2019

MDB Master Board rev2 User Manual

ENGLISH VERSION

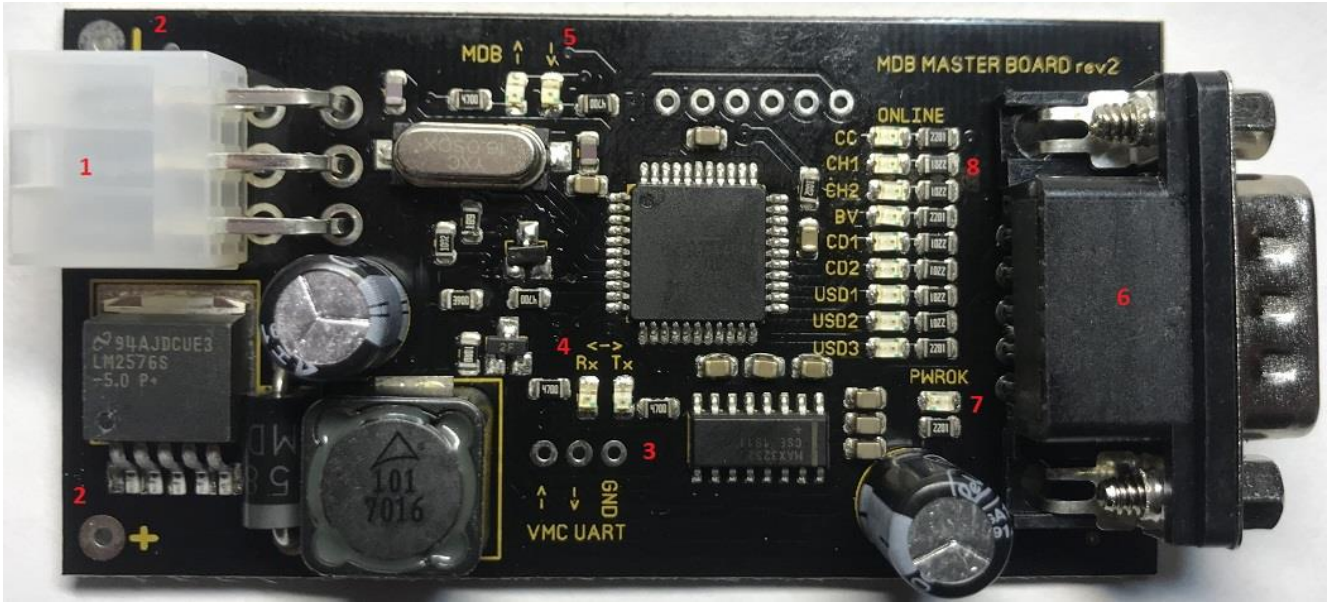
MDBSTUFF TEAM | https://www.mdbstuff.com

Product information

Description

The adapter is designed to control MDB-enabled devices for receiving and dispensing cash. MDB 4.2 protocol supported; 4 devices can operate at the same time: a coin acceptor (with the possibility of dispensing coins or without), a bill acceptor (with the possibility of dispensing notes or without), a coin dispenser - 2 pcs.

Appearance and connectivity



1 – MDB Master connector for peripherals

2 – input from a 24-36V DC power supply, in accordance with the characteristics of peripheral devices

3 – UART 5V TTL. Control unit connection option (VMC)

4 – LED indicators for data exchange with the control unit (VMC)

5 – LED indicators for data exchange with the MDB

6 – RS-232 connector. Control unit connection option (VMC)

7 – 5V LED

8 – LED indicators for peripheral devices presented on the MDB bus.

Designations: CC = coin acceptor; BV = bill acceptor; CH1, CH2 = coin dispenser; CD1, CD2 = cashless payment terminals (or devices emulating them); USD1, USD2, USD3 = devices for the delivery of piece goods.

