5. Exit module PCB
Houses the microprocessor with flash memory.

6. Coin entry rocker
This element is designed to stabilise the speed at which the coins move through the interior of the *validator*.

7. Acoustic sensor
This device receives the sound made by the coin when it hits the *metallic cylinder* on falling into the validator. The parameters received by this sensor are very important in the coin acceptance or rejection process.

8. Metallic cylinder
This is a complement to the acoustic sensor.

9. Inductive sensors
3 pairs of inductive sensors for the "turbo" version and 1 pair of sensors for the "normal" version, which obtain parameters related to the alloys and thickness of the coin.

10. Infrared sensors
3 pairs of infrared sensors that obtain parameters related to the diameter of the coin.

11. Acceptance gate
When the *validator* validates a coin, the electromagnet opens the gate to let the coin through the accepted coin channel.

12. String detector
An electro-mechanical system to foil any attempt at fraud using a string tied to the coin. The system is based on an infrared beam passing through a hole in the *shutter*. The beam is interrupted when the string attached to the coin tenses and moves the *shutter*. The *validator* interprets this signal as a fraud attempt and inhibits the coin.

13. Sensor module
This element houses the majority of the measuring and control systems the *validator* has. It is common in all the models that have the same sensorisation systems, and where all the different measurements and controls are carried out to determine if the coin is accepted or rejected.

1.4. FUNCTION

1.4.1. A-standard *Validator* in Parallel mode

The ***validator*** **working in Parallel mode gives a signal to identify the coin through one or more lines when a coin is accepted.**

- These *validators* have 7 lines that can be:

- **dedicated:** which means that only 7 different coins can be validated as one line is used to identify each coin.
- **binary:** which means various lines can be used to identify a coin, with a maximum of 32 different coins.

As all the lines in these *validators* are configurable, the 7 lines can be used to identify coins or other tasks; for example for coin return

- The **duration of the pulses** is configurable data. They can be later modified by reprogramming using the TL20 programmer.
- The **exit assignation** is configurable data. They can be later modified by reprogramming using the TL20 programmer.
- Working in this mode, when a coin is validated one pulse of a determined duration is given through an assigned line. An Azkoyen sorter can be controlled using pins 3, 4 and 5. This implies the use of a different exit module PCB.

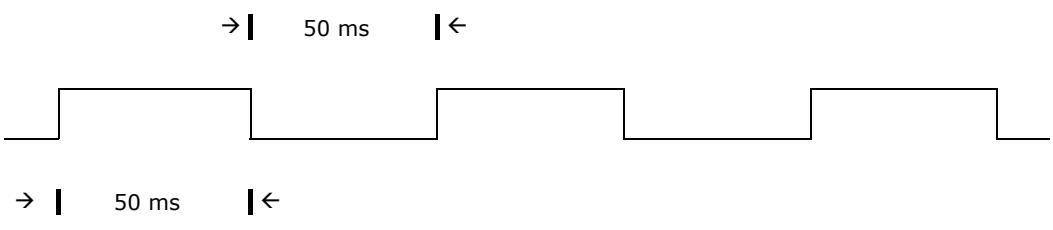
1.4.2. A-standard *Validator* in Timing mode

The ***validator*** **working in Timing mode gives time when the programmed price is reached.**

This *validator* offers three working modes:

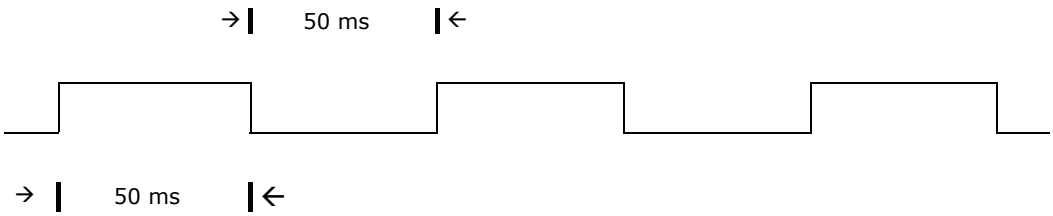
- **Work for a continued time.**
  On accepting the coin, the time signal is **automatically** given **all at once**, without varying the state of the pin until it is finished. The pin is configurable.

  Pin 6 works as inhibition in accepting the coin. The inhibition is configurable.
- **Work for a continued time with Service Request.**
  On accepting the coin, the time signal is given all at once when the user requests it through pin 6. For this to happen it is necessary for pin 6 to change state, that is form active (0 or 1, depending on the configuration) to inactive for a minimum of 50 milliseconds. It is necessary fir the pin to return to inactive state for a minimum of 50 milliseconds to be able to sell the following signal.



- **Work for Service Request.**

  Through pin 6 the time signals are requested **one** by **one**. For this to happen it is necessary for pin 6 to change state, that is form active (0 or 1, depending on the configuration) to inactive for a minimum of 50 milliseconds. It is necessary fir the pin to return to inactive state for a minimum of 50 milliseconds to be able to sell the following signal.



In the three working modes a **counter** signal is produced, which is variable and configurable, as much in the time ON as in the time OFF. It is used to count, usually in an electro-mechanical counter, the base coin that is introduced into the machine. For example, if the base coin is €1, when two 50-cent coins (1€) are introduced, a counter pulse is produced, or when five 20-cent coins (1€) are introduced, it also produces a counter pulse. The pulse on this line is configurable

In the three working modes a **credit available** signal is produced. It is usually used for a credit lamp to inform the user that there is a credit. The signal on this line is configurable.

In the three working modes a **warning** signal can be activated to advise of an imminent end to the service when a certain time is left, time also configurable. The signal on this line is configurable.

> The **counter**, **credit available** and **warning** signals are all configurable: they may, or may not, be in the final configuration of the *validator*

1.4.3. A-standard *Validator* in Credit mode

The ***validator*** **working in Credits mode gives a credit signal when the price programmed is reached. This signal has a configurable length for "1" and "0". The pin is also configurable.**

These *validators* offer two working modes:

- **Working with continuous pulses.**
  It accepts the coin and **automatically**, gives the credit impulses consecutively until they are finished. The pulse on this is configurable.

Pin 6 works as inhibition in accepting the coin. The inhibition is configurable.

- **Working with Service Request.**
  Through pin 6, the pulses are requested **one** by **one**. For this to happen pin 6 must go from inactive to active for a minimum of 50 milliseconds. Then it must go back to inactive for a minimum of 50 milliseconds to be able to sell the following signal.

In both working modes, a **counter** pulse is produced, which is variable and configurable, as much in the time ON as in the time OFF. It is used to count, usually in an electro-mechanical counter, the base coin that is introduced into the machine. For example, if the base coin is €1, when two 50-cent coins (1€) are introduced, a counter pulse is produced, or when five 20-cent coins (1€) are introduced, it also produces a counter pulse. The pulse on this line is configurable.

In both working modes, a **credit available** signal is produced. It is usually used for a credit lamp to inform the user that there is a credit. The line for this signal is configurable.

The **counter** and **credit available** pulses are both configurable: they may, or may not, be in the final configuration of the *validator*

A **warning** pulse does not exist in either of the working modes

1.4.7. *Validator* programming method

The following lines indicate the possible working parameters of the *validator* that can be modified using a TL21, or similar, and the *validator* dipswitches.

1.4.7.1. Dipswitches

They have a dual use:

- Select the **working mode**.
- Programme determined **parameters.**

Position of the dipswitches for SELECTING THE WORKING MODE					
WORKING MODES	SW4	SW3	SW2	SW1	Validator A-standard
	0	0	0	0	Parallel
	0	0	1	1	Not used
	0	1	0	0	Not used
	0	0	0	1	Timer
	0	0	1	0	Credits

Position of the dipswitches to SELECT THE PARAMETER TO MODIFY				
PROGRAMMING PARAMETERS	SW3	SW2	SW1	Validator A-standard
	0	0	0	Price of service
	0	0	1	Coins to accept
	0	1	0	Time of the service
	0	1	1	Token 1
	1	0	0	Token 2
	1	0	1	Wide Tables
	1	1	0	Bonuses
	1	1	1	Free

To programme the parameters with the *dipswitches,* follow these steps:

1. Set the dipswitches SW3, SW2 and SW1 to the configuration of the parameter to modify.
2. Set dipswitch SW4 to ON. The electro-magnet of the acceptance gate will give a "short click".
3. Follow the actions to programme the parameter (1.4.7.2)
4. Set dipswitch SW4 to OFF. If the programming has been done correctly, the acceptance gate will give a "long "click". If it has been done incorrectly, there will be no click and you should repeat the steps from the beginning.

1.4.7.2. Actions to carry out for correct programming

- **Service Price**: introduce the quantity of coins that are necessary to reach the price. The programmed price will be the sum of the value of coins introduced. If the validator rejects the coin, it will not be included in the programming.
- **Coins to accept**: the coins to be accepted are chosen from those programmed in the *validator*. The rest will be inhibited and not be accepted.
- **Service Time**: introduce the quantity of coins that are needed to reach the required time depending on the value, in time, of each coin. The value in time of each coin must be specified.

Maximum value programmable 65,535 seconds.

If the maximum value is exceeded while programming, this value will not be accepted and it will not be programmed.

If a coin is rejected during programming, its value will not be considered.

- **Token 1 / Token 2**

1. Set the dipswitches to programme token 1 or token 2.
2. Set dipswitch SW4 to ON. The electro-magnet will give a "short click".
3. Introduce at least 25 tokens of the model you wish to programme into the *validator.*
4. Set dipswitch SW4 to OFF. The electro-magnet will give a "long click".

To programme the second type of token the process must be repeated.

The value of the tokens is fixed (the value set in the factory when the validator was programmed) and can only be modified using the TL20 terminal, or similar.

- **Activate / Deactivate Wide Tables and Bonuses.**

The process to **activate** wide Tables/Bonuses is the following:

1. Set dipswitches SW3, SW2, SW1 to the correct positions.
2. Set dipswitch SW4 to ON. The electro-magnet will give a "short click".
3. To activate Bonuses introduce a coin that should be accepted. If the *validator* rejects it, introduce another coin.
4. Set SW4 to OFF. The electro-magnet will give a "long click".

The process to **deactivate** wide Tables/Bonuses is the following:

1. Set dipswitches SW3, SW2, SW1 to the correct positions.
2. Set dipswitch SW4 to ON. The electro-magnet will give a "short click".
3. Set SW4 to OFF. The electro-magnet will give a "long click".

1.4.7.3. TL20 Programmer

The TL20 programmer, or similar, is connected to the *validator* with a 4-way connector located in the sensor *module*. The parameters can be modified and user configurations that suit the destination of the *validator* can be created with this programmer.

The TL20 programmer, or similar, can programme a unique configuration for each type of A *validator* (Standard or Totaliser); the parameters that are set with the dipswitches should be