

# CASH-Interface MC8 [CHANGER]

User manual

Board version: v4.07

Software version: v1.75

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## 1. DESCRIPTION

With the CI MC8 board it is possible to build a money changer machine, or a token machine, e.g. for car wash or laundry saloon.

Connection options for bill validator, coin validator, 3x hopper or ticket and note dispenser, receipt printer, LCD display, push buttons and switches, as well as a relay output for an output slot lighting. Additionally a cashless system like [Nayax](#) , [OTI](#) , [USA Technologies](#) , [Sacoa](#) or [Ingenico](#) can be used.

The credits for every coin and bill, as well as the coin value of the hopper are adjusted in the service menu. The display shows “READY” or “CHANGER READY”, depends on the used settings. Inserting money the corresponding credits are added and shown in the LCD display. There are two different payout modes, default or user select mode selectable in the settings. With user select mode the customer can select via push button what type of coin he wants to change. For example hopper 1 holds 1 Euro coins and hopper 2 holds 2 Euro coins. The push buttons are illuminated showing the coin type is ready to payout. If a hopper is empty the button is not illuminated and it is not possible to select that coin type. The button illumination can also be controlled via the hopper value, this means if there are enough credits the corresponding button gets illuminated. With the SINGLE COIN setting the customer can select what hopper to pay out from as long as he has credits left.

In default mode the corresponding amount of coins is paid out directly, without a push button. The amount is reduced and shown on the display by every paid coin. It is possible to change bills to coins and small coins to bigger coins or even bills. Using 3 hoppers there can be paid out 3 different coins or bills. In the service menu the amount of coins for hopper 1-3 can be adjusted for every coin and bill separately.

HINT: The hopper value must be always ascending, that means the smallest coin in hopper 1. Using same coin value for the hoppers will payout alternately with an other hopper for every job.

### **Example change bill to coins**

(hopper1=0,50 EUR, hopper2=1 EUR, hopper3=2 EUR):

5 EUR bill:

Pay out 10x 0,50 EUR

or

Pay out 5x 1 EUR

or

Pay out 3x 1 EUR + 1x 2 EUR

or

Pay out 1x 1 EUR + 2x 2 EUR

or

Pay out 2x 0,50 EUR + 2x 2 EUR

The number of coins per hopper can be set separately for each bill, as well as the 1 EUR and 2 EUR coin. Thus, any constellation of output is possible.

### **Example change coins into coins**

(hopper1=0,50 EUR, hopper2=1 EUR, hopper3=2 EUR):

Small coins are inserted, e.g. 10 cent. Reaching a total of 0,50 EUR and no more pay in within 4 seconds a 0,50 EUR coin is paid out, else reaching the total of 1 EUR a 1 EUR coin is paid out, otherwise upon reaching 2 EUR a 2 EUR coin is paid out. The time to wait is adjustable, default is 4 seconds.

### **Example change coins into bill**

(hopper 3 note dispenser = 10 EUR):

Coins are thrown in. Reaching a total of 10 EUR a 10 EUR bill is paid out.

It is possible to control 3 hoppers (coin or note dispenser). Every hopper connection can be used for coin or bill pay out. The corresponding coin or bill value can be adjusted in the service menu.

Every of the 3 hoppers is monitored for EMPTY and FULL, that means if one hopper is empty the acceptance of money is disabled and shown in the LCD display. The FULL signal can control a coin sorter and redirect the coin to the main cash box instead to the hopper. The EMPTY control can be activated for every connected hopper by a menu setting. The FULL control is activated via jumper on the board.

## **2. SERVICE MENU**

The SERVICE menu is activated via the SERVICE button on the board. It is possible to connect an external push button to jumper JP 1.5. Select the menu items by further pressing the SERVICE button. Hold down the SERVICE button to automatically switch through all menu items. With the SERVICE button you move forward, with the LEFT button you move backwards thru all menu settings.

Change settings of the active menu item with the START button (increase or toggle value, or select function), or with the DOWN button (decrease or toggle value, or select function). It is possible to connect an external push button to jumper JP 1.4. Hold down the START or DOWN button for repeat function (very fast count after 100 steps).

Push LEFT and SERVICE button at the same time exists the service menu, this is the same then using EXIT.

## 2.1 Menu items

Currently the SERVICE menu contains 80 menu items.

#####

- 1: SOFTWARE and VERSION  
shows the software and version number, e.g. CI MC8 CHANGER, VERSION: 1.71
- 2: STATUS H-EMPTY  
shows the empty state for hopper 1-3: H1=E H2=E H3=E  
(E=EMPTY, F=FULL means NOT EMPTY)
- 3: CREDIT  
displays the current balance, e.g. 10.00
- 4: TOTAL – IN  
shows how much money was totally inserted (cash register counter)
- 5: HOPPER1 OUT  
shows how many coins have been paid out by hopper 1  
On "CLEAR" and hopper level active, this number is added to HOPPER1 LEVEL.
- 6: HOPPER2 OUT  
shows how many coins have been paid out by hopper 2  
On "CLEAR" and hopper level active, this number is added to HOPPER2 LEVEL.
- 7: HOPPER3 OUT  
shows how many coins have been paid out by hopper 3  
On "CLEAR" and hopper level active, this number is added to HOPPER3 LEVEL.
- 8: HOPPER1 - LEVEL  
Level indicator for hopper1, shows how many coins are remaining in the hopper1.
- 9: HOPPER2 - LEVEL  
Level indicator for hopper2, shows how many coins are remaining in the hopper2.
- 10: HOPPER3 - LEVEL  
Level indicator for hopper3, shows how many coins are remaining in the hopper3.
- 11: HOPPER1 PAYOUT 20 COINS  
pays out 20 coins from hopper1, for example to empty the hopper
- 12: HOPPER2 PAYOUT 20 COINS  
pays out 20 coins from hopper2, for example to empty the hopper
- 13: HOPPER3 PAYOUT 20 COINS  
pays out 20 coins from hopper3, for example to empty the hopper
- 14: EXIT - CLOSE SERVICE  
exits the SERVICE-MENU and saves all settings.
- 15: BILL1 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill1, number of coins to pay via hopper1
- 16: BILL1 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill1, number of coins to pay via hopper2
- 17: BILL1 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill1, number of coins to pay via hopper3
- 18: BILL2 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill2, number of coins to pay via hopper1

- 19: BILL2 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill2, number of coins to pay via hopper2
- 20: BILL2 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill2, number of coins to pay via hopper3
- 21: BILL3 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill3, number of coins to pay via hopper1
- 22: BILL3 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill3, number of coins to pay via hopper2
- 23: BILL3 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill3, number of coins to pay via hopper3
- 24: BILL4 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill4, number of coins to pay via hopper1
- 25: BILL4 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill4, number of coins to pay via hopper2
- 26: BILL4 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill4, number of coins to pay via hopper3
- 27: BILL5 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill5, number of coins to pay via hopper1
- 28: BILL5 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill5, number of coins to pay via hopper2
- 29: BILL5 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill5, number of coins to pay via hopper3
- 30: BILL6 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill6, number of coins to pay via hopper1
- 31: BILL6 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill6, number of coins to pay via hopper2
- 32: BILL6 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill6, number of coins to pay via hopper3
- 33: BILL7 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill7, number of coins to pay via hopper1
- 34: BILL7 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill7, number of coins to pay via hopper2
- 35: BILL7 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept bill7, number of coins to pay via hopper3
- 36: EUR 1 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept 1 Euro (coin value 100), number of coins to pay via hopper1
- 37: EUR 1 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept 1 Euro (coin value 100), number of coins to pay via hopper2
- 38: EUR 1 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept 1 Euro (coin value 100), number of coins to pay via hopper3
- 39: EUR 2 - HOPPER1 (Byte 0..255), Setting range 0-250, default setting 0  
On accept 2 Euro (coin value 200), number of coins to pay via hopper1
- 40: EUR 2 - HOPPER2 (Byte 0..255), Setting range 0-250, default setting 0  
On accept 2 Euro (coin value 200), number of coins to pay via hopper2
- 41: EUR 2 - HOPPER3 (Byte 0..255), Setting range 0-250, default setting 0  
On accept 2 Euro (coin value 200), number of coins to pay via hopper3

- 42: COIN #1, Setting range 0-50000, default setting 50 (0,50 EUR)  
value for coin channel 1.
- 43: COIN #2, Setting range 0-50000, default setting 100 (1 EUR)  
value for coin channel 2.
- 44: COIN #3, Setting range 0-50000, default setting 200 (2 EUR)  
value for coin channel 3.
- 45: COIN #4, Setting range 0-50000, default setting 0  
value for coin channel 4. Hint: needs to use BINARY protocol
- 46: COIN #5, Setting range 0-50000, default setting 0  
value for coin channel 5. Hint: needs to use BINARY protocol
- 47: COIN #6, Setting range 0-50000, default setting 0  
value for coin channel 6. Hint: needs to use BINARY protocol
- 48: COIN #7, Setting range 0-50000, default setting 0  
value for coin channel 7. Hint: needs to use BINARY protocol
- 49: BILL #1, Setting range 0-50000, default setting 500 (5 EUR)  
value for bill channel 1.
- 50: BILL #2, Setting range 0-50000, default setting 1000 (10 EUR)  
value for bill channel 2.
- 51: BILL #3, Setting range 0-50000, default setting 2000 (20 EUR)  
value for bill channel 3.
- 52: BILL #4, Setting range 0-50000, default setting 0  
value for bill channel 4.
- 53: BILL #5, Setting range 0-50000, default setting 0  
value for bill channel 5. Hint: needs to use BINARY protocol
- 54: BILL #6, Setting range 0-50000, default setting 0  
value for bill channel 6. Hint: needs to use BINARY protocol
- 55: BILL #7, Setting range 0-50000, default setting 0  
value for bill channel 7. Hint: needs to use BINARY protocol
- 56: COIN PROTOCOL, PARALLEL or BINARY, default setting PARALLEL  
coin validator transmission protocol. More than 3 coins needs to use BINARY protocol
- 57: BILL PROTOCOL, PARALLEL or BINARY, default setting PARALLEL  
bill validator transmission protocol. More than 4 bills needs to use BINARY protocol
- 58: B-PULSE, Setting range 1-50000, default setting 0 (use with pulse)  
value for one bill pulse if PULSE protocol is used.
- 59: COMMA, OFF or ON, default setting ON  
OFF=show credits without comma, ON=show credits with comma
- 60: HOPPER1 VALUE, Setting range 1-50000, default setting 100  
value for hopper1 coin
- 61: HOPPER2 VALUE, Setting range 1-50000, default setting 0  
value for hopper2 coin
- 62: HOPPER3 VALUE, Setting range 1-50000, default setting 0  
value for hopper3 coin
- 63: MONITOR H1, OFF or ON, default setting OFF  
hopper1 empty detection. Set to OFF if HOPPER LEVEL COUNT is active!
- 64: MONITOR H2, OFF or ON, default setting OFF  
hopper2 empty detection. Set to OFF if HOPPER LEVEL COUNT is active!



- 65: MONITOR H3, OFF or ON, default setting OFF  
hopper3 empty detection. Set to OFF if HOPPER LEVEL COUNT is active!
- 66: HOPPER LEVEL COUNT, OFF or ON, default is OFF  
activate level indicator. Note hint for level counter!
- 67: HOPPER USER SELECT, OFF or ON, default setting OFF  
User selects hopper number via push button
- 68: ILLUM., BY CREDIT or ALWAYS, default setting ALWAYS  
push button illumination by credit or hopper empty detection
- 69: SINGLE COIN, OFF or ON, default setting OFF  
if user select is active, only one coin per button press or complete credits
- 70: H-PULSE TIME, Setting range 1-500, default setting 50  
hopper pulse signal time, e.g. MK4 hopper it is min. 5ms
- 71: PRINTER RECEIPT, OFF or ON, default setting OFF  
receipt printer, must support pulse interface, e.g. GP-58
- 72: P-PULSE VALUE, Setting range 1-50000, default setting 100  
receipt printer pulse value
- 73: DELAY VALUE, Setting range 1-10, default setting 4  
delay until payout job starts.  
Needed if small coins are inserted
- 74: RELAYS TIME, Setting range 1-10, default setting 4  
ON time for the on board relays. Time or output shaft illumination.
- 75: ACCEPT – MAXCREDIT, Setting range 0-50000, default setting 50000  
If MAXCREDIT is reached cash acceptance is disabled.
- 76: LINGO, ENGLISH or DEUTSCH or HUNGARIAN, default setting ENGLISH  
customer language used in the LCD display. Menu language is always english
- 77: SHOW, READY or CHANGER READY, default setting CHANGER READY  
display on standby, READY or CHANGER READY.
- 78: SETTINGS BACKUP  
backup all settings to internal EEPROM
- 79: SETTINGS RESTORE  
restore all settings from internal EEPROM
- 80: EXIT CLOSE SERVICE, exits the SERVICE-MENU and saves all settings  
Exits SERVICE and saves all settings.

#####

Acceptance of money is disabled while service.

All data and settings are saved when you EXIT the service menu, means you have to leave the service menu always by EXIT or made changes are lost.

The protocol for coin and bill validator can be separately selected, PARALLEL or BINARY (PAR or. BIN).

Coin validator in PARALLEL protocol: 3 coins possible (#1 - #3)

Coin validator in BINARY protocol: 7 coins possible (#1 - #3 BINARY CODED)

Bill validator in PARALLEL protocol: 4 bills possible (#1 - #4)

Bill validator in BINARY protocol: 7 bills possible (#1 - #4 BINARY CODED)

Using bill validator with pulse protocol, the pulse value must be set at the B-PULSE setting, e.g. 100 if the bill validator gives out 1 pulse per Euro.

If bill validator works with PARALLEL or BINARY protocol, the value for B-PULSE must be set to 0 !!!

The coin value must be ascending, that means the smallest coin in hopper1. On same coin value the payout is done alternately between that hoppers.

In the service menu the hopper empty state is shown for hopper1-3.

Additionally there can be 20 coins paid for every hopper, e.g. this is useful to empty a hopper.

If there are more then 10 coins to pay out via a hopper we do a 2 seconds delay between every 10 coins to avoid coin jam.

“DELAY - VALUE” setting is the time to wait on insert coins, before the pay out job starts, e.g. if there are several 50 cent coins are inserted.

„RELAYS – TIME“ setting is the time the relays stays on after a payout job, e.g. to illuminate the output shaft.

### 3. DEVICES

#### 3.1 Bill validator

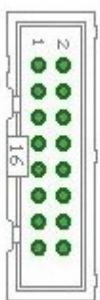
Of the type NV9, NV10 or pin compatible.

GBA HR1/ST1/ST2 via adapter possible.

Protocol: PARALLEL (default), PULSE or BINARY.

Hint: Using the PULSE protocol, the pulse value must be set on B-PULSE setting!

Pin out of the BILL plug:



- Pin 1 = +12V DC
- Pin 2 = 0V
- Pin 3,4,5,6 = MDB (not used)
- Pin 7 = Busy (act. low)
- Pin 8 = Escrow (not used)
- Pin 9,10,11,12 = Inhibit 1-4 (blocking = High, accept = Low)
- Pin 13 = Vend 3 (Note channel 3, act. low)
- Pin 14 = Vend 4 (Note channel 4, act. low)
- Pin 15 = Vend 1 (Note channel 1, act. low)
- Pin 16 = Vend 2 (Note channel 2, act. low)



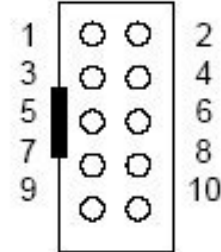
### 3.2 Coin validator

Of the type NRI-G13, RM5, EMP800 or pin compatible.

Protocol: PARALLEL (default), PULSE or BINARY.

Pin out of the COIN plug:

pin	assignment	potential
1	GND	low
2	UB +12V DC	high
3	output line 5	act. low
4	output line 6	act. low
5	return	act. low
6	total blocking	act. high
7	output line 1	act. low
8	output line 2	act. low
9	output line 3	act. low
10	output line 4	act. low



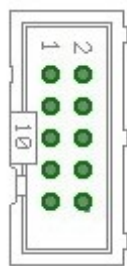
A coin sorter can be directed to the main cash box via hopper full signal, e.g. EMP 800.00/P V6 /O or /N /X Pin4 Low sorter control and SRT 800.2X or SRT 800.3X

### 3.3 Hopper

Hopper of the type Azkoyen U-II, Flow-Hopper, Hopper HS-2012 (STD) via MK4 adapter, MK2/3/4 via MK4 adapter, Note dispenser ND300KM via ND300KM adapter,

Protocol: PULSE

Pin out of the HOPPER plug:



- Pin 1,2,3 = +V (+12V or +24V DC)
- Pin 4,5 = -V (GND)
- Pin 6 = Full sensor
- Pin 7 = Motor run (IN3)
- Pin 8 = Not used (security / error)
- Pin 9 = Coin signal (select by JP2.1 or JP2.3)
- Pin 10 = Empty sensor

If a hopper becomes empty while pay out process, e.g. a 500 Euro banknote shall be changed into 2 Euro coins (corresponds to 250 coins), the control tries to pay out the remaining coins by the next hopper. Is the coins count bigger or equal than 10 coins, the hopper empty detection will be monitored again every 10 coins and pay out is changed to the next hopper if needed.

If all hoppers become empty while pay out process, the control signals “HOPPER EMPTY”. In the second row of the LCD display the remaining credits are still shown. Now the service personal must fill up the hoppers. To continue the pay out of the remaining coins, the service personal must push a button connected to the A.5 input, or the START button on the CI MC8 board, after the fill up job is finished. The input A.5 (JP2.6) normally is the “OUT OF SERVICE” trigger, but if there are credits left, the pay out job continues.

### 3.4 Hopper Level Count

A level indicator can be activated with the HOPPER – LEVEL COUNT setting. The level number, means amount of coins, can be set at the HOPPER1-3 LEVEL setting, e.g. 1000 coins. The level counter decreases with every paid coin and shows for every hopper the exactly number of remaining coins.

If the hopper level count function is activated, this is used to set the machine to “out of order” state instead of the real hopper empty detection. In order to automatically check if there are enough coins left for a change job, the control first checks if there are numbers assigned for the hoppers in the bill settings. The highest coin number for hopper1-3 is the border line for “HOPPER EMPTY – OUT OF ORDER”. If there is no hopper assignment done for the bills, the border line is calculated by the highest banknote, e.g. max. 20 Euro banknote, and 50 cent in the hopper means  $2000 \div 50 = 40$  coins. Not used bill channels (BILL #1-7) must be set to 0.

If one of the hopper1-3 OUT counters is cleared, we add that number to the level counter. This is exactly the number of coins the operator has to refill to have the start level, e.g. 1000.

### 3.5 Printer

It is possible to connect a receipt printer to the JP2-9 connector. The printer must work with PULSE protocol, e.g. the printer ICT GP-58. In the SERVICE menu the printer can be activated and the pulse value can be adjusted. Default value 100, this means there is one pulse on JP2-9 for 100 credit. If printing receipt is activated the customer can select to print a receipt via the START push button (jumper JP1.4). The push button can be illuminated via RELAYS output (jumper JP1.1 is the relays closer contact). Pressing the START push button the RELAYS is active for 60 seconds and signals printing of a receipt. If the printer is not selected in the settings, the RELAYS is active while payout and can be used for illumination of the output shaft.

If the printer is not selected in the settings, the RELAYS is active while payout and can be used for illumination of the output shaft. The time for the relays can be set in the SERVICE MENU, “RELAYS” setting.

### 3.6 LCD-Display

Type 162 with 44780 controller via 10 pin flat ribbon cable + LCD Interface or compatible, e.g. OLED with KS0070 or KS0073 controller.

### 3.7 Relays output

Closer contact, NO 200 VDC, 15Watts e.g. illumination output shaft.

### 3.8 Cashless systems

Currently the following credit and smart card systems can be connected:

[Nayax cashless payments vpos](#)

[USA Technologies ePort G9 und ePort G10-S](#)

[Otiglobal cashless payment systems otipulse](#)

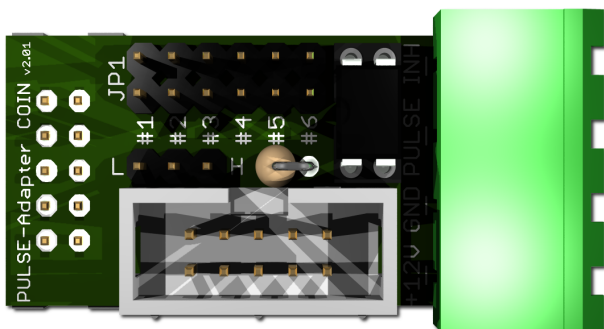
[Sacoa Debit Card, POS and Redemption System](#)

[Ingenico pos solutions smart pos self-service](#)

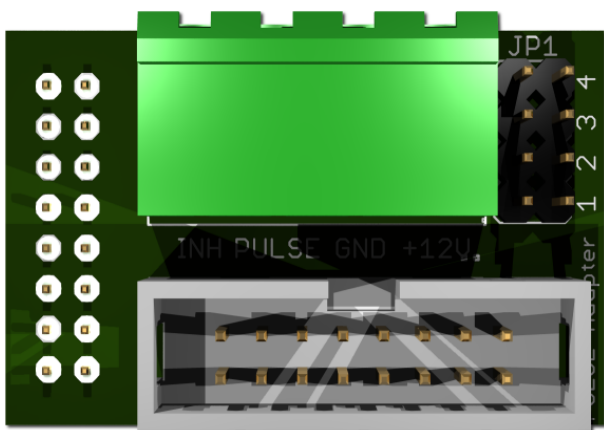
Please inform about the exact features of the cashless systems directly at the manufacturer. The above listed devices can be connected without any problems to the CI MC8 board. The device must work with PULSE Interface. Further information on the wiring of the corresponding system can be obtained from us on request.

### 3.9. PULSE-Adapter

Another possibility to connect the Nayax (or other cashless system) PULSE wire is to use our PULSE-Adapter. There are two types of the PULSE-Adapter available, a COIN and a BILL version.



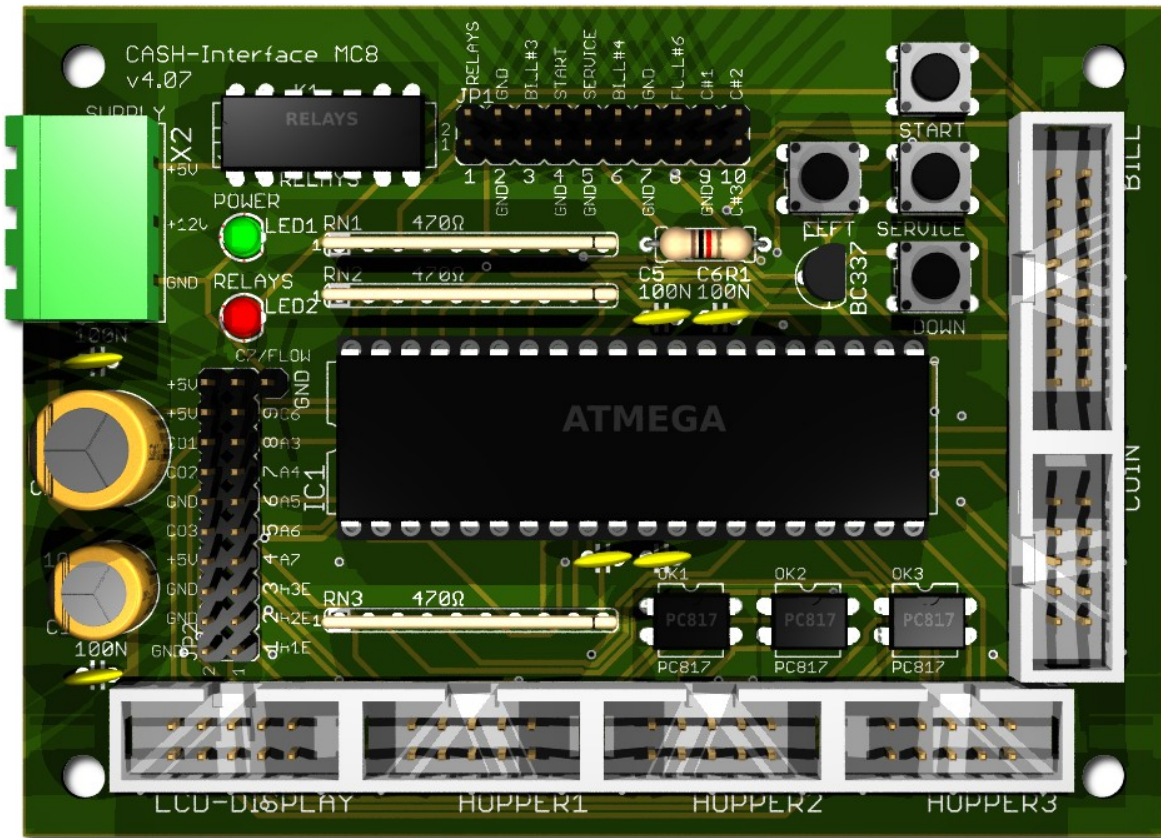
The **PULSE-Adapter COIN** has a 10 pin connector that fits to default coin plugs, and offers again a 10 pin coin plug to plug in the originally coin acceptor cable, so you do not lose the coin acceptor connector. The cashless device can be connected easily via plugable terminal connector. With a jumper you can select the coin channel on which the external credit signal is transferred. Additionally there is an INHIBIT out, to control the acceptance of the Nayax device.



The **PULSE-Adapter BILL** has a 16 pin connector that fits to default NV9/NV10 plugs, and offers again a 16 pin plug to plug in the originally bill acceptor cable, so you do not lose the bill acceptor connector.

The PULSE-Adapter BILL offers the same options as the above PULSE-Adapter COIN, select the bill channel by jumper and a INHIBIT output.

## 4. CASH-INTERFACE MC8 BOARD



### 4.1 Jumper

JP1.1 - RELAYS, Pin1=K1/14, Pin2=K1/8	Relays closer contact (NO)
JP1.2 - GND, Pin3=GND, Pin4=GND	GND
JP1.3 - C.2, Pin5=bill #3, Pin6=C.2	monitor bill #3
JP1.4 - START, Pin7=GND, Pin8=C.4	external START button
JP1.5 - SERVICE, Pin9=GND, Pin10=C.5	external SERVICE button
JP1.6 - C.3, Pin11=bill #4, Pin12=C.3	monitor bill #4
JP1.7 - GND, Pin13=GND, Pin14=GND	GND
JP1.8 - Hopper Full, Pin15=coin #6, Pin16=H1-H3 FULL	monitor Hopper FULL
JP1.9 - COIN, Pin17=GND, Pin18=coin#1	COIN#1
JP1.10 - COIN, Pin19=coin#2, Pin20=coin#3	COIN#2 + COIN#3
JP2.1 - Pin1=Hopper1 EMPTY, Pin2=COIN1 SIGNAL	Hopper1 EMPTY, hopper1 coin signal
JP2.2 - Pin3=Hopper2 EMPTY, Pin4=COIN2 SIGNAL	Hopper2 EMPTY, hopper2 coin signal
JP2.3 - Pin5=Hopper3 EMPTY, Pin6=COIN3 SIGNAL	Hopper3 EMPTY, hopper3 coin signal
JP2.4 - A7, Pin7=A7, Pin8=+5V	Illumination Payout button 3 or error signal ACTIVE LOW
JP2.5 - Menu EXIT, Pin9=A.6, Pin10=GND	Menu EXIT
JP2.6 - Out of service, Pin11=A.5, Pin12=GND	manually Out of order input
JP2.7 - Menu value DOWN, Pin13=A.4, Pin14=GND	Menu value DOWN
JP2.8 - Menu LEFT, Pin15=A.3, Pin16=GND	Menu LEFT
JP2.9 - Printer PULSE, Pin17=C.6, Pin18=+5V	Printer PULSE or illumination payout button 1
JP2.10 - Printer pulse total, Pin19=C.7, Pin20=+5V	Printer PULSE total or illumination payout button 2



## 4.2 Micro controller

ATMega1284 (8 MHz internal clock) I/O ports:

Port A.0 - Hopper1 Empty, not empty=LOW

Port A.1 - Hopper2 Empty, not empty=LOW

Port A.2 - Hopper3 Empty, not empty=LOW

Port A.3 - Menu LEFT (select pay out hopper 1)

Port A.4 - Menu value DOWN (select pay out hopper 2)

Port A.5 - Out of service (pull down to GND, e.g. via daily timer or switch,  
or push button to restart payout after hopper empty and refill.

Port A.6 - Menu EXIT (select pay out hopper 3)

Port A.7 - illumination pay out button 3, or error signal = ACTIVE LOW

Port B.0 - Coin #1, Active LOW

Port B.1 - Coin #2, Active LOW

Port B.2 - Coin #3, Active LOW

Port B.3 - Hopper3 pulse

Port B.4 - Hopper1 pulse

Port B.5 - Hopper2 pulse

Port B.6 - Accept coin and bill validator, Active LOW (INHIBIT)

Port B.7 - Relays, Active HIGH, JP1.1 is a closer contact NO

Port C.0 - Bill #1, Active LOW

Port C.1 - Bill #2, Active LOW

Port C.2 - Bill #3, Active LOW

Port C.3 - Bill #4, Active LOW

Port C.4 - Push button 1, START, JP1.4, Active LOW, (select print receipt)

Port C.5 - Push button 2, SERVICE MENU, JP1.5, Active LOW,

Port C.6 - Printer pulse (or illumination pay out button 1)

Port C.7 - Printer pulse total (or illumination pay out button 2)

Port D.0 - LCD 1, DB4

Port D.1 - LCD 1, DB5

Port D.2 - LCD 1, DB6

Port D.3 - LCD 1, DB7

Port D.4 - LCD 1, Enable

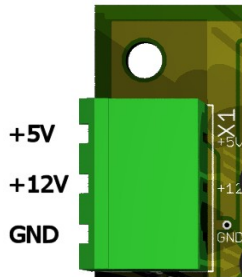
Port D.5 - LCD 1, RS

Port D.6 - LCD 1, RW

Port D.7 - LCD 2, Enable => 2 LCD

## 5. CONNECTIONS

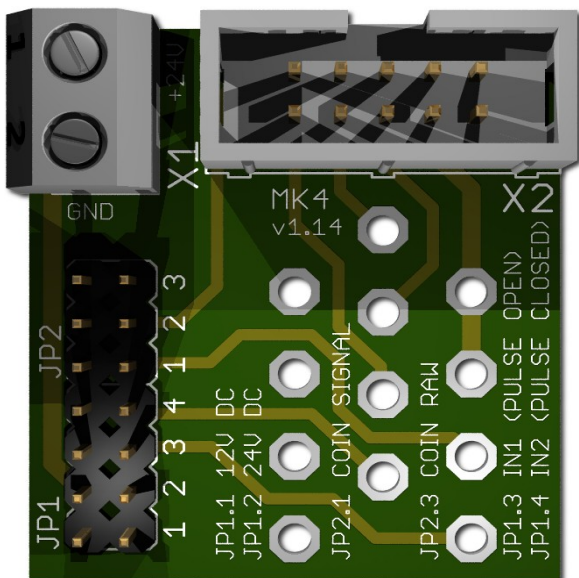
### 5.1 Power supply



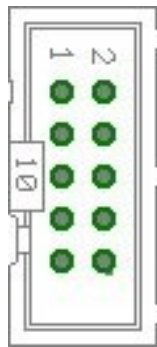
The power supply is connected to terminal plug X1.

The CASH-Interface MC8 needs a supply voltage of +5V and +12V DC. The ground connections (GND) of both voltage must be connected. The interfacing of +5V, +12V and GND is printed on the board.

### 5.2 MK4-Adapter



Occupation of the 10 pole plug (Azkoyen compatible):



- Pin 1,2,3 = +V (+12V o. +24V DC)
- Pin 4,5 = -V (GND)
- Pin 6 = Full Sensor
- Pin 7 = Motor run
- Pin 8 = Not used
- Pin 9 = Coin signal
- Pin 10 = Empty sensor

We offer beside this CHINCH also an BULGIN version in our web shop.

X1-1: +24V DC

X1-2: GND

JP1.1 : +12V Hopper, power from CASH-Interface

JP1.2 : +24V Hopper, power from external power supply on plug X1

JP1.3 : IN1 (mode selector)

JP1.4 : IN2 (mode selector)

Mode 0 (Direct switching 24V) : JP1.3 open + JP1.4 open

Mode 1 (Logic control / motor run) : JP1.3 closed + JP1.4 closed

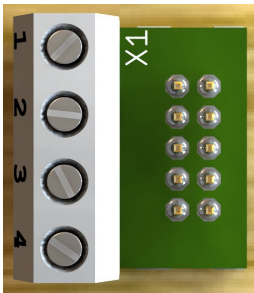
Mode 2 (Coin counting / pulse) : JP1.3 open + JP1.4 closed

JP2.1 : Coin ( $\mu$ P Sensor Output) => short JP2.1 and JP2.2

JP2.3 : Coin raw (Raw Sensor Output) => short JP2.3 and JP2.2



### 5.3 ND300-Adapter

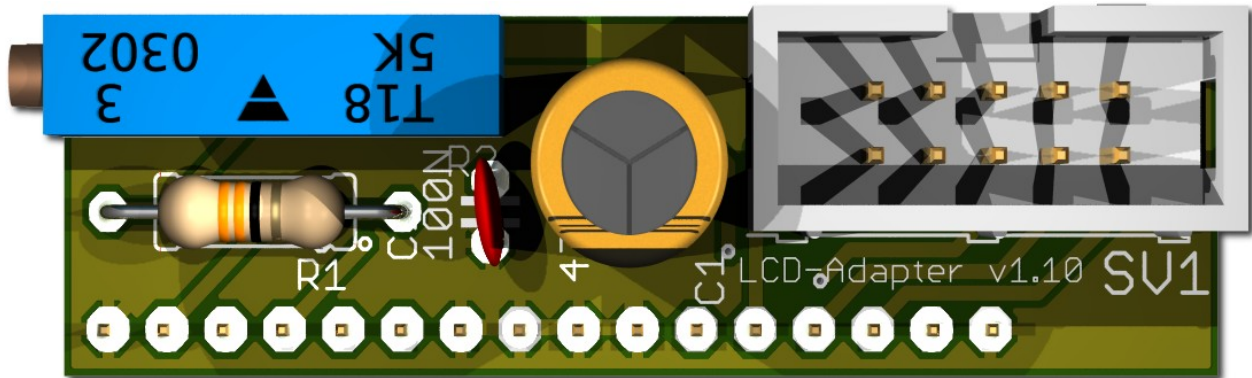


Connects a ND300 note dispenser on the HOPPER plug.

- 1 - +12V DC (GRAY)
- 2 – GND (BLACK)
- 3 – Motor run / pulse (ORANGE)
- 4 – Empty (GREEN)

By the ND-300 Adapter it is possible to route PULSE signals to other devices, for example to charge smart cards or RFID cards.

## 5.4 LCD-Adapter



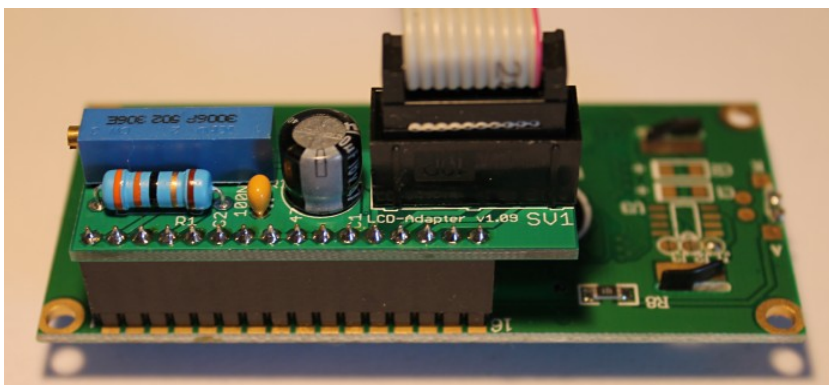
Depends on the used LCD display, the adapter has to be mounted on the left or right side. Some displays have the power pins on the left side others on the right side! Hint: since version 1.10 the LCD-Adapter only

## 5.5 Pin out LCD-Adapter

Pin1 = LED L-	Pin10 = DB1
Pin2 = LED L+	Pin11 = DB2
Pin3 = VSS (GND)	Pin12 = DB3
Pin4 = VDD (+5V)	Pin13 = DB4
Pin5 = V Contrast	Pin14 = DB5
Pin6 = RS	Pin15 = DB6
Pin7 = R/W	Pin16 = DB7
Pin8 = E	Pin17 = LED L+ (since v1.10 this does not not longer exists)
Pin9 = DB0	Pin18 = LED L- (since v1.10 this does not not longer exists)

With the CASH-Interface MC8 the LCD-Display is controlled in 4Bit mode. The contrast is adjustable via the spindle pots. Newer OLED displays do not need contrast adjustments anymore.

## 5.6 LCD-Adapter position for DISPLAYTECH 162C



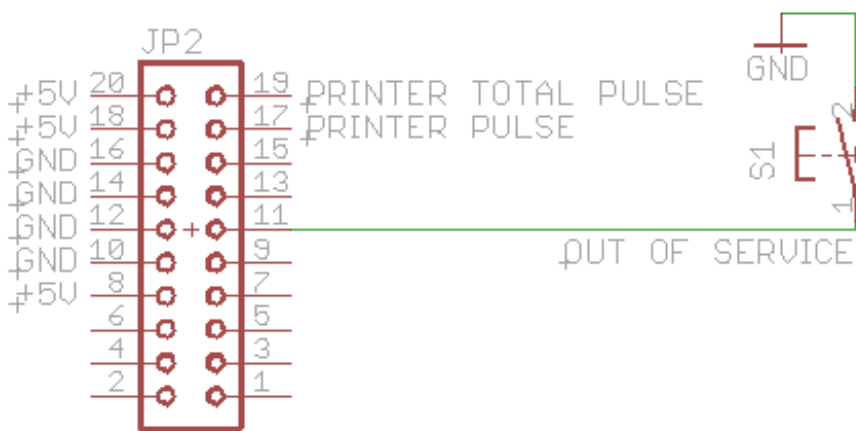
**The manufacturer of the LCD display suggests to NOT use flat ribbon cables longer than 10cm to avoid display problems by interfering signals! If you use longer cables and get problems change to a shorter cable length.**

### 5.7 Standard mode

In default mode the C6 and C7 outputs are PULSE outputs for the printer.

With A5 input it is possible to set the machine to “OUT OF SERVICE” state, that means “OUT OF SERVICE” is shown in the display and acceptance of cash is disabled. For example this is interesting in the car wash sector to disable the machine thru the night by a timer.

The A5 input is used also to restart the payout job after a hopper empty error.