Specifications

Parameter	Value	Note
Input voltage and current consumption	12-48VDC, 300mA max	MDB PSU used. The specific voltage value depends on the needs of the peripherals.
Device support	Coin acceptor Bill acceptor Coin dispenser (up to 2 pcs.)	Devices are connected to the bus in parallel. The MDB standard provides for simultaneous operation with all supported devices.
Communication speed with the control device via UART / RS-232 (serial port settings)	9600-8-N-1	
Ambient temperature range	-20 … +40 °C	
MTBF	100000hrs	

Getting started

Power

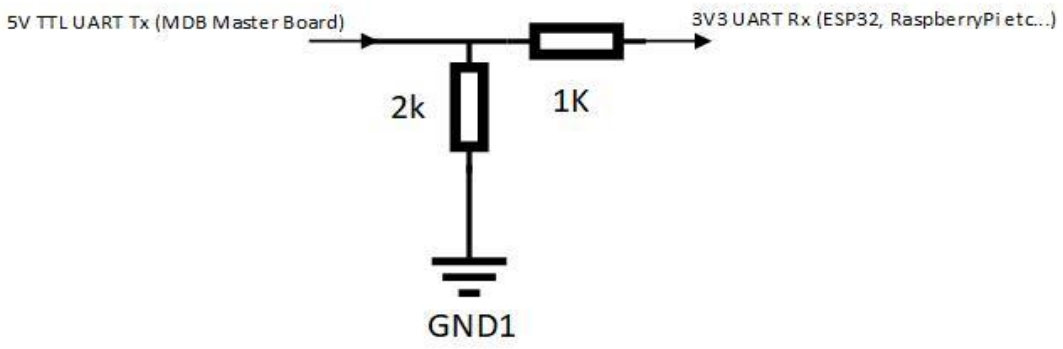
When integrating into an existing system (modernization), the device can use the MDB bus as a power source, on which the supply voltage of peripheral devices must be present within 24-36V DC. This way MDB Master connector used.

When designing new systems, it is recommended to supply voltage from the power source directly to the adapter board, from where it will be supplied to peripheral devices via the MDB Master connector.

Control Unit Connection (VMC)

VMC - Vending machine controller, a vending machine controller that implements business logic. When using a full-sized personal computer as a VMC, RS-232 connector used (item 6) with null-modem DB9F-DB9F cable (purchased separately). If there is no RS-232 connector on the control computer, UART interface used (item 3); it is possible to connect via the FT232-based USB-UART serial port emulator. Be careful when purchasing these adapters, a price of less than 5 USD most often means a fake FT232 chip.

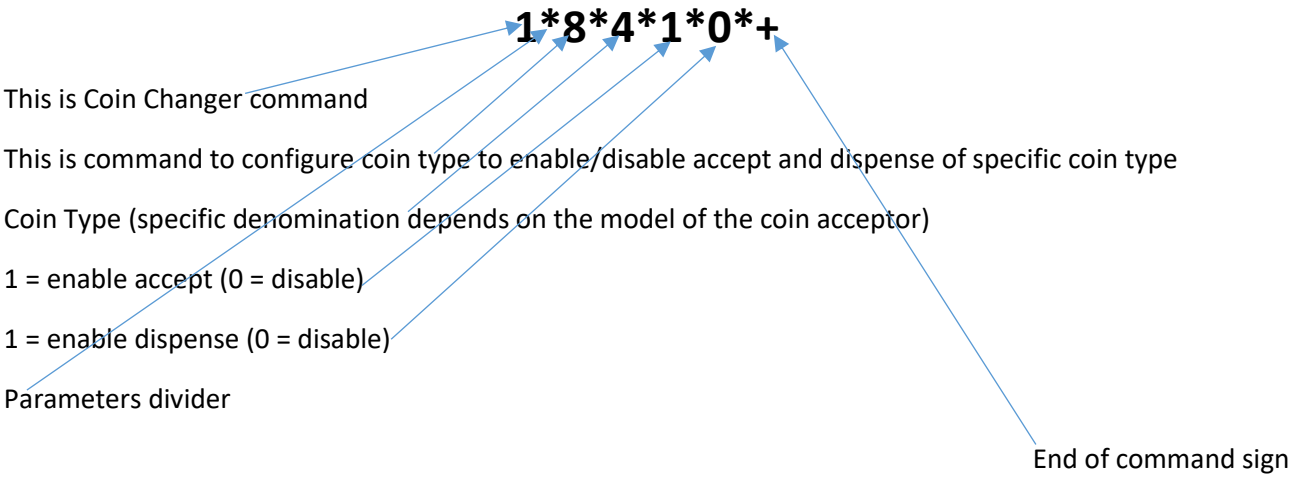
ATTENTION: when using UART, do not directly connect control devices such as Raspberry Pi 3, esp32 and others that work with 3.3V logic levels! Carefully read the VMC documentation and make sure that the control device supports 5V TTL UART levels, otherwise you risk burning out the VMC RX contact, which is not tolerated for overvoltage. Use a voltage divider in such cases. Do not worry about reverse data flow and voltage tolerance, as 5V UART will transparently work with 3V3 levels.



Data Exchange

Sending commands

The device receives commands from the control computer via the serial port as ASCII text strings. Each command consists of a set of numerical parameters separated by a “*” symbol (asterisk), and ends with a “+” symbol (plus sign). Command example:



Coin Changer commands

Reset

1*1*+

This command is the vehicle that the VMC should use to tell the changer that it should return to its default operating mode. With the exception of the ACK response, it should abort all communication and disable all acceptance until otherwise instructed by the VMC.

Identification

1*2*+

Changer enable

1*3*+

The acceptance and issue of coins will be activated, in accordance with the settings for each coin type (see “Configuring a coin of a certain type”)

Changer disable

1*4*+

disables all acceptance until otherwise instructed by the VMC

Dispense coins

1*5*X*Y*+

X = [1-16] – coin type; Y = [1-15] – coins quantity

Dispense value

1*6*X*+

X = [1-255] – the number of minimum values to issue

This value is expressed as the number of X*minimum values. The coin changer will determine which actual denominations of coins will be paid out.

Configuring a coin of a certain type

1*8*X*Y*Z*+

X = [1-16] – Coin type; Y = [0, 1] – enable or disable accept, Z = [0, 1] – enable or disable manual dispense. The settings are saved in the non-volatile memory of the adapter and are applied during the next command "Changer enable".

Configure Changer features

1*9*X*Y*Z*+

X = [0, 1] – enable or disable value dispense; Y = [0, 1] –enable or disable extended diagnostic, Z = [0, 1] – enable or disable manual fill and payout. The settings are saved in the non-volatile memory of the adapter and are applied immediately.

Bill Validator / Bill Acceptor / Bill Recycler commands

Reset

2*1*+

This command is the vehicle that the VMC should use to tell the validator that it should return to its default operating mode. It should reject any bills in the validation process, return any bills in the escrow position, and disable all other activity until otherwise instructed by the VMC.

Идентификация

2*2*+

Operating mode enable

2*3*+

The acceptance and issue of bills will be activated, in accordance with the settings for each bill type (see "Configuring a bill of a certain type")

Operating mode disable

2*4*+

Bills acceptance and dispensing will be disabled until otherwise instructed by the VMC.

Escrow bill action

2*5*X*+

X = [0, 1] – 0 = return bill, 1=accept bill.

Dispense bills

2*6*X*Y*+

X = [1-16] – bill type; Y = [1-65535] – bills quantity

Dispense value

2*7*X*+

X = [1-65535] – the number of minimum values to issue

This value is expressed as the number of X*minimum values. Validator will determine which actual denominations of bills will be paid out.

Configuring a certain type of bill

2*8*X*Y*Z*A*B*+

X = [1-16] – bill type; Y = [0, 1] – disable or enable acceptance, Z = [0, 1] – disable or enable Escrow feature, A = [0, 1] – disable or enable dispensing, B = [0, 1] – disable or enable manual dispensing. The settings are saved in the non-volatile memory of the adapter and are applied when "Operating mode enable" command issued.

Configure validator features

2*9*X*+

X = [0, 1] – disable or enable bill recycling feature. The settings are saved in the non-volatile memory of the adapter and are applied when "Operating mode enable" command issued.

Cancel current payout task

2*10*+

Coin Hopper / Tube Dispenser commands

Due to the fact that two devices of this type can be present on the bus simultaneously, the second parameter in the commands (X) indicates the target device, can take the values 1 or 2.

Reset

3*X*1*+

This command is the vehicle that the VMC should use to tell the dispenser that it should return to its default operating mode and initialize internal hardware systems. With the exception of the ACK response, it should abort all communication until otherwise instructed by the VMC.

Identification

3*X*2*+

Dispense coins

3*X*5*X*Y*+

X = [1-16] – coin type; Y = [1-65535] – coins quantity

Dispense value

3*X*6*Y*+

Y = [1-65535] – the number of minimum values to issue. Total value is expressed as the number of Y*minimum values. The coin changer will determine which actual denominations of coins will be paid out.

Enable or disable manual dispensing of certain coin type

3*X*8*Y*Z*+

Y = [1-16] – coin type; Z= [0, 1] – disable or enable manual dispensing. The settings are saved in the non-volatile memory of the adapter and are applied when Coin Hopper found on bus.

System commands

Reset All

0*0*+

Reset coin changer options

0*1*+

Reset bill validator options

0*2*+

Reset coin hopper options

0*3*+

Peripheral answers

The device sends data from the periphery to the host computer as ASCII strings (CRLF - ended), which list the received information, the separator is “*”. Answer example:

CC*ID*NRI*10115089-023*C2Pv0 1 455*300*1*1*1*1

CC – This data is from coin changer

ID – identification

NRI – код производителя

10115089-023 – Serial number

C2Pv0 1 455 – Model revision

300 – Software version

Value dispensing supported (0 = No, 1 = Yes)

Extended diagnostic supported (0 = No, 1 = Yes)

Manual fill and payout report supported (0 = No, 1 = Yes)

FTL supported (0 = No, 1 = Yes) – not actual as adapter does not supports FTL.

Coin Changer answers

CC*CFG*3*1643*0.50 – coin changer setup information:

3 – Changer Feature Level

1643 – If the left most digit is a 0, the International Telephone Code is used to indicate the country that the changer is set-up for; If the left most digit is a 1, the latest version of the ISO 4217 numeric currency code is used

0.50 – minimal coin value

CC*COINSUP*3*1.00*1*1 – supported coin type info:

3 – type

1.0 – value

Acceptance enabled (1) or disabled (0)

Dispensing enabled (1) or disabled (0)

CC*ID*NRI*10152866-024*C2Pv0 1 455*800*1*1*1*1 – see example above

CC*FEATENABLE*OK – settings applied successfully

CC*TUBE*5*5.00*13*0 – Tube status:

5 – coin type

5.00 – value

13 – coins left

0 – tube is full (0 – no, 1 - yes)

CC*DIAG*INHIBITED – extended diagnostic:

OK – OK

POWERUP

POWERDOWN

KEYPADSHIFTED

MANUALFILLPAY

NEWINVENTORY

INHIBITED

ERROR

CSERR1, CSERR2 – checksum errors

LOWVOLTAGE

DISCERR - discriminator error

DISCDECK - Flight deck open

DISCOPN – Escrow Return stuck open

DISCJAM – Coin jam in sensor.

DISCBLSTD - Discrimination below specified standard

DISCASENS – The acceptor detects a problem with sensor A.

DISCBSENS – The acceptor detects a problem with sensor B.

DISCCSENS – The acceptor detects a problem with sensor C.

DISCTMP – Operating temperature exceeded

DISCOPT – Sizing optics failure

GATERR - Non-specific accept gate error.

GATNX - Coins entered gate, but did not exit.

GATALM - Accept gate alarm active.

GATND - Accept gate open, but no coin detected.

GATSENS - Post gate sensor covered before gate opened.

SEPERR – Non-specific separator error

SEPSENS - Sort sensor error. The acceptor detects an error in the sorting sensor.

DISPERR – Non specific dispenser error.

CASERR – Non specific cassette error.

CASRMD – Cassette removed.

CASSENS - Cash box sensor error. The changer detects an error in a cash box sensor

CASLIT – Sunlight on tube sensors. The changer detects too much ambient light on one or more of the tube sensors.

CC*SLUG*2 – number of slugs since the last activity

CC*STATUS*ESCROWREQ – информация о статусе монетоприемника:

ESCROWREQ **–** An escrow lever activation has been detected

PAYOUTBUSY – The changer is busy activating payout devices.

NOCREDIT – coin was validated but did not get to the place in the system when credit is given.

BADTUBESENSOR – The changer has detected one of the tube sensors behaving abnormally

DOUBLECOIN – Two coins were detected too close together to validate either one

UNPLUGGED – The changer has detected that the acceptor has been removed

TUBEJAM – tube payout attempt has resulted in jammed condition

ROMERROR – The changers internal checksum does not match the calculated checksum

ROUTERROR – A coin has been validated, but did not follow the intended routing

BUSY – The changer is busy and can not answer a detailed command right now

JUSTRESET – The changer has detected an Reset condition and has returned to its power-on idle condition

COINJAM – A coin(s) has jammed in the acceptance path

FISHING – There has been an attempt to remove a credited coin

CC*MANUALDISP*4*2.00*1*1 – manual dispensed coins data

4 – coin type

2.00 – value

1 – coins dispensed

1 – coins left

CC*DEPOSIT*4*2.00*TUBE*1 – coin accepted

4 – type

2.00 – value

Route: TUBE, CASHBOX, REJECT, NA.

1 – coins left in tube

CC*COINCFG*4*2.00*1*1*OK – configuration of coin type success:

4 – type

2.00 – value

Enabled (1) or disabled (0) acceptance

Enabled (1) or disabled (0) dispensing

CC*ENABLE*OK – operating mode enabled success

CC*DISABLE*OK - operating mode disabled success

CC*DISPENSE*OK – dispense coins of certain type success

CC*DISP*FIN – dispense coins of certain type completed

CC*SUMPAYOUT*OK – dispense value success

CC*PAID*5.00 – value paid

CC*PAYOUTEND – value payout complete

CC*PAYSTATUS*5.00*1 – Payout status: coin value, coins dispensed quantity

CC*FEATCFG*OK – changer features configuration success

CC*MANUALFILL*5.00*2 – manual fill report

5.00 – value

2 – quantity filled

CC*MANUALPAYOUT*5.00*4 – manual payout report

5.00 – value

4 – quantity dispensed

Bill Validator / Bill Acceptor / Bill Recycler answers

BV*CFG*1*1810*10.00*2*200*1 – validator configuration info:

1 – Bill Validator Feature Level

1810 – If the left most digit is a 0, the International Telephone Code is used to indicate the country that the validator is set-up for. If the left most digit is a 1, the latest version of the ISO 4217 numeric currency code is used.

10.00 – minimal bill value

2 – Decimal Places

200 – Stacker Capacity

Supported (1) or not (0) Escrow capability.

BV*ID*ICT*000000000000*V7-RUR500000*123*0*0 – validator identification:

ICT – Manufacturer Code

000000000000 – serial number

V7-RUR500000 – model revision

123 – software version

Supported (1) or not (0) Bill Recycling capability.

Supported (1) or not (0) FTL capability.

BV*BILLSUP*1*10.00*0*1*0*0*0 – supported bills information:

1 – bill type

10.00 – value

Enabled (1) or disabled (0) Bill Recycling

Enabled (1) or disabled (0) acceptance

Enabled (1) or disabled (0) Escrow

Enabled (1) or disabled (0) Bill Recycling

Enabled (1) or disabled (0) manual dispensing

BV*STATUS*JUSTRESET – extended diagnostic:

JUSTRESET

BADMOTOR

BADSENSOR

BUSY

ROMERROR – checksum error

JAM – bill jammed

BILLREMOVED – A bill in the escrow position has been removed by an unknown means

CBOXOUT – The validator has detected the cash box to be open or removed

DISABLED

INVESCROW – An ESCROW command was requested for a bill not in the escrow position

REJECT – A bill was detected, but rejected because it could not be identified

FISHING – There has been an attempt to remove a credited (stacked) bill

BV*DISPSTATUS*ESCROWREQ – Bill dispenser status:

ESCROWREQ

PAYOUTBUSY

BUSY

BADMOTOR

BADSENSOR

JAM

ROMERROR – checksum error

DISABLED

BILLWAIT – waiting for customer removal

FILLEDKEY – Filled key pressed

BV*ATTEMPTS*2 – Number of attempts to input a bill while validator is disabled

BV*BILLACTION*4*500.00*STACKER – bill action:

4 – bill type

500.00 – value

STACKER – BILL STACKED

ESCROW – ESCROW POSITION

RETURN – BILL RETURNED

RECYCLER – BILL TO RECYCLER

DISREJECT – DISABLED BILL REJECTED (command description)

RECMANUAL – BILL TO RECYCLER – MANUAL FILL

DISPMANUAL – MANUAL DISPENSE

REC2CB – TRANSFERRED FROM RECYCLER TO CASHBOX

BV*FEATENABLE*OK – Bill Validator features enabled successfully

BV*RECYCLENABLE*OK – Bill Recycler activated. Bill type settings used.

