Interface MDB master – RS232 v.06.09.2016 Quick reference

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I. General informations

1. Terms

- **INTERFACE** = the MDB-RS232 interface
- **HOST** = the computer or SBC board (Raspberry PI, Banana PI, etc.) that will send command to the INTERFACE using an RS232 serial port.
- **MDB PERIPHERALS** = payment systems connected on the MDB bus.
- **ACK** = acknowledge
- **NACK** = not-acknowledge

2. Working modes

The INTERFACE can be used in two modes: transparent mode and direct mode. The INTERFACE automatically changes the working mode, depending on the received commands..

A. Transparent mode

In transparent mode, there are simple commands to manage the MDB devices. The built-in firmware will handle MDB commands and it is the ideal mode where the developers don't need to learn any MDB command and response. Also there is no need to calculate the MDB checksum since this is automatically calculated by the INTERFACE and correctly sent to the MDB peripheral. When the INTERFACE will receive a transparent mode command, it automatically turn TRANSPARENT MODE ON and begin to continuously poll the MDB PERIPHERALS.

A proprietary simple message structure is available to communicate with bill validators and coin acceptors/changers. The general message format is detailed in table 1.

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
always 0xFE	1 byte	1 byte	variable length, depending on subcommand	1 byte

Table 1: Transparent mode message format

- **<HEADER>** – Is always a byte with a value of 0xFE.
- **<CMD>** - Defines the command group sent to the INTERFACE.
- **<SUBCMD>** - Defines the specific subcommand of the command group.
- **<PARAMETERS>** - Defines the command parameters that will be send to the MDB peripheral (for example, the maximum credit that the INTERFACE should accept or the change it should return from changer). Some commands are not requiring parameters. Also, the variable length depends on subcommand.
- **<CRC>** - Defines the message checksum. The <CRC> is calculated as an XOR of all message bytes, including the <HEADER>. For example, the command to enabled the bill validator is: 0xFE 0x42 0x02 and the CRC for this command is 0xBE. Transparent mode can be used for any application.
IMPORTANT!!! - If the host (computer) is not sending any valid command within 60 seconds, then the interface will disable all payment systems to avoid cashing money when the host is not working.

B. Direct mode

This mode is a low level mode that can be used by the experienced developers when they want to send MDB commands directly to the peripheral and they have to calculate the MDB checksum, also. The response from the addressed MDB peripheral is sent back to the HOST. The CRC is verified on the messages received from MDB peripheral. The INTERFACE will handle the 9th bit (mode bit) and will receive and send messages back to the HOST in 8 bit format. The INTERFACE will also check CRC on messages received from MDB PERIPHERALS and will acknowledge to the MDB bus. The acknowledge action is very time critical on MDB and must be achieved in a short interval (lower than 5ms). Otherwise, the MDB peripheral will get that as a not-acknowledge message.
If the INTERFACE receives a direct mode message, it will stop polling the MDB PERIPHERALS and automatically set the DIRECT MODE as a working mode.

C. High level protocol

This protocol is used with a small daemon, written with Python 3, the daemon you can download on product page at http://www.vendingtools.ro

3. Communication parameters

The INTERFACE can be connected to any RS232 port or any USB to RS232 port.
The communication settings should meet the following specifications:

Parameter	Value
baud	57600
data bits	8
parity	NONE
hardware flow	YES (RTS/CTS)
software flow	NO

Table 2: RS232 communication paramenters

II. Hardware overview
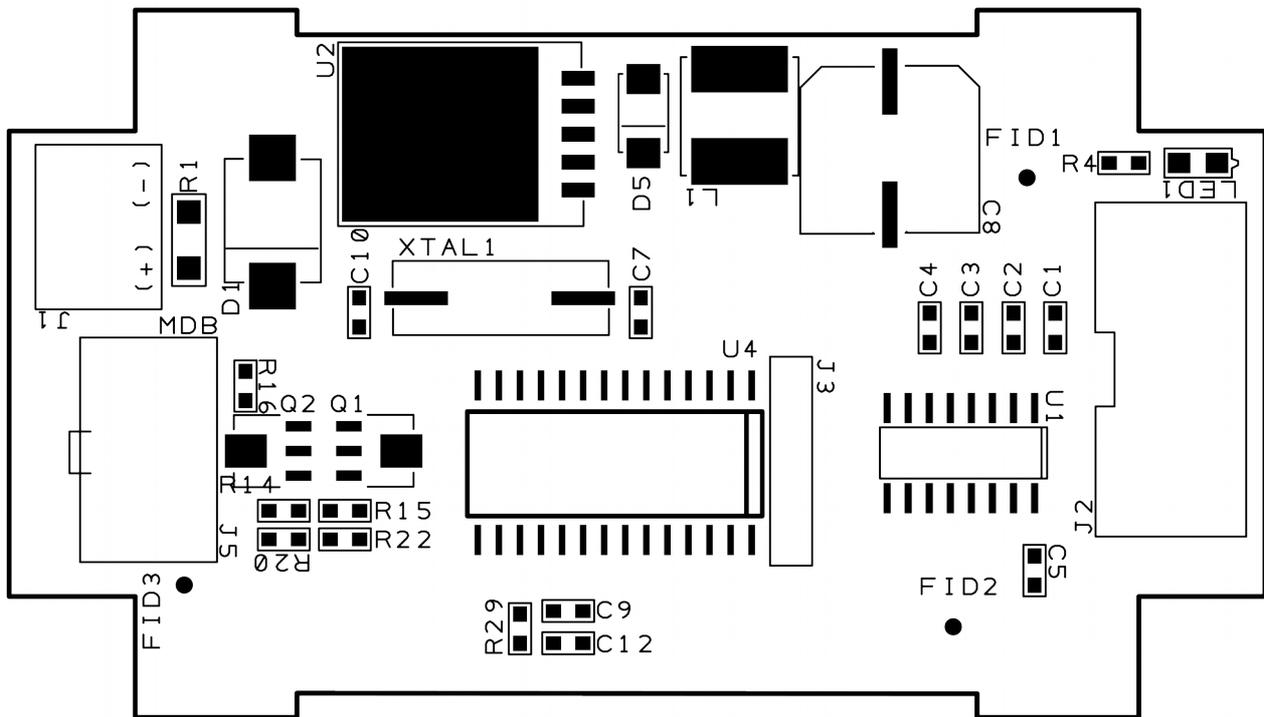
Picture 1: Board overview

1. Power supply requirements

The INTERFACE can be powered with stabilized 24VDