ACS Pulse cashless reader for RFID keys

Operator's manual

Rev. 1.02

ACS

Pulse mode CASHLESS READER

for RFID Keys (MIFARE®)

User Manual

CE

Alberici® CASH SOLUTIONS

Progettazione e produzione di sistemi di pagamento e accessori per macchine Gaming, Vending e Car-Wash

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NOTICE

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Revisione n°	**Data**	**Modifica**	**Note**
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Rev. 1.01	26.04.13	Nuovo moduli Round e Square	
Rev. 1.02	22.07.15	Cambiato frontespizio	

Dear Sirs,

we would like to thank you and congratulate for your choice.

We trust that you will appreciate the quality and performance of the ACS Cashless Reader for RFID Keys.

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Please read carefully this handbook, to obtain the most from your machine

1. Package content

The Alberici Cashless System ACS is made up by:

1. As many read / write (RW) modules as requested
2. As many empty keys as requested

Notice: if you are not owning the Programming Kit K-P10-000005 ACS Reader , and the Programming interface K-P4N-000007 for ACR Keys, it will be necessary to place an order for it to be able to initialize the ACS module and the RFID Keys.

This product has been packed with the utmost care. In the case that you receive it damaged or incomplete, please notify immediately your findings to the Carrier.

2. Introduction

The Alberici Cashless System (ACS) is designed to read or write data on the chip transponder (Tag) built into the key-shaped support. Data get stored in the form of units of credit..

The key can be read or written (R/W) only by the RW module sharing the same password (PIN) of the key. Each key and each RW module can be initialized only by means of the programmers.
Keys are available in various colours: green, yellow, blue, red, white (recommended for the Service Keys) and black (recommended for the Master Key).

The ACS makes use of the secure and reliable MIFARE® technology. Exchange of data occurs through radio-frequency signals (RFID): no direct contact is made between components prevent wear-out of the system . The keys are waterproof, resistant and non-reproductible.

The system is ideal for such applications like:

- Automatic distributors
- Car-wash plants
- Automatic Laundrettes
- Gyms and swimming-pools
- Access controls
- Theme parks
- Parking places
- Internet kiosks

The chip transponder contains 45 blocks, 16 bytes each. It can therefore store up to 720 bytes.

Each RW module must control only the keys that have been initialized for that particular module, and inversely each key must be compatible only with the RW modules for which they have been initialized. To this aim, the system is designed so as to make the keys accessible only through password (PIN).

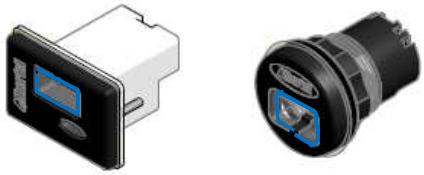
The ACS module must therefore be initialized by making use of the Programmer Kit for Peripheral Units (K-P10-000005) and of the "cctalk-mifare.exe" software provided. At this stage, the 6-digit PIN must be given: the RW reader shall compare its PIN with the one of the inserted key; if their PINs are not the same, the key with such ACS reader (see Section 6.1).

If lost, the password (PIN) cannot be retrieved, not even by Alberici S.p.A.: once the password has been produced for the RW module, it must properly be recorded and kept secret.

To initialize the keys that will work with the relevant ACS module, the ACR Keys Programmer (K-P4N-000007), as well as the "cctalk-mifare.exe" software, must be used. The software itself shall ask to give the key, laying on the programmer interface, the same PIN as the one given to the RW reader that it must work in conjunction with.

3. Parts denomination

ACS (Read-Write) Module



The ACS module contains the RFID aerial and its board.

Key with built-in transponder chip

The key bears the transponder chip, it is waterproof and easily portable. Memory 720 bytes.

Accessories (to be ordered separately)

Programmer for ACS aerial (reader)

It connects to the PC through USB port or RS232 port

ACR Programmer for RFID Keys

It connects to the PC through USB port

4. Product description

4.1 General data

- RW Module

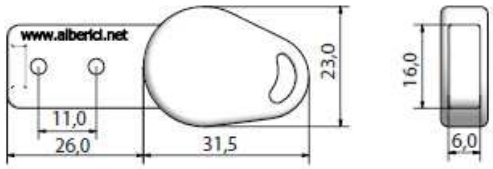
Dimensions W x H x D (mm)	SQUARE: 54 x 36 x (40+8) - ROUND: diam. 43 x (39+8)
Power supply	8 – 30 Vdc
Current draw	Max 60 mA (normal operation) - Max 130 mA (when writing)
Operating temperature	0 / + 50°C
Humidity	0-85% internal / 99% external

- Key

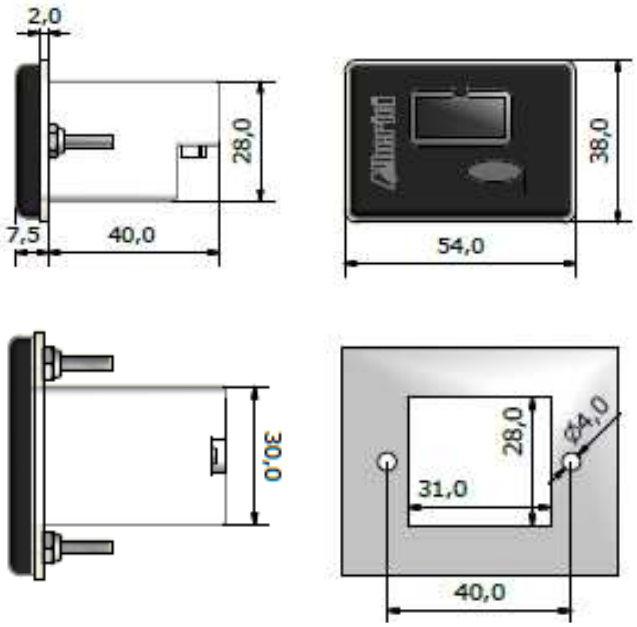
Dimensions W x H x D (mm)	54 x 23 x 9
Memory storage capacity	720 bytes