BV*RECYCLEDISABLE*OK – Bill Recycler disabled

BV*DSTATUS*4*500.00*20*0 – Indicates status of dispenser for bill types

4 – bill type

500.00 – value

20 – quantity

0 – A bit is used to indicate a full dispenser

BV*DISPBILL*OK – Dispense bills of certain type OK

OK = OK

BILLWAIT = Bill waiting for customer removal

BV*DISPVALUE *OK – dispense value command OK

OK = OK

BILLWAIT = Bill waiting for customer removal

BV*DPS*4*500.00*10 – Number of bill type paid out

4 – bill type

500.00 – value

10 – quantity

BV*DPS*BUSY – Bill Recycler performing payout task

BV*DPV*5000.00 – Value dispensed

BV*DPVFIN – value dispensing completed

BV*ESC*OK – Escrow action result

BV*DPC*OK – Current payout cancelled

BV*STACKER*10*0 – The number of bills in the stacker

10 – bills number

0 – Indicates stacker full condition (1 if full)

BV*BILLCFG*4*500.00*1*1*1*1*OK – bill type configuration result

4 – bill type

500.00 – value

1 – enabled acceptance (0 - disable)

1 – enabled Escrow (0 - disable)

1 – enabled Recycling (0 - disable)

1 – enabled manual dispensing (0 - disable)

BV*ENABLE*OK

BV*DISABLE*OK

Coin Hopper answers

Due to the fact that two devices of this type can be present on the bus simultaneously, the first parameter in the commands indicates the target device, can take the values 1 or 2.

CH1*CFG*1*1810*1.00 – Hopper setup information:

1 – feature level

1810 – If the left most digit is a 0, the International Telephone Code is used to indicate the country that the validator is set-up for. If the left most digit is a 1, the latest version of the ISO 4217 numeric currency code is used.

1.00 – minimal coin value

CH1*FILL*5.00*15*0– coin count:

5.00 – value

15 – Coin Count

0 – A bit is set to indicate a full dispenser (1 if full)

CH1*DISPENSED*MANUAL*OK*5.00*2*22 – dispensed coins information:

MANUAL / AUTO – dispense mode

OK / FAIL – result

5.00 – value

2 – coin count

22 – coins left

CH1*STATUS*ESCROWREQ – dispenser status:

ESCROWREQ – An escrow lever activation has been detected

PAYOUTBUSY – The dispenser is busy activating payout devices

BADSENSOR – Defective Dispenser Sensor

NOSTART – Dispenser did not start

DISPJAM – A dispenser payout attempt has resulted in jammed condition

ROMERROR – checksum error

JUSTRESET – The dispenser has detected a Reset condition and has returned to its power-on idle condition

FILLEDKEY – Filled key pressed

CH1*COINCFG*2*2.00*1*OK – coin type configuration changed successfully:

2 – coin type

2.00 - value

manual dispensing enabled (1) or disabled (0)

CH1*DISPENSE*OK – Dispense coins result

CH1*SUMPAYOUT*OK – Dispense value result

CH1*PAYSTATUS*2*2.00*10 – coins dispensed:

2 – coin type

2.00 - value

10 – coin count dispensed

CH1*PAID*25.00 – value dispensed:

CH1*PAYOUTEND – value payout complete

CH1*ID*NRI*000000000000*111111111111*123*0 – Hopper identification data:

NRI – Manufacturer Code

000000000000 – serial number

111111111111 – model revision

123 – software version

FTL support: 1 = yes, 0 = no (not supported by adapter)

System messages

This chapter contains messages from adapter that are not part of MDB 4.2 specification

SYS*MDBSTART*1.2.3.4 – power up message, shows firmware version

SYS*VMCSET*READ*OK – settings read/write to non-volatile memory:

VMCSET – VMC settings

CCSET – coin changer settings

BVSET – bill validator settings

CHSET – coin hopper settings

SYS*DEVONLINE*BV – Device found

CC –coin changer

BV – bill validator

CH1, 2 – coin hopper

SYS*DEVLOST*BV – device not responding