

CASH-Interface MC8 [CHANGER LITE EDITION]

User manual

Board version: v1.03

Software version: v1.10

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1. DESCRIPTION

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

Connection options for bill validator, coin validator, 1x hopper (or ticket or note dispenser), and a 16x2 LCD display. 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.

In default mode the corresponding amount of coins is paid out directly. The amount is reduced and shown on the display by every paid coin. Using 1 hopper there can be paid out 1 coin type. In the service menu the amount of coins for hopper 1 can be adjusted for every bill separately.

The hopper is monitored for EMPTY, that means if the hopper is empty the acceptance of money is disabled and shown in the LCD display.

2. SERVICE MENU

The SERVICE menu is activated via the SERVICE button on the board. 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). 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.

If there are credits left on leaving the service menu, e.g. after a hopper empty while payout, the pay out will start again.

2.1 Menu items

Currently the SERVICE menu contains 40 menu items.

- 1: SOFTWARE and VERSION
shows the software and version number, e.g. CI MC8 CHANGER, VERSION: 2.03
- 2: CREDIT
displays the current balance, e.g. 10.00
- 3: TOTAL – IN
shows how much money was totally inserted (cash register counter)
- 4: 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.
- 5: HOPPER1 PAYOUT 20 COINS
pays out 20 coins from hopper1, for example to empty the hopper
- 6: EXIT - CLOSE SERVICE
exits the SERVICE-MENU and saves all settings.
- 7: BILL1 - HOPPER1, Setting range 0-1000, default setting 0
On accept bill1, number of coins to pay via hopper1
- 8: BILL2 - HOPPER1, Setting range 0-1000, default setting 0
On accept bill2, number of coins to pay via hopper1
- 9: BILL3 - HOPPER1, Setting range 0-1000, default setting 0
On accept bill3, number of coins to pay via hopper1
- 10: BILL4 - HOPPER1, Setting range 0-1000, default setting 0
On accept bill4, number of coins to pay via hopper1
- 11: BILL5 - HOPPER1, Setting range 0-1000, default setting 0
On accept bill5, number of coins to pay via hopper1
- 12: BILL6 - HOPPER1, Setting range 0-1000, default setting 0
On accept bill6, number of coins to pay via hopper1
- 13: BILL7 - HOPPER1, Setting range 0-1000, default setting 0
On accept bill7, number of coins to pay via hopper1
- 14: COIN #1, Setting range 0-50000, default setting 50 (0,50 EUR)
value for coin channel 1.
- 15: COIN #2, Setting range 0-50000, default setting 100 (1 EUR)
value for coin channel 2.
- 16: COIN #3, Setting range 0-50000, default setting 200 (2 EUR)
value for coin channel 3.
- 17: COIN #4, Setting range 0-50000, default setting 0
value for coin channel 4. Hint: needs to use BINARY protocol
- 18: COIN #5, Setting range 0-50000, default setting 0
value for coin channel 5. Hint: needs to use BINARY protocol
- 19: COIN #6, Setting range 0-50000, default setting 0
value for coin channel 6. Hint: needs to use BINARY protocol
- 20: COIN #7, Setting range 0-50000, default setting 0
value for coin channel 7. Hint: needs to use BINARY protocol
- 21: BILL #1, Setting range 0-50000, default setting 500 (5 EUR)

- value for bill channel 1.
- 22: BILL #2, Setting range 0-50000, default setting 1000 (10 EUR)
value for bill channel 2.
- 23: BILL #3, Setting range 0-50000, default setting 2000 (20 EUR)
value for bill channel 3.
- 24: BILL #4, Setting range 0-50000, default setting 5000 (50 EUR)
value for bill channel 4.
- 25: BILL #5, Setting range 0-50000, default setting 0
value for bill channel 5. Hint: needs to use BINARY protocol
- 26: BILL #6, Setting range 0-50000, default setting 0
value for bill channel 6. Hint: needs to use BINARY protocol
- 27: BILL #7, Setting range 0-50000, default setting 0
value for bill channel 7. Hint: needs to use BINARY protocol
- 28: COIN PROTOCOL, PARALLEL or BINARY, default setting PARALLEL
coin validator transmission protocol. More than 3 coins needs to use BINARY protocol
- 29: BILL PROTOCOL, PARALLEL or BINARY, default setting PARALLEL
bill validator transmission protocol. More than 4 bills needs to use BINARY protocol
- 30: COMMA, OFF or ON, default setting ON
OFF=show credits without comma, ON=show credits with comma
- 31: HOPPER1 VALUE, Setting range 1-50000, default setting 100 (1 Euro)
value for hopper1 coin
- 32: C-SIG, HIGH or LOW, default setting LOW
Coin Signal, e.g. Asahi Seiko needs „HIGH“, CUBE MKII needs „LOW“.
- 33: H-EMPTY, OFF or ON, default setting ON
hopper1 empty detection, ALWAYS or only OnStart + OnMenuExit + OnAfterPayout
- 34: PULSE2BILL, OFF or ON, default setting ON
Credits are accumulated and assignments for BILL1-7 + H1-3 are used.
- 35: DELAY VALUE, Setting range 1-10, default setting 1
delay in seconds until payout job starts.
Needed if small coins are inserted
- 36: ACCEPT – MAXCREDIT, Setting range 0-50000, default setting 50000
If MAXCREDIT is reached cash acceptance is disabled.
- 37: LINGO, ENGLISH or DEUTSCH or HUNGARIAN, default setting ENGLISH
customer language used in the LCD display. Menu language is always english
- 38: SHOW, READY or CHANGER READY, default setting CHANGER READY
display on standby, READY or CHANGER READY.
- 39: SHOW - COIN COUNT
Shows the number of coins currently paid out on display line 1
- 40: 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: 4 coins possible (#1 - #4)

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 - #3 BINARY CODED)

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

There can be 20 coins paid for hopper1, e.g. this is useful to empty the hopper.

“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.

3. DEVICES

3.1 Bill validator

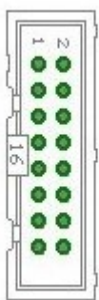
Of the type NV9, NV10 or pin compatible.

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 BILL#1 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)

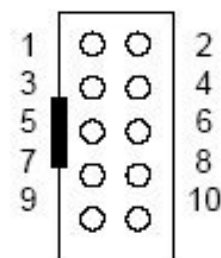
3.2 Coin validator

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



3.3 Hopper

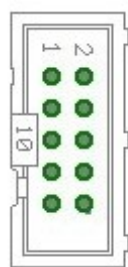
Hopper of the type Azkoyen U-II, Flow-Hopper, Hopper HS-2012 (STD) via MK4 adapter, MK2/3/4 via MK4 adapter, Note dispenser ND300KM via ND300KM adapter, CUBE HOPPER MK2 with driver cable and ND300-Adapter.

It is possible to control ALL hoppers via “LOGIC CONTROL”, for example Asahi Seiko WH3, CUBE HOPPER MKII (with driver cable), EXCEL hopper via CUBE HOPPER MKII adapter, means virtually any hopper that supports standard hopper mode (LOGIC CONTROL).

If there is no hopper connected, you will get a "HOPPER EMPTY!, OUT OF SERVICE" message in the display, because we get no coins present signal from the hopper. You can connect GROUND to hopper plug pin10 to simulate COINS ARE PRESENT => means HOPPER IS NOT EMPTY.

Protocol: LOGIC CONTROL

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 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 START input, or the START button on the CI MC8 board, after the fill up job is finished.

Example to use LOGIC CONTROL with a MK4 hopper:

1. On the MK4-Adapter: change Jumpers to select MODE1 - LOGIC CONTROL
 => Mode 1 (Logic control / motor run) : JP1.3 closed + JP1.4 closed

There is one more thing you can select on the MK4 adapter:
 you can select to use coin signal RAW or coin signal μ C.

JP2.1 : Coin (μ P Sensor Output) => short JP2.1 to JP2.2

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

3.4 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. We suggest to use a shielded cable for the display to avoid display problems. Current OLED displays are preferable older LCD displays.

3.5 Cashless systems

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

[Nayax cashless payments vpos](#)

[Otipulse cashless payment systems](#)

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

[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. You can also find suitable devices in our [web-shop](#).

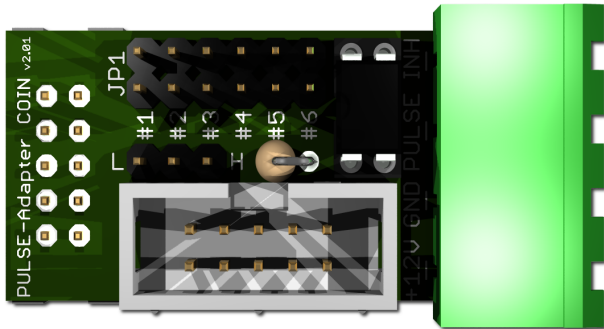
The above listed devices can be connected without any problems to the CI MC8 board. The device must work with PULSE Interface. Further information on the wiring of the corresponding system can be obtained from us on request.

We have made a PDF file that describes the connection of Nayax cashless systems:

[Nayax Connection](#)