4.2 Size

RFID Keys

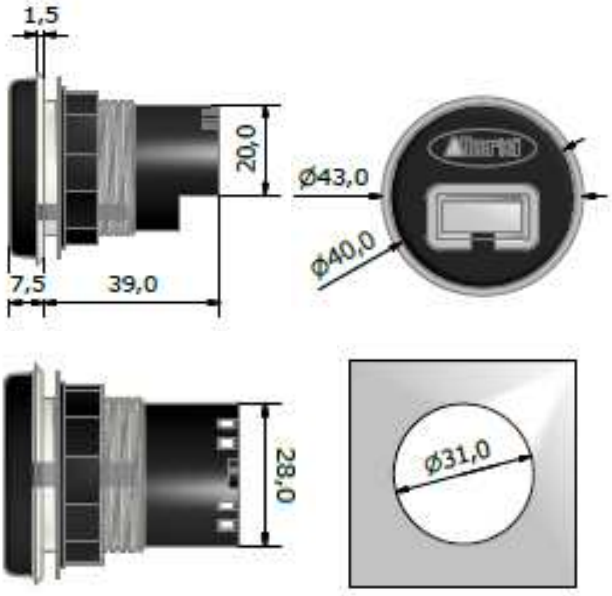


ACS SQUARE MODULE (CH-BS00)



Mounting template

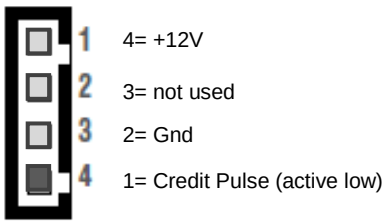
ACS ROUND MODULE (CH-BS01)



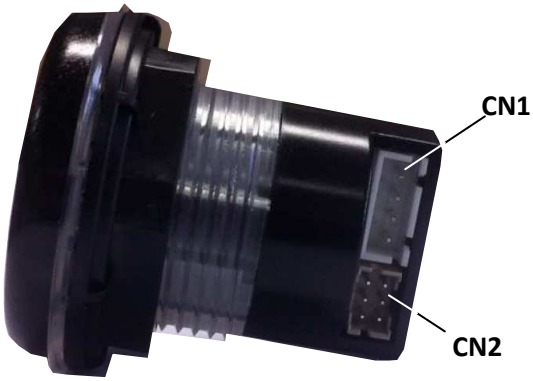
Mounting template

5. Connections

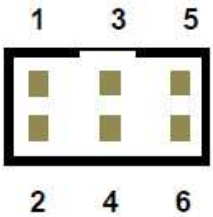
CN1 - power and data socket:



1 4= +12V
2 3= not used
3 2= Gnd
4 1= Credit Pulse (active low)

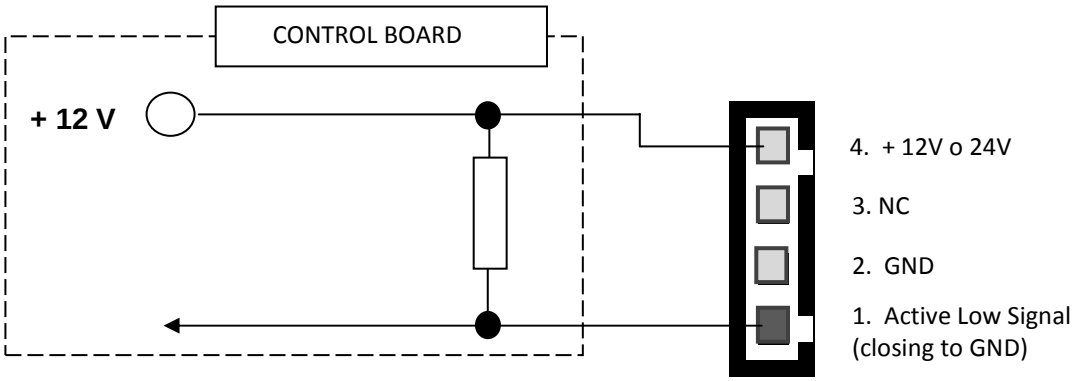


CN2 - socket for optional RGB pushbutton

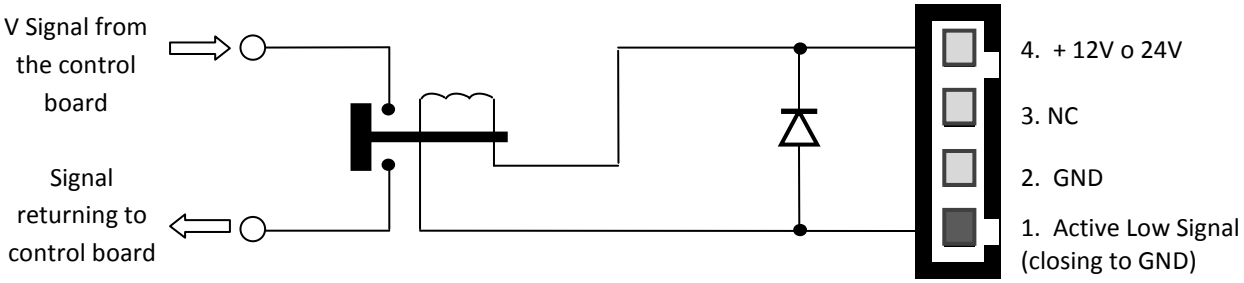


1 Micro NO (n.aperto/n.open)
2 Led R (rosso/red)
3 +12 Vdc (comune /common)
4 Led B (blu/blue)
5 GND
6 Led G (verde/green)

The control board that reads the reader pulse signal must match by Open Collector circuit (i.e. pull-up resistor), exactly as with a pulse mode coin acceptor, as shown in the diagram below:



To make use of the ACS reader as replacement to a mechanical coin acceptor, whose switch simply provides a short-circuit when a coin is accepted, it is necessary to interpose a relay as shown below:



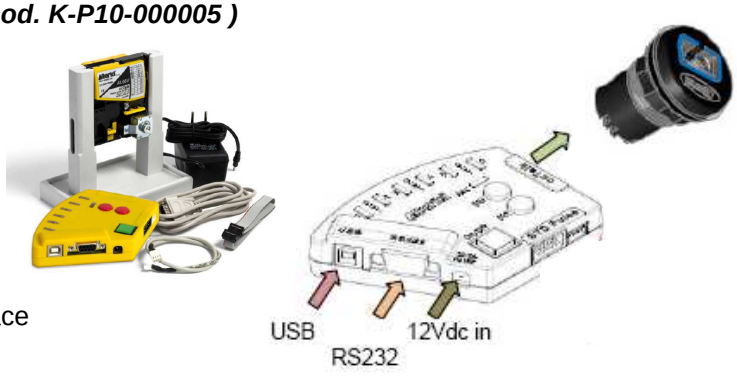
NOTICE: to power the ACS reader, in this latter case it might be convenient to use the Servo MKII Board, which is available for inputs at 230 V a.c., or 24 V a.c., or 24 V d.c., or else 12 V d.c.

6. Initializing the system

If the PC does not contain the USB drivers, please install them before connecting the reader (antenna) programming kit to the PC.
The drivers can be found in the software-CD which is part of the package. The programming software *"cctalk-mifare.exe"* can be found on the same CD.
Such drivers can also be downloaded from the Download Area available in www.alberici-net: Programming Kits / Driver USB / Silicon Labs 2K3 XP Vista 7.rar.
Then from the Start menu of the PC, go to Device Manager (in XP, through System): in the Controller USB or Gate (COM and LPT) list, find the programming interface (USB Serial Converter, or USB Serial Port), and double-click on it. In the window that opens up, choose Driver, click on Driver Update and follow the instructions appearing by and by.

Connecting the reader programming kit (cod. K-P10-000005)

- Connect the power supply box to the 12 Vdc input of the interface.
- Connect the USB cable to the PC and to the USB-A socket of the interface; or else, use the RS232 cable.
- Connect the 4p (3 wires) cable between the cctalk 4p socket of the programming interface and the 4p socket behind the key reader.



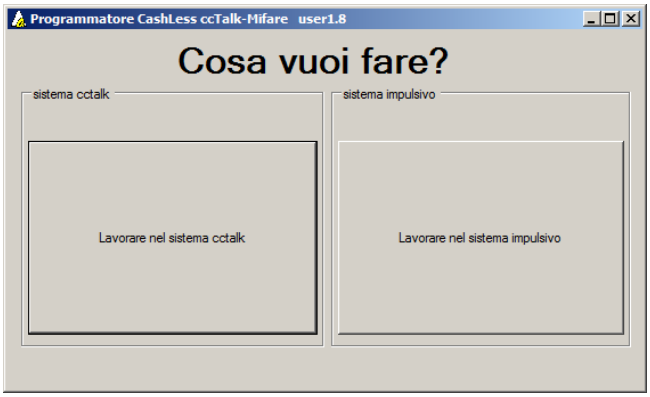
6.1 Initializing the ACS (R/W) module:

Copy the application "*cctalk-mifare.exe*" from the software-CD, and paste it on your PC Desktop.

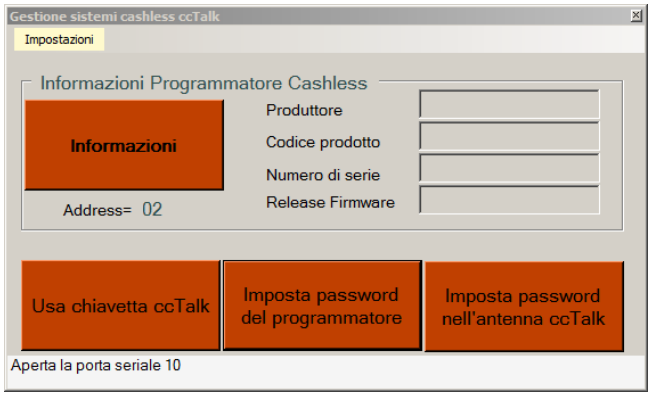
Connect the ACS (aerial) module to be initialized to the RS232 Port or to a USB Port of your PC, through the K-P10-000005 Programmer kit interface (see Section 5).

Open up the program "*cctalk-mifare.exe*".

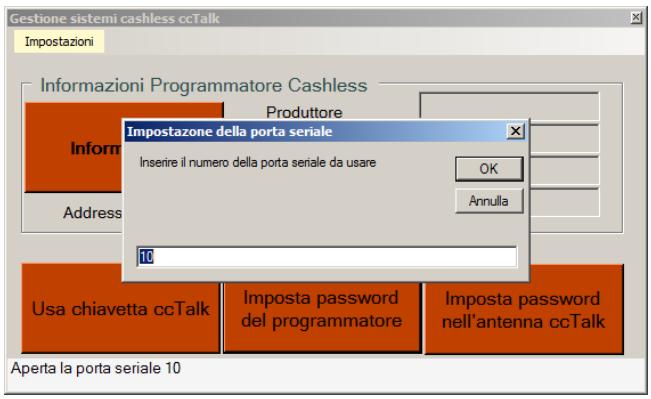
The following prompt will be displaying:



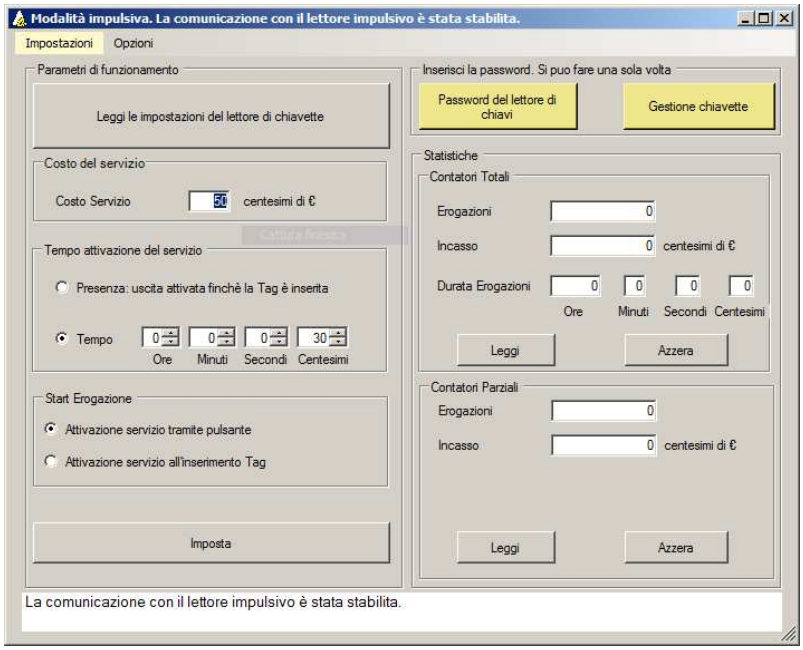
Choose "Sistema Impulsivo" ('operate in Pulse mode'). The following window will appear:



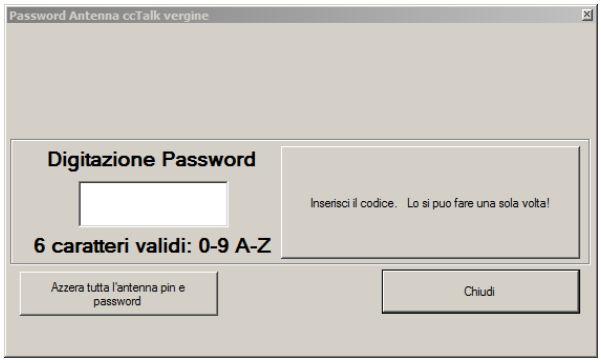
Check that the application reads from the right USB Port: click 'Impostazioni > Porta seriale' ('Setup > Serial Port')', write the right Port nr. (ex. nr. 10) in the white box, and confirm by the OK button. If you connect through RS232, COM Port will most likely be COM 1.



The window bottom bar will prompt to switch off and on. Press twice the green button of the programmer interface, then wait until communication has been set. The following window shall be displayed:



Press the button "Password del lettore di chiavi" ('Key Reader Password): in the white box under "Digitazione Password" ('Type Password in'), do write the 6-digit PIN that will identify from now on this ACS unit, and that shall be used to brand the keys that must work in conjunction with it. The digits can be any alpha-numerical character (0-9, A-Z). Then click the button "Inserisci il codice. Lo si può fare una sola volta!" ('Enter the PIN code. It can be done only once forever!'), and "Chiudi" ('Close window').



The previous window will appear: it is now possible to set up the ACS Reader according to the needs:

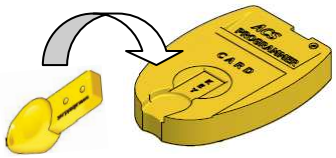
- "Costo del servizio" ('Cost of Service'): this is the value of the credit Pulse, and it must be espressed in hundredths of Euro, i.e. 2 € = 200 units of credit.
- "Modalità di servizio" ('Service mode'): output signal while the key is in (tick "Presenza" = 'Present') *vs* output signal when the inserted key gets removed (uncheck "Presenza" = 'Present').
- "Tempo attivazione del servizio" ('Service activation time-length'): can be set up to around 10 hours when configured to operate as timer control; or in hundredths of second when configured as single or multiple pulses activator.
- "Modalità di attivazione" ('Service activation mode'): automatic when the key is inserted/removed ("Attivazione Servizio all'inserimento Tag" = 'Service start at key introduction'), or after request ("Attivazione Servizio tramite pulsante" = 'Service start by pushbutton').

Press the button "Imposta" ('Set up') to end the setting of the Pulse ACS Module, and disconnect it.

Later on, the configuration of the Pulse ACS module can be checked by pressing the button "Leggere le impostazioni del Lettore di chiavette" ('Read the Key reader setup').

It is now possible to initialize the RFID Keys.

6.2 Initializing the User Keys and loading credit:

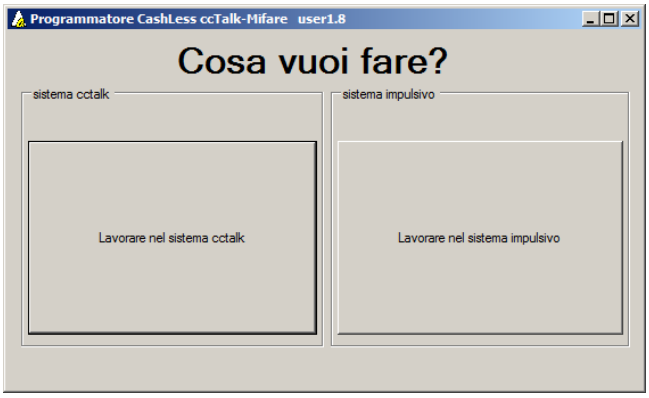


This is done by using the ACR key programmer (K-P4N-000007)

NOTICE: the 6-digit code used to initialize the relevant key reader must be known.

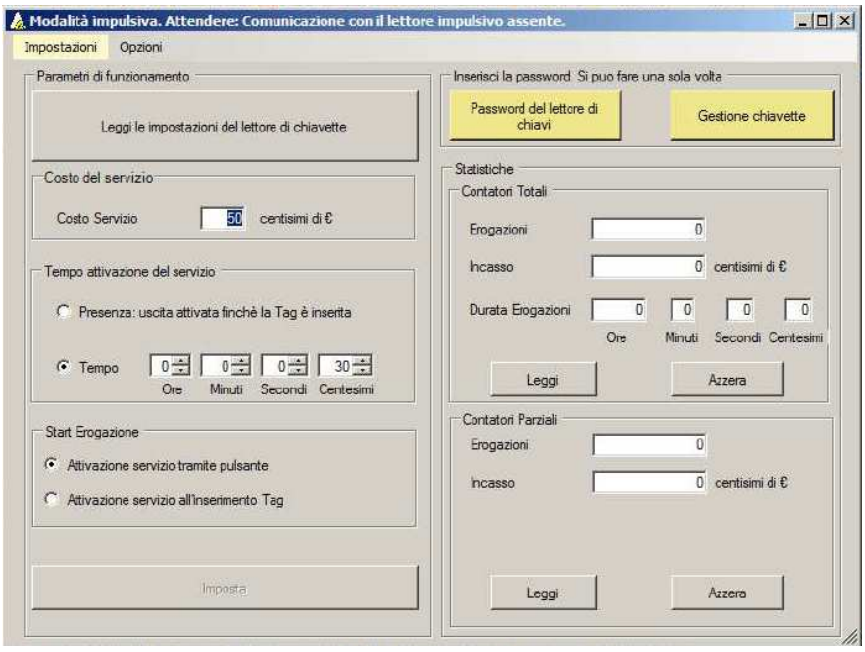
Connect the ACR programmer box to a USB Port of your PC:
it will take about 1 minute to install the drivers and get the programming box ready for use.
In case the programming unit should not find the USB drivers in your PC, they are in the software-CD included, or from the Download Area of www.alberici.net (Download Area / Programmer Kits / Driver Silicon Lab 2K3 XP Vista 7.rar).
From the Start button at the bottom-left of your PC, select Control Panel, then Device Management: among the "Ports (COM and LPT) list, find out the programmer box "Silicon Labs", and double click it. In the setting window that opens up, choose the tag "Driver", and click "Update driver": follow the instructions displaying.
When the programmer box is ready, its pilot light will turn from red to green.

Start the program "*cctalk-mifare.exe*" . The following prompt will be displaying:



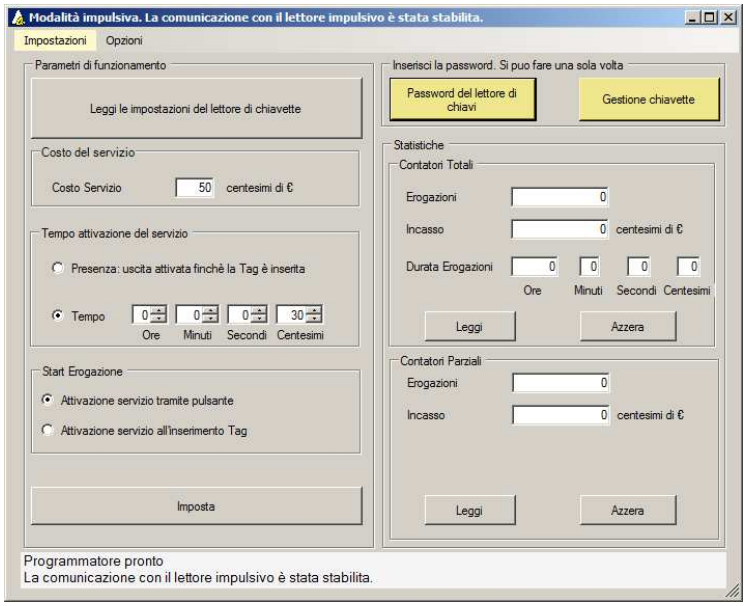
Choose 'Lavorare nel sistema impulsivo' ('Operate in Pulse mode').

The window shown below will appear:

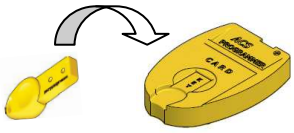


Check that the application reads from the right USB Port: click 'Impostazioni > Porta seriale' ('Setup > Serial Port')', type down the right Port nr. (ex. nr. 10), and confirm by the OK button.

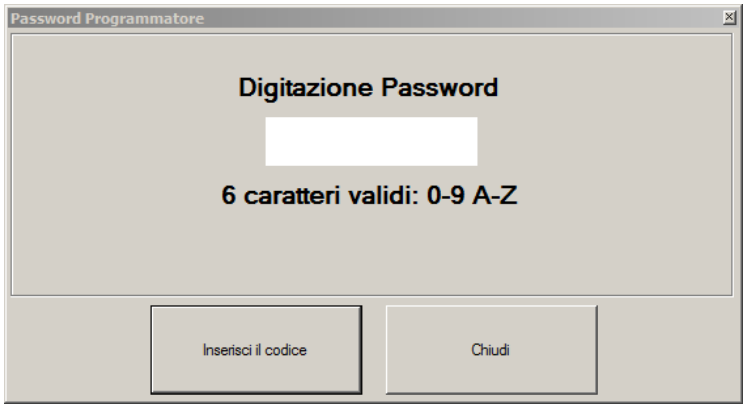
NOTICE: to find out the COM Port, check Start / Control Panel / Device Management / Ports (COM & PLT); the COM nr. shows up in connection with the device 'Silicon Labs': for instance, it may show COM 10.



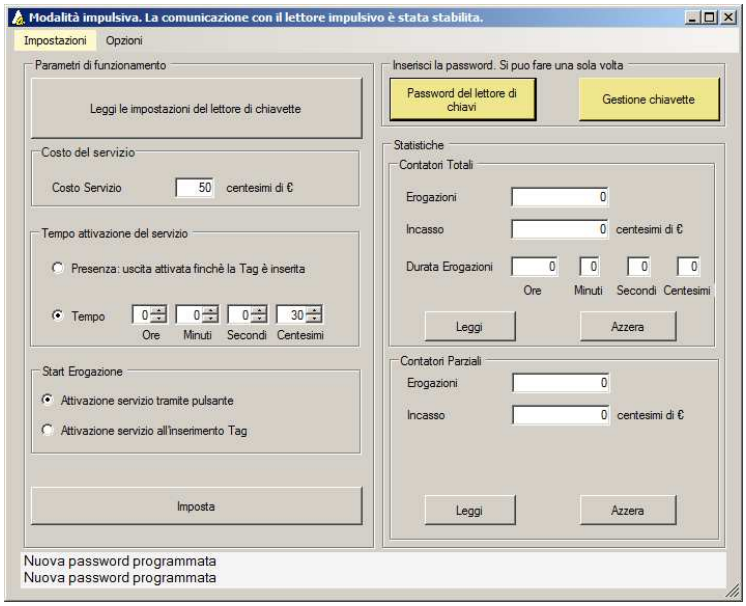
Lay one empty User Key on the programmer shaped seat, and press the button "Password del lettore di chiavi" ('Key Reader Password').



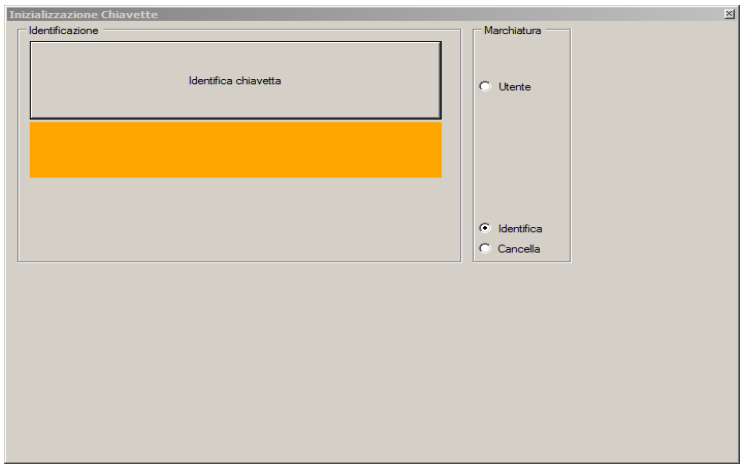
In the white box under "Digitazione Password" ('Type Password in'), write the 6-digit PIN that will identify from now on this RFID Key, and that shall be used to work in conjunction with the ACS Reader that has the same PIN. The digits can be any alpha-numerical character (0-9, A-Z). Then click the button "Inserisci il codice." ('Enter the PIN code.'), and "Chiudi" ('Close window').



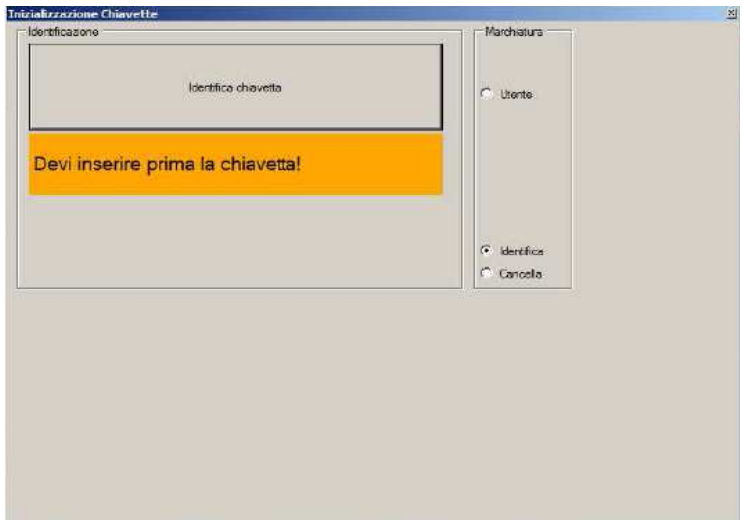
The window bottom bar will confirm "Nuova password programmata" ('New Password has been programmed'). Press "Chiudi" ('Close window').



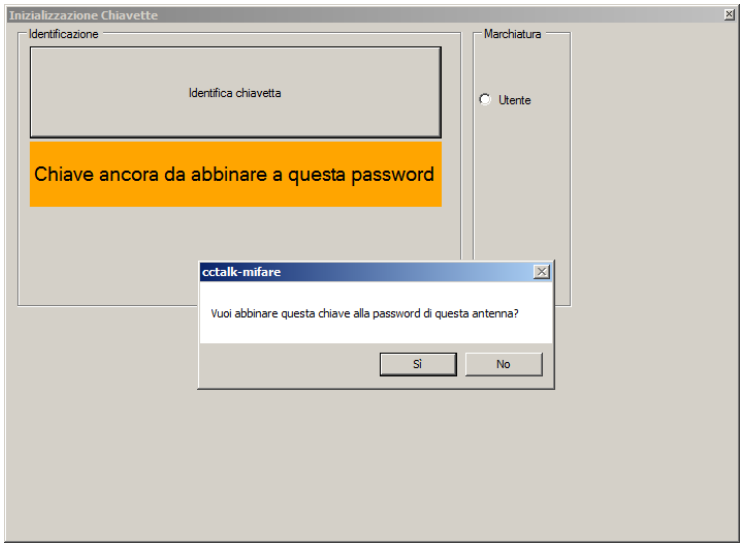
Press the button“Gestione chiavette” (‘Key management’). The window below shall show up:



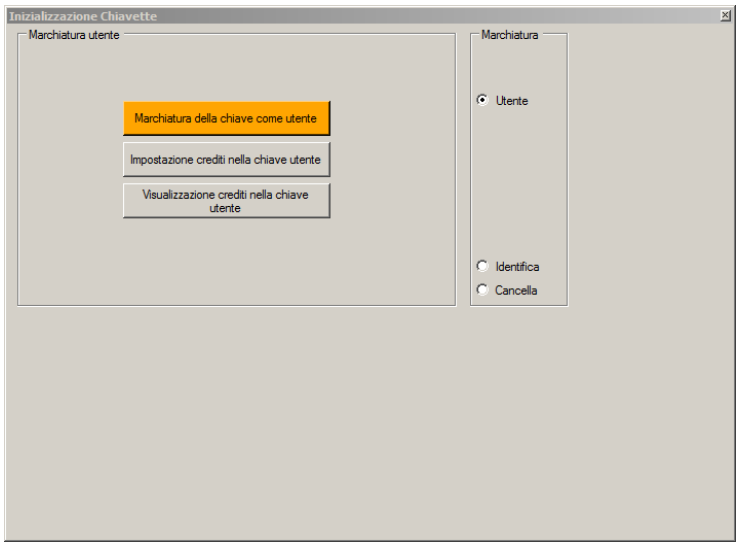
Notice: if there is no key upon the ACR Programmer, the following warning shall show up, “Devi inserire prima la chiavetta!” (‘Please insert key first!’):



When pressing the button “Identifica chiavetta” (‘Identify Key’), the orange bar will warn “Chiave ancora da abbinare a questa password” (‘This key has not been matched to this reader password’). You will be prompted to match the key PIN to the reader PIN: “Vuoi abbinare questa chiave alla password di questa antenna’” (‘Match this Key to this Reader’s password?’):

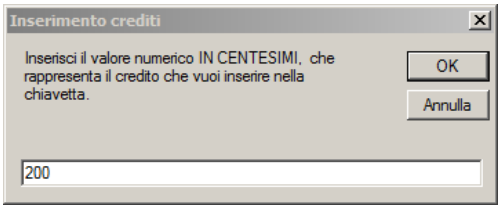


Choose “Sì” (‘Yes’), then tick “Utente” (‘User’). In the window that opens up (see below), press the button “Marchiatura della chiave come Utente” (‘Brand the Key as User’).

