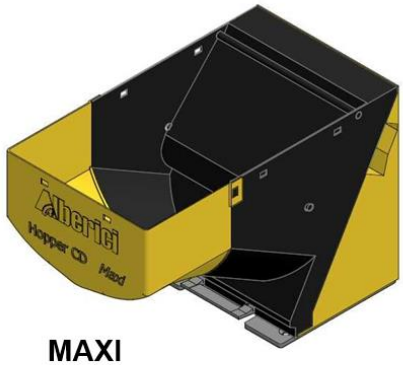
# Hopper CD Pulse

Operator's manual

Rev. 1.03

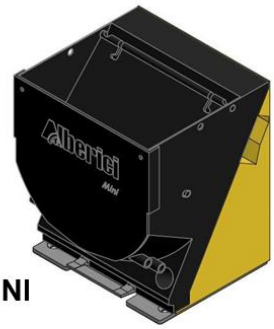
# Hopper CD Pulse

## Mini, Midi, Maxi, Lateral

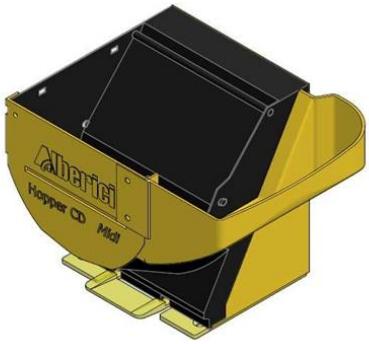



MAXI

MIDI




MINI




LATERAL

## Technical Manual

Alberici

Progettazione e produzione di sistemi di pagamento, accessori per videogames e macchine vending

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# *1. General description*

Congratulations for having purchased our **HopperCD!** This HopperCD has been designed and realized in the **Alberici's research laboratories** and satisfies all the requirements of the coin- op market. It makes use of the most modern electronic and mechanical technologies.

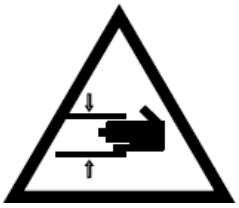
## 1.1 Range of use

The technology implemented makes the **HopperCD** able to manage different operations, i.e. to count up and control the type of coins paid out, and to stop automatically when empty.
To this purpose it makes use of a significant quantity of control routines for the management of the internal and external events.
It builds-in easily both into **Slot / AWP machines** and into **money changer machines**. Its features make it easily compatible with all the cards normally available on the market.

## 1.2 Safety

***The Hopper unit must be installed into systems endowed with ON-OFF mains switch.***

The HopperCD must be connected to and disconnected from its slide connector only when power supply is off. The device includes mechanical parts in motion: DO NOT put your fingers inside it during operation. The installation must be carried out as specified in paragraph 2.3.
Guarantee shall not apply if such instructions are not complied with.



**CAUTION: HARM DANGER!**

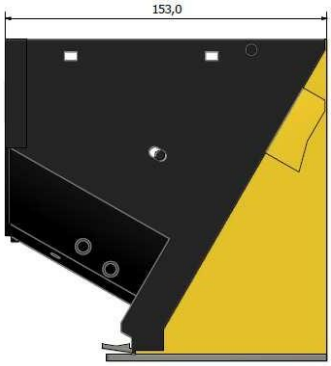
MECHANICAL PARTS IN MOTION

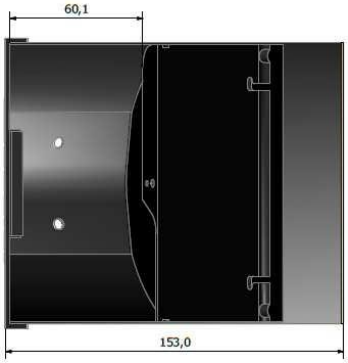
## 1.3 Technical specs

| | |
|---|---|
| Peso Weight | 0,595 Kg (Mini) – 0,660 Kg (Midi)<br>0,695 Kg (Maxi, Lateral) |
| Alimentazione Operating voltage | 24 Vdc |
| Assorbimento Current draw | 800 mA |
| Temperatura di lavoro Operating temperature | 0°C ÷ 50°C |
| Umidità Humidity | 20% ÷ 75% |
| Protocollo Interface | Aes 256 D.H. - Aes 2048 D.H. - ccTalk - Pulse |
| Capienza Capacity | 325 (Mini) – 500 (Midi) – 725 (Maxi) – 775 (Lateral) |
| Velocità Speed | 280 monete/min coins/min (7 fori holes) – 240 monete/min coins/min (6 fori holes) - 200 monete/min coins/min (5 fori holes) |
| Diametro monete Coins diameter | 18÷ 26,5 mm (disco a 7/5 fori – 7/5 holes disk)<br>22÷ 31,5 mm (disco a 6 fori – 6 holes disk) |
| Spessore monete Coins thickness | 1,8 ÷ 2,6 mm (dischi 7/6/5 fori – 7/6/5 holes disk) |

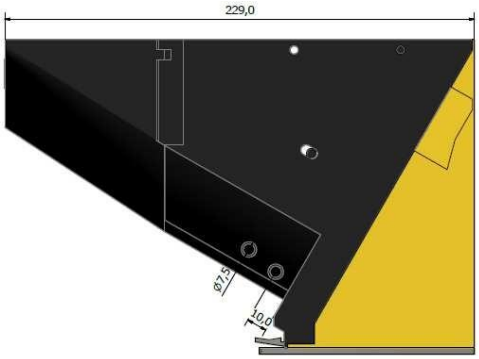
# 2. Mechanical description

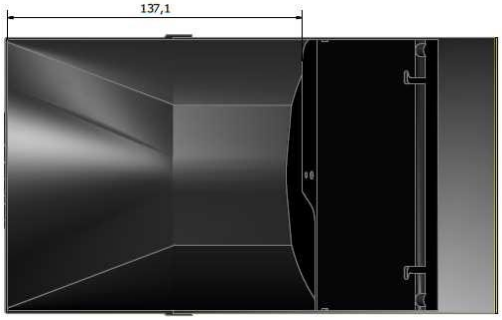
The HopperCD is available in 4 different models, according to capacity and size. The standard features of the HopperCD make it interchangeable with similar devices already existing in the market. It can handle any coins whose diameter ranges between 20 mm and 26,5 mm. Coin thickness can range between 1,8 mm and 3,5 mm.



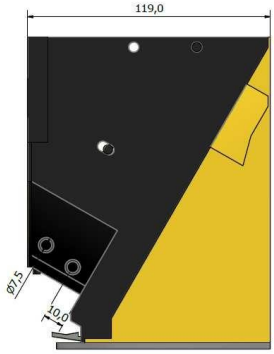



**MIDI**






**MAXI**



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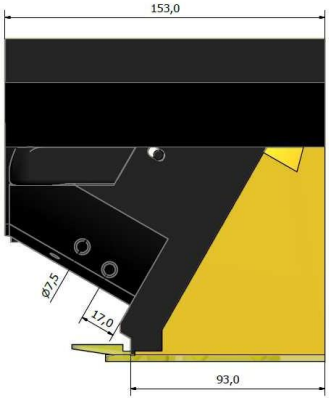
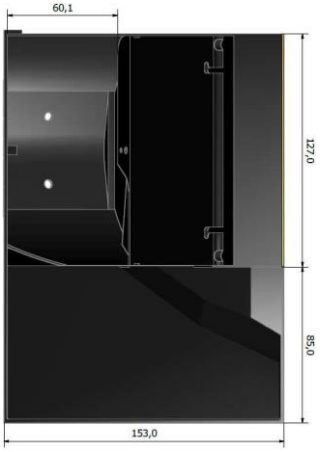


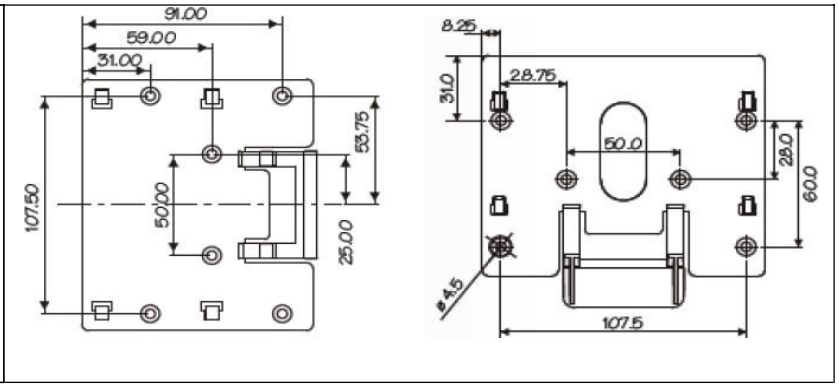



**LATERAL**

# 3. Installation

*Old sliding bases:*

. fasten the slide polycarbonate support
. fit the hopper into its seats and slide it in
. before plugging to power, please read chapter 4
To remove the hopper, hold the release clip pressed down, and slide the hopper out.



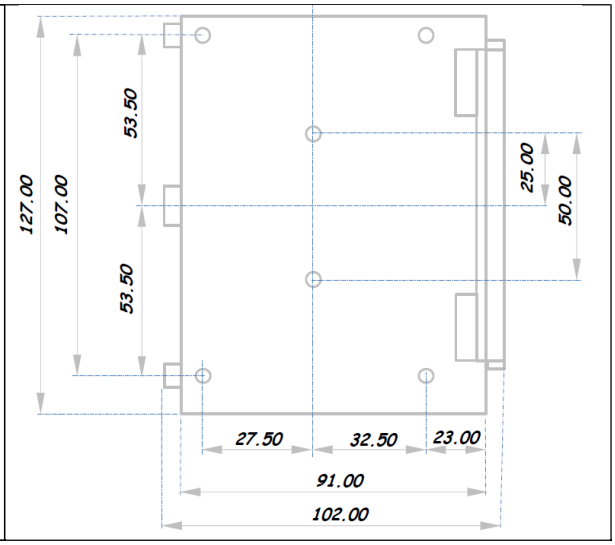

*Universal fixing bases:*

. fasten the slide polycarbonate support

. fit the hopper in position and push it down

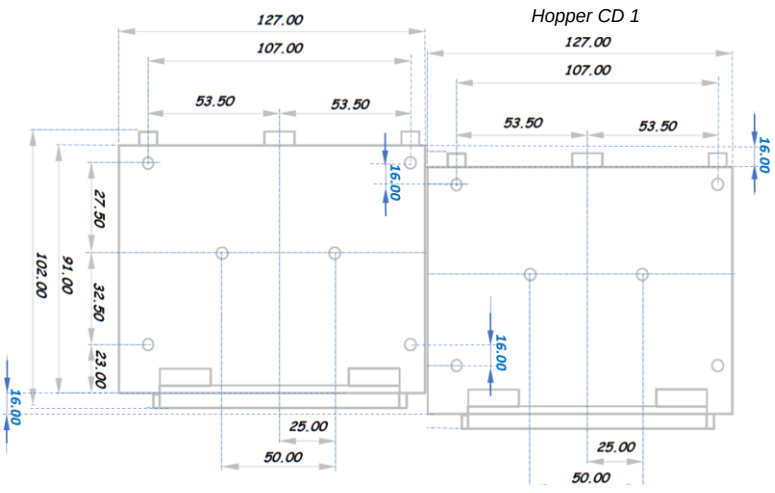
. before plugging to power, please read chapter 4

To remove the hopper, hold the release clip pressed outwards, and pull the hopper out.




*Hopper CD 2*

*Hopper CD 1*




*"Cascade" assembly*

To assemble two or more hoppers in cascade array, keep the hoppers scaled by 16mm.
First hopper in the line must stay 16mm behind the second, and so on.
The side image provides a view from the bottom (fixing base plates) of two hoppers.

# 4. Electrical specs

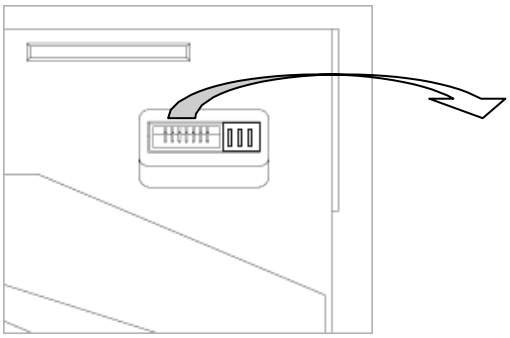
## 4.1 Power supply

| | | Standby | Empty | Loaded (*) |
|---|---|---|---|---|
| P.c.board | (+24 Vdc) | 40mA 0.48 W | 40mA 0.48 W | 40mA 0.48 W |
| Motor | (+24 Vdc) | 0mA 0m W | 70mA 1.68 W | 1 A * 24 W |
| Total Absorption | (Strength) | 0.48 W | 2.16 W | 24.48 W |

*(*) only temporarily if motor is blocked*
*The section of wiring must be chosen according to the given current draw specs.*

## 4.2 Connector PIN-OUT

A 10-pin standard connector is located behind the Hopper.



| 10 PIN PULSE | | | |
|---|---|---|---|
| ERROR | 1 | 2 | COIN |
| MAX | 3 | 4 | GND |
| MIN | 5 | 6 | VOID |
| +24 Vdc | 7 | 8 | GND motor |
| CONTROL | 9 | 10 | +24 Vdc |

When the hopper level controls are made through optic sensors, do connect the electrode plates to the machine ground terminals.

# *5. Control signals*

### 5.1 Input signals

IN3 = PIN 9 Input control LOW signal must be applied to start dispensing

### 5.2 Output signals

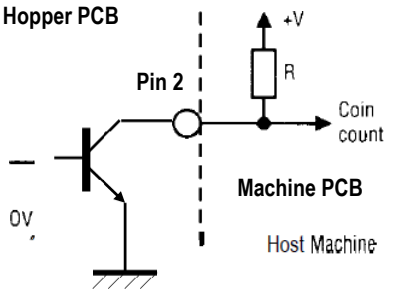
4 output signals are available:

| | |
|---|---|
| OUT1 (COIN) = PIN 2 | (See 5.2.1) |
| COINS HIGH LEVEL (LH = MAX) = PIN 3 | (See 5.2.2) - sensor not provided |
| COINS LOW LEVEL (LL = MIN) = PIN 5 | (See 5.2.2) |
| ERROR = PIN 1 | (See 5.2.2) |

#### *5.2.1 Signal OUT 1 (COIN) = PIN 2*

The function performed by this output is to communicate (by a low level signal) the dispensing of each coin to the machine main pcb (Host machine). The quantity of the pulses sent corresponds to the number of coins paid out by the hopper.
Apart from sending the return signal to the machine pcb, OUT 1 can be used to possibly connect a counter or a relay.

Such signals are open collector type. When the transistor is not in conduction, a pull up resistor (not included in the hopper, it must be provided by the OEM) will pull the output high (5 V or 12 V or 24 V).
The open collector provides for a simple interface to TTL and CMOS input devices.



### *5.2.2 Level signals*

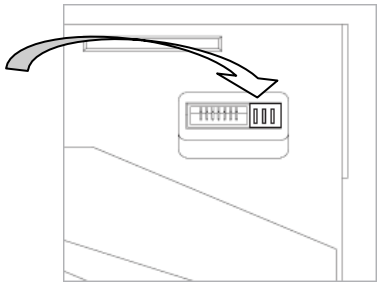
Low level signal (LL) on pin 5 (Minimum level / hopper in reserve): for all those systems where it is important to monitor the level of coins remaining in the hopper, a low level signal is transmitted as long as there are coins in the hopper, and a high level signal gets triggered as the hopper gets empty or in reserve.
The high level signal will be produced by a pull-up resistance (not included in the hopper, it must be provided by the OEM), while the low level signal is maintained by the presence of the coins. Their metallic body electrically conducts to GND in case of metal plate level sensors, or their mass cuts off the optic signal in case of optic sensor pairs.