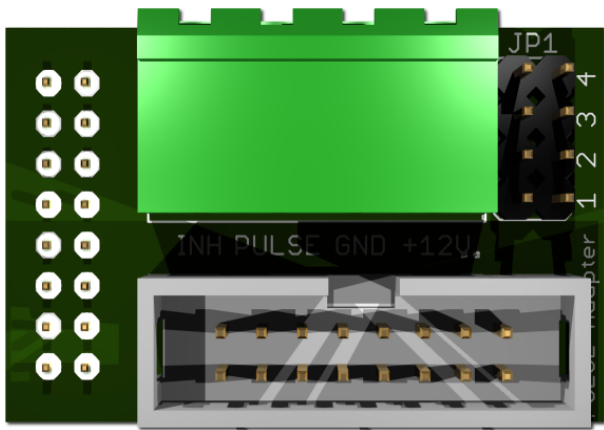
3.6 PULSE-Adapter

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

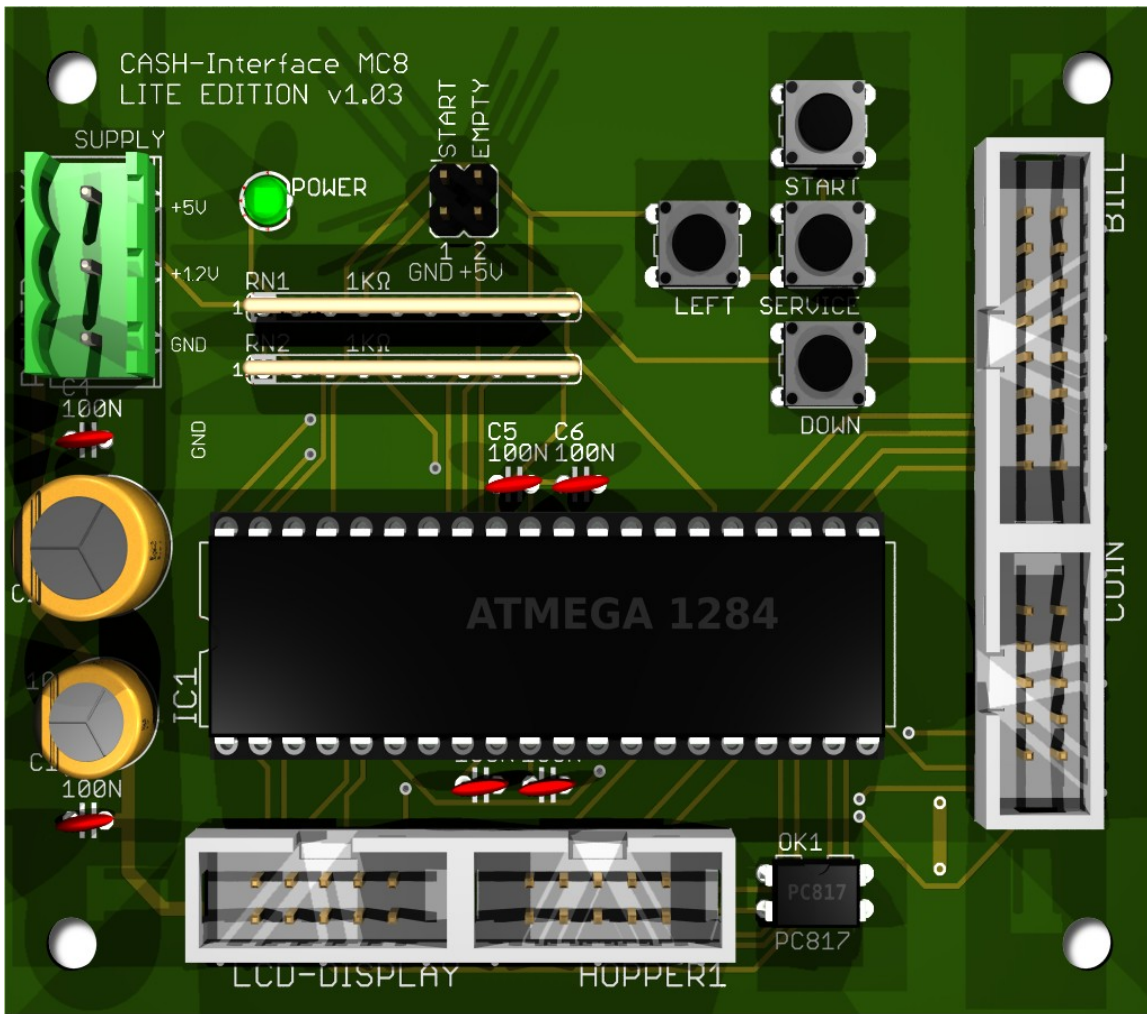
an INHIBIT out, to control the acceptance of the Nayax device.



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 LITE EDITION BOARD



4.1 Jumper

JP1.1 - START button, Pin1=GND, Pin2=C4
 JP1.2 - EMPTY signal, Pin3=+5V, Pin4=A7 (GND)

START button
 Hopper Empty signal

4.2 Micro controller

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

Port A.0 - Hopper1 COIN signal, signal=LOW

Port A.1 - Hopper1 Empty, not empty=LOW

Port A.2 -

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

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

Port A.5 -

Port A.6 -

Port A.7 - ERROR (H-EMPTY) 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 - Coin #4, Active LOW

Port B.4 - Hopper1 RUN

Port B.5 -

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

Port B.7 -

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 -

Port C.7 -

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

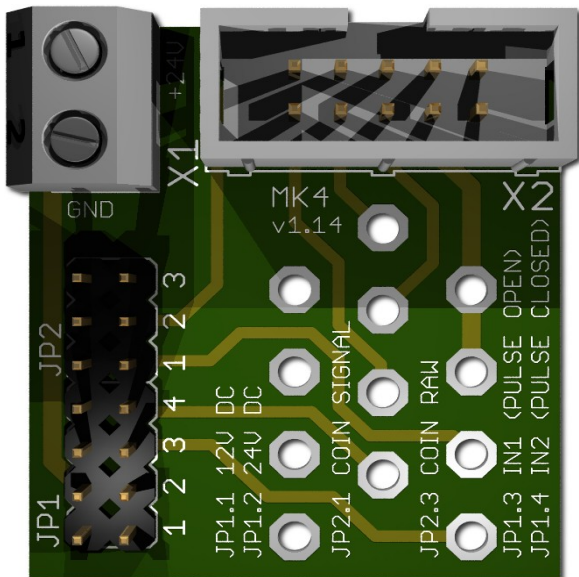
5.1 Power supply



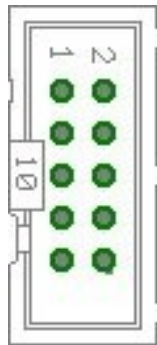
The power supply is connected to terminal plug X1.

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

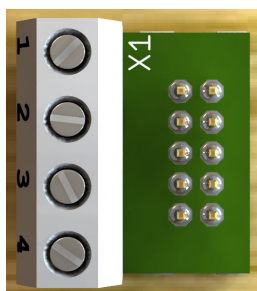
Mode 1 (Logic control / motor run) : JP1.3 closed + JP1.4 closed

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

JP2.1 : Coin (μ 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.

Usage:	ND-300	CUBE HOPPER MKII
1 = +12V DC	GRAY	RED
2 = GND	BLACK	BLACK
3 = Motor	ORANGE	WHITE (RUN)
4 = Empty	GREEN	ORANGE (COIN)

The ND300 adapter can also be used to connect hoppers, which do not have a 10 pin ribbon cable connection, with the 10 pin. Hopper connector on the CI MC8 board.

Via ND300-Adapter the PULSE signals can be also redirected to other devices, for example to "charge" smartcards or RFID cards.

CUBE HOPPER MKII:

Connecting a CUBE HOPPER MKII hopper, the original for the hopper available „driver cable“ is needed:



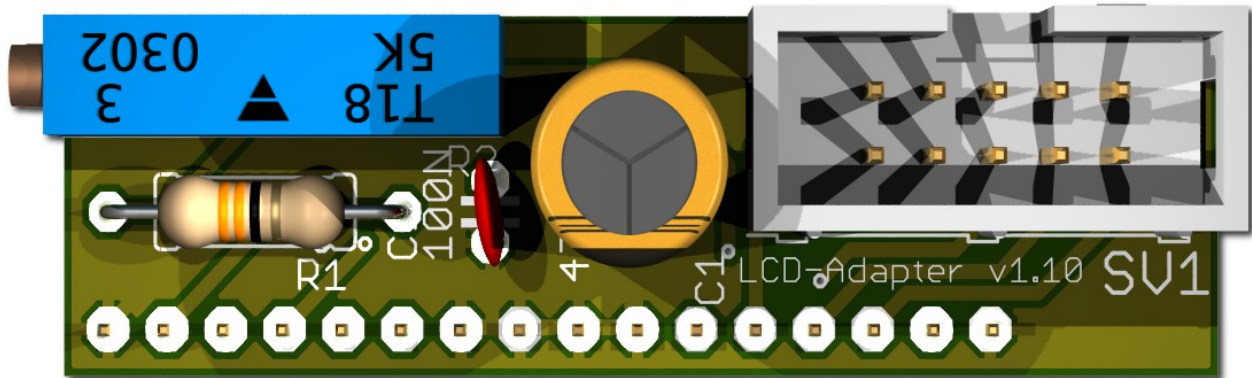
DRIVER CABLE

CUBE HOPPER MKII

GREY	Pin 1	low level
PURPLE	Pin 2	low level (common).
-	Pin 3	pin cut out, optional lock.
GREEN	Pin 4	continuous monitored optic control, power +12 / +24VDC.
YELLOW	Pin 5	Reserved
ORANGE*	Pin 6	optic-sensor signal: coin out
-	Pin 7	+24VDC supply and motor control.
RED*	Pin 8	+12VDC supply and motor control.
BLACK*	Pin 9	Ground common supply.
WHITE*		motor run

Hint: With the CI MC8 LITE edition it is not possible to use a ND300-Adapter to connect a CUBE MK2 hopper. If you need to use CUBE MK2 hopper, you have to wire the driver cable wires directly by dupont cables to the hopper1 plug. Pinout of the hopper plug see 3.3 The wires marked with * are needed.

5.4 LCD-Adapter



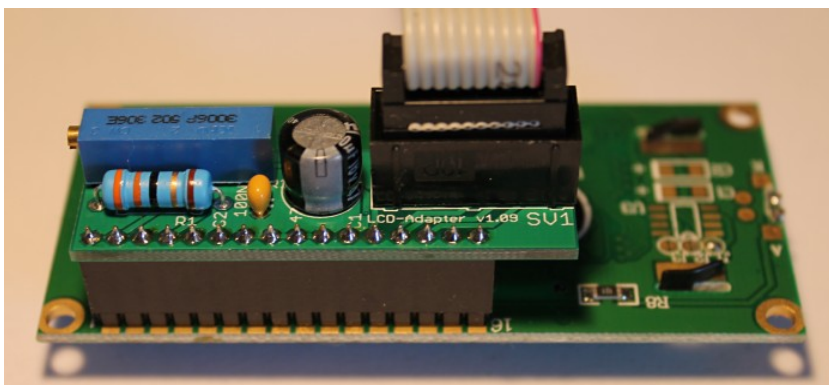
Depends on the used LCD display, the adapter has to be mounted on the left or right side. Some displays have the power pins on the left side others on the right side! Hint: since version 1.10 the LCD-Adapter only

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 or use an shielded cable.

5.7 Shielded LCD-Cable

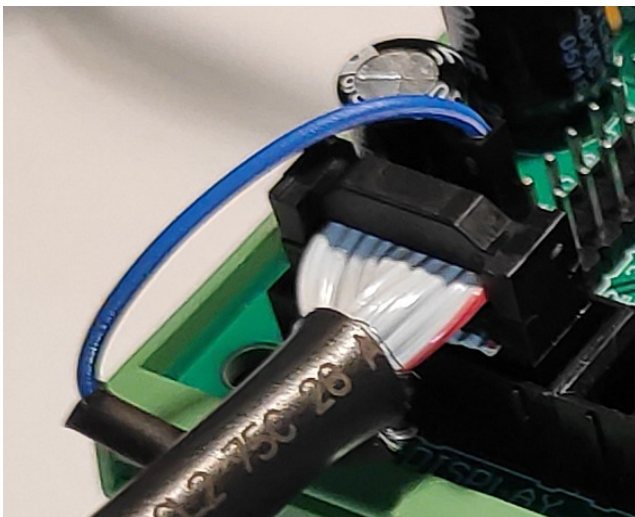
In environments with strong interfering signals, e.g. generated by motors or solenoid valves, faults in the view of the LCD or OLED display may occur!



The display shows then weird characters (hieroglyphics).

This can be remedied by usage of a shielded cable that blocks the interference signals.

We recommend the use of a shielded cable for the LCD or OLED display, to avoid problems with the display.



For the grounding of the cable shielding, the shielding is carried out on one side with a single dupont cable with an female connector, and can therefore simply be plugged onto GROUND (JP2 - GND) on the CI MC8 circuit board.

In addition, we offer Y-cables, this enables the connection of 2 displays to one LCD connector, e.g. one display on the outside visible for the customer, and a second display on the inside of the machine for SERVICE purpose.

We offer shielded flat ribbon cable, as well as Y-cables as accessories in the web shop at www.casino-software.de/shop

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 4 coins or 4 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, this way the control can calculate by itself how many coins should be paid from the hopper. If there are settings for BILL1-7 + HOPPER1 the control does not calculate the number of coins.

Next important setting is the hopper empty detection for hopper 1. It is recommended to set the hopper empty detection to ALWAYS: ON.

For the very first test run connect coin and bill validator, as well as fully filled hopper, 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 the hopper.

7. OTHER

Using the coin validator with PARALLEL protocol only line 1-4 can be evaluated. With more than 4 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.

8. INSTALLATION IN THE CABINET

The CI MC8 board is simply clamped on a DIN rail pcb holder and wired. The display is installed accordingly, maybe with its own adapter, in the cabinet's front:



9. 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 CASH-Interface MC8 module to high temperatures, strong vibrations, high degrees of humidity or chemically aggressive dusts, gases and vapors.

Electronic components of the CASH-Interface MC8 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!

10. 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.

11. LIABILITY NOTICE

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