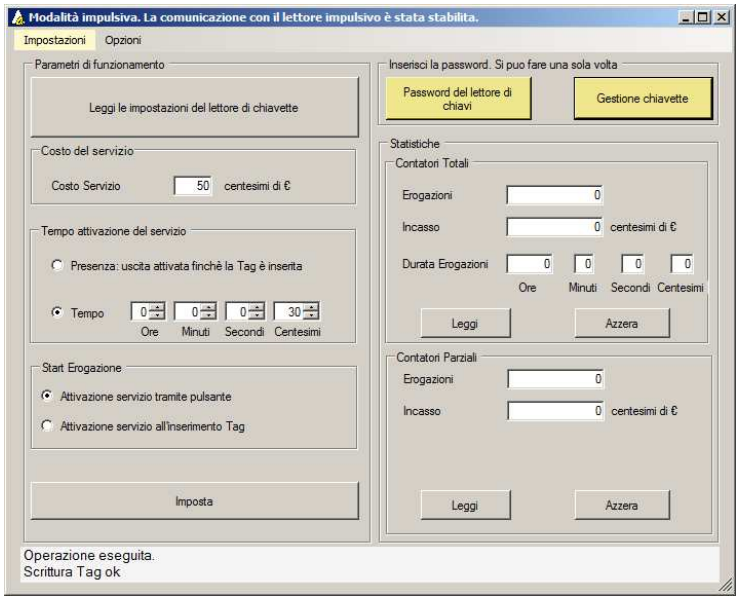


NOTICE: the credit still existing in the key can be checked by pressing the button “Visualizzazione crediti nella chiave Utente” (‘Display credits in the User Key’).

Press “Impostazione crediti nella chiave Utente” (‘Set credits in User key’), to load credits on the key. The “Inserimento crediti” (‘Credits load’) Window will show up: the credit value must be expressed as hundredths of Euro, i.e. 200 credit units = 2 €.
Press OK to confirm.



Exit the Initialization windows: the Window bottom bar will confirm: “Operazione eseguita / Scrittura tag ok” (‘Operation achieved / Tag has been initialized’).



Close down the program windows by clicking on the crossed boxes at top-right corners of each window. Or, repeat the steps to initialize another User key or to fill other initialized User keys with credit.

If one new key or several new keys must match a different key reader, take care to set the 6-digit code of this key reader before initializing this/these User Key(s).

7. Operation

When the device is connected and powered, the blue pilot lights up. If an RGB pushbutton is connected, this also lights up blue. If the module has not been yet initialized, the module and the pushbutton will flash blue.

When the key is inside the module slot, it lights up green, and reads the data contained. If the credit content is void, the module light will be flashing green.
It will flash red if the password of the key does not match the password of the ACS reader module.

When the transmission of the data from the key reader to the control board is in progress, the reader light flashes yellow. It turns again to green after the transmission has ended.

According to how the ACS Module has been set up (Manual or Automatic Start), one of the two processes described below will be started.

ACS Module set up for manual start (i.e. command by pushbutton):
The reader detects the presence of the RFID Key; if this one is filled with enough credits, the reader sets to receive the command for confirming the credit. Press the pushbutton connected to CN2: the output pulse (Active level Low) will appear on pin 1 of CN1. The ACS reader will flash yellow as long as the credit signal remains active. At the credit pulse start, the reader takes off the equivalent of one credit from the amount stored in the User Key.

ACS Module set up for automatic start (i.e. when key is inserted/removed):
The reader detects the presence (or insertion and removal) of the RFID Key; if this one is filled with enough credits, the reader sends out immediately the credit pulse (Active level Low) through pin 1 of CN1. The ACS reader will flash yellow as long as the credit signal remains active. At the credit pulse start, the reader takes off the equivalent of one credit from the amount stored in the User Key.

8. Guarantee

The manufacturer will fix malfunctions arising from production faults in this machine or parts of it within 12 months from the date of sale.

All communications referring to guarantee repairs or replacements must be accompanied by the product serial number and the copy of the sale invoice.
To obtain your guarantee repair, please send the part to the Dealer where you purchased the machine, together with the following documents:
- copy of the sale invoice
- delivery note stating “returned for guarantee repair”
- detailed report of the problem found and the circumstances in which it occurs.

Before sending the product, please get in touch with your Dealer or with Alberici S.p.a. (+39 051 944300); very often malfunctions can be fixed via a simple phone call, saving you costs and time.

Alberici S.p.a. will verify that warranty is applicable, i.e. that problem is not caused by:
- transport damages
- damages from incorrect installation or wrong configuration
- installation in premises or areas not complying with the prescribed safety requirements
- intentional or unwilled tampering
- wrong or careless use or maintenance
- non-compliance with precautions prescribed (see Chapter 4. Caution)
- natural disasters, vandalisms, intentional or unintentional damage

Guarantee is considered automatically expired if outer and inner labels are missing.
Transport costs of repaired products are at the Customer’s charge.

9. Customer Service

Alberici S.p.a. will be pleased to offer all the necessary information on use, ordinary maintenance and technical service.
Please call (+39) 051 944300 and specify if your request concerns information on use or technical support.

NOTA

La Alberici S.p.A. si riserva il diritto di apportare modifiche alle specifiche tecniche dell'apparecchiatura descritta in qualunque momento e senza preavviso, nell'ambito del perseguimento del miglioramento continuo del proprio prodotto.

Alberici®

Progettazione e produzione di sistemi di pagamento, accessori per videogames e macchine vending
Design and manufacture of payment systems, accessories for videogames and vending machines

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