High level signal (HL) on pin 3 (Maximum level / full hopper) will be available if sensor is provided by the OEM: in this case the high level signal corresponds to “coins in the hopper”, whilst the low level signal corresponds to “empty hopper”.

# *6. Operation*

It is necessary to choose in advance what type of operation suits your requirements best. This hopper can work by any of the three different modes, ***Mode 0, Mode 1,*** *or* ***Mode 2.***

## 6.1 Select the operating mode



Select the required mode by setting the Dip-Switches Row located beside the 10pin connector.
The logic state of these settings is detected at the start. The following table shows the possible combinations:

| | DS 1 | DS 2 | DS 3 |
|---|---|---|---|
| **Mode 0** | **OFF** | **OFF** | **OFF** |
| **Mode 1** | **ON** | **ON** | **OFF** |
| **Mode 2** | **OFF** | **ON** | **OFF** |
| **RESET** | **ON** | **OFF** | **OFF** |

## 6.2 Mode 0

By this operational mode the hopper distributes coins continually until power is stopped. The control of the hopper is exclusively made by powering the hopper motor by 24 Vdc through pin 10 and pin 8.

## 6.3 Mode 1

The 24 Vdc power must be supplied to pins 7 and 10; the start of the dispensed coins is made through pin 9 by a negative logic signal (low level). The dispensed amount must be monitored through pin 2, and when the quantity needed is reached, such logic signal must be turned to high. ***This is the mode most commonly used in the industry.***

### 6.4 Mode 2

In this case, the machine board will drive the hopper to dispense the coins. The hopper will pay out a coin for every pulse it receives on Pin 9.

An internal 16 bit register counts the pulses received into Pin 9. Then, the hopper dispenses as many coins as the received pulses.

The 16-bit register can count up to 65535 coins, more than any hopper can contain.

### 6.5 Reset

The reset simulates the switching-off, so it is not a functional condition but a command that can be activated at any time.

It allows to **restore correct operation, after an error occurred**.

After an error the device can be either reset or switched off and on again.

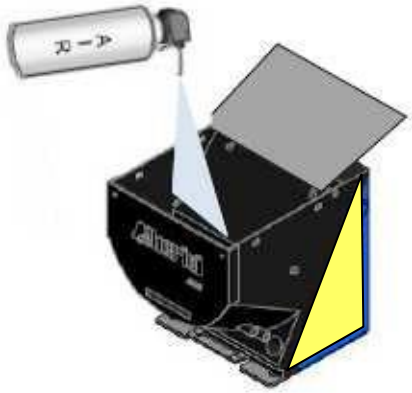
# *7. Maintenance*

Prior to any maintenance operation, switch power off and disconnect the power cord. Clean the disk of the Hopper every 100.000 pay-outs, by pressurized air.

The sloped shape of the optic sensor housing prevents the build-up of the dirt, so reducing the need to clean it too frequently. Whenever you clean the disc, it is anyway advised to clean also the output optic sensor.

Check from time to time that the reservoir and the disc do not contain debris or bent / warped coins, and always remove them, since they can obstruct the output or the rotation, hamper the operation of the hopper, damage the Hopper parts and thwart its performance.

To clean the Hopper, pull up its flap, and blow dry pressurized air onto the disc parts and the sensors slots (accessible through the coin pits), as well as through the coin outlet slot.



CAUTION: if any parts need to be dismounted for deeper cleansing or other maintenance operations, please send the Hopper to Alberici S.p.A., that will properly carry out the necessary service repairs, cleaning and updating.

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