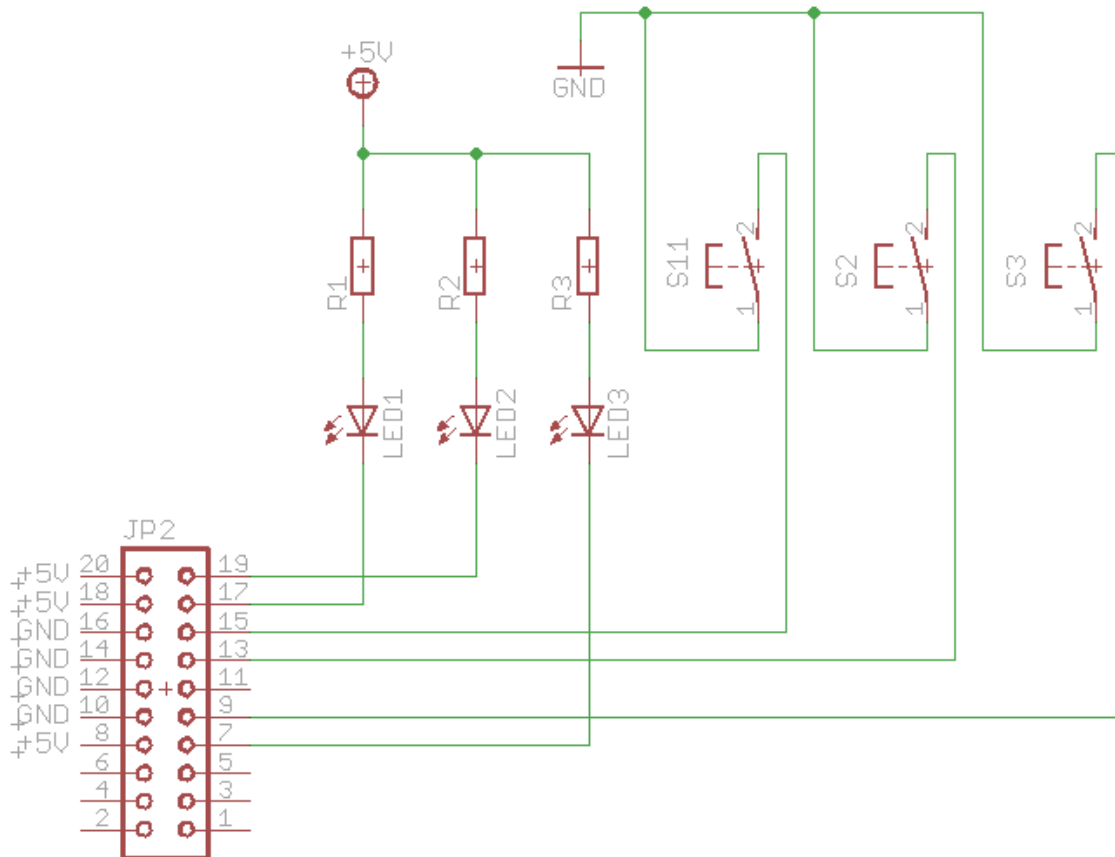
### 5.8 User select mode

Push button connection:

S1 = push button pay out hopper 1 (e.g. 0,50 Euro coin), LED1 = illumination push button 1

S2 = push button pay out hopper 2 (e.g. 1 Euro coin), LED2 = illumination push button 2

S3 = push button pay out hopper 3 (e.g. 2 Euro coin), LED3 = illumination push button 3



To illuminate the buttons there should be LEDs used because they need less current. Every output can supply 40mA, for higher current use an external relays. If you use a relays, be sure to add a freewheeling diode to the relays coil, or the output on the CI MC8 gets destroyed!

## 6. GETTING STARTED

To make the settings, the service menu is called via the SERVICE button. Press the SERVICE button to navigate to the next menu item. First set up the coin and bill acceptor values. For COIN #1 set the value for the first coin, e.g. 10 for 10 Cent. Then for COIN #2 set the value for the second coin, e.g. 20 for 20 Cent, and so on. Same for the banknotes, for BILL #1 set the value for the first banknote, e.g. 500 for 5 Euro. For BILL #2 set the value for the second banknote, e.g. 1000 for 10 Euro, and so on.

Next set the communication protocol for the coin validator (COIN) and bill validator (BILL). Hint: using more than 3 coins or banknotes BINARY protocol must be used. Using BINARY protocol, of course the validator device must be set to BINARY, too!

Now set the value for the hopper1-3. The smallest coin value must be placed in hopper 1, the biggest coin value in hopper 3. This way the control can calculate by itself how many coins should be paid from what hopper, starting with the biggest coin. If there are settings for BILL1-7 + HOPPER1-3 the control does not calculate the number of coins.

Next important setting is the hopper empty detection for hopper 1-3 (H1-EMPTY, H2-EMPTY, H3-EMPTY). It is recommended to activate the hopper empty detection.

For the very first test run connect coin and bill validator, as well as fully filled hoppers, and test several different banknotes.

In the service menu the sum of all pay ins is shown on the TOTAL IN entry. There is also a pay out counter for every hopper.

## 7. OTHER

Using the coin validator with PARALLEL protocol only line 1-3 can be evaluated due to insufficient inputs on the micro controller and because the hoppers are connected to the upper coin lines.

With more than 3 coins the coin validator should be used with BINARY protocol. This way with the 3 output lines #1-#3 it is possible to detect 7 different coins.

For EUR 1 and EUR 2 coin it is possible to adjust the coins number for each hopper. With a 1 or 2 EUR coin in the payout is done immediately according settings.

Using the same coins value the payout is done alternately via hopper1, hopper2 and hopper3. Settings for hopper1 is used for all hoppers. Example: hopper1=50 cent, hopper2=50 cent, setting BILL1-HOPPER1=10 (5 Euro gives 10x 50 cent). Payout is 10x 50 cent from hopper1, or 10x 50 cent from hopper2 alternately. This way the capacity for one coin or token can be increased by filling the same coin to max. 3 hopper.

## **8. SAFETY INSTRUCTIONS**

Read the user manual completely and carefully before use. The user manual is part of the product and contains important information for correct use.

Use the product, product parts and accessories only in perfect condition. Compare the specifications of all used devices to ensure compatibility. In case of questions, defects, mechanical damage, trouble and other problems, non-recoverable by the documentation, contact your dealer or producer.

The CASH-Interface MC8 module is intended to use in a housing.

Only use the CASH-Interface MC8 module in low-voltage circuits (max. 24V). Higher voltage rates are not permissible. There is danger to life through an electric shock and a risk of fire!

Ensure that all the electrical connections and connection cables conform to the regulations.

The entire product may not be modified or reassembled. Operation is only permissible in dry indoor locations. Never operate the device immediately after bringing it from a cold to a warm room. The resulting condensation water may damage the device. Do not expose the 8 channel digital IN/OUT module to high temperatures, strong vibrations, high degrees of humidity or chemically aggressive dusts, gases and vapors.

Electronic components of the 8 channel digital IN/OUT module may heat up during operation. Ensure sufficient air circulation around the device to prevent heat build-up and overheating.

In case of damage incurred by disregarding these operating instructions, the warranty claim is void. Liability for any and all consequential damage is excluded! We do not assume any liability for damage to property or personal injury caused by improper use or the failure to observe the safety instructions!

## **9. DISPOSAL INSTRUCTIONS**

According to the European WEEE directive, electrical and electronic equipment must not be disposed with consumers waste. Its components must be recycled or disposed apart from each other. Otherwise contaminative and hazardous substances can pollute our environment.

## **10. LIABILITY NOTICE**

We reserve the right to printing errors and changes to product, packaging or product documentation. See our term of warranty.