always take away the value of the maximum active line of sale.

Since it has been reached the maximum price, the coin selector does not accept anymore coins!

After that the sale is made, the equipment (vending machine) send at the input a **reset** impulse with which cancels the value of the price of the active output (deducted from that one accumulated), and this value, if the accumulated value remaining should not be enough, is deactivated.

As in the versions of totalizator and timer at demand, the rest of the credit can be indicated by pins (correspondent with the used number).

There is the possibility to keep or to cancel the rest (immediately or after a certain period), this latter is lower than the minimum price (adjustable).

In addition of the listed versions, there is also the version for **photocopiers**.

This version uses only an output to make the sale, and cancels itself (goes to zero) when the coin selector receive a specific number of impulses (adjustables).

The standard placement of the pins functions of the multiprice coin selectors is represented in the schedule here below.

	pin 1	pin 2	pin 3	pin 4	pin 5	pin 6	pin 7	pin 8	pin 9	pin 10
multi price	GND	+V _s ¹²	Pz. 5	Pz. 6	reset	block	Pz. 1	Pz. 2	Pz. 3	Pz. 4
two prices	GND	+V _s ¹²	-----	-----	reset	block	-----	Pz. 1	Pz. 2	output rest
photocop	GND	+V _s ¹²	-----	-----	dem. of emiss	block/ reset	-----	coin meter	sale output	output rest

Schedule 4.4 Placement of pins for the multiprice versions

5 OPTIONS

The standard versions of working, described in the previous chapters, can be completed with the following options :

- 1 Autoprogrammable;
- 2 Separator.

5.1 AUTOPROGRAMMABLE

This option regards all the AL05 electronic coin selector' versions, that is to say, any kind of coin selector can be sold as autoprogrammable.

The feature of this type of coin selectors is that the programming of coins and/or tokens is made by DIP-switch and without the help of the programmer.

Besides the coins, by the DIP-switches it is possible to program also other features in relation to the type of coin selector¹⁴.

You can make the programming as follows:

- put all the DIP-switches in position **off** (*switched off*), in this way the coin selector goes in the programming modality;
- switch on the feeding;
- put in **on** the DIP-switch corresponding at the output of the channel to program;
- insert the 10 coins or tokens to program and be sure that, at the end of the insertion, the bobbin of the coin selector makes a *double click*, as confirmation of the programming. At specific demand it is possible to increase or reduce the number of samples to use;
- at the end of programming put the DIP-switch of the programmed channel in position **off**;
- repeat the operation for each single channel.

If the bobbin of the coin selector, at the end of the programming, makes a single click it is necessary to repeat the operation (usually the reason is that there are some DIP-switches open at the same time).

At the end of the programming it is necessary to switch off the feeding, to formulate the DIP-switches and switch on once again.

DIP SW1	1	2	3	4	5	6
BIN VALUE	1	2	4	8	16	32
PROGRAMM.	OFF	OFF	OFF	OFF	OFF	OFF
CHANNEL 1	ON	OFF	OFF	OFF	OFF	OFF
CHANNEL 2	OFF	ON	OFF	OFF	OFF	OFF
CHANNEL 3	OFF	OFF	ON	OFF	OFF	OFF
CHANNEL 4	OFF	OFF	OFF	ON	OFF	OFF
CHANNEL 5	OFF	OFF	OFF	OFF	ON	OFF
CHANNEL 6	OFF	OFF	OFF	OFF	OFF	ON

Schedule 5.1 Description of programming of coins by the DIP-switch

¹⁴ See description for each single type

In the autoprogrammable versions with totalizator the output impulse for the credit is formulated as standard on pin 9¹⁵ or 5¹⁶.

During the phase of work, the DIP-switch is used to determine the credits' value, formulating some binary combinations as in the schedule 5.2¹⁷, or for the deshabilitation of the outputs (in this case the value of credits is formulated in factory).

DIP SW1	1	2	3	4	5	6
BIN VALUE	1	2	4	8	16	32

Schedule 5.2 Indication of the credit values by DIP-switch

The **autoprogrammable with timer** version is programmable as the totalizator, and in phase of work uses the DIP-switch to determine the minimum value of credit (schedule 5.2).

Each single channel has already formulated a fixed value at the moment of the order or modified after by programmer.

The standard values of the channels are represented in the schedule 5.3.

5.2 SEPARATOR

This option too regards all the AL05 electronic coin selectors' versions.

This modality provides for the reduction of the outputs number since two of them are used for the pilotage of the separator' bobbins.

Usually are used pin 3 (*bobbin A*) and pin 4 (*bobbin B*).

At demand or by programmer, it is possible to formulate also different pins.

The activation of the separator' bobbins is synchronized with the arrival of the coin at the output of the coin selector.

In this way the "rock-burst" is reduced in the phase of the coin acceptance and separator activation.

The time of stoppage of the separator bobbin is of 100 msec (*typical*), but at demand it can be programmed as per any requirements.

All descriptions and drawings in this manual are not binding : ALBERICI S.p.a. reserves the right to carry out any necessary modifications.

¹⁵ Compatible with SECI RM4

¹⁶ Compatible with AL03 ALBERICI

¹⁷ At each open switch is added the binary value from the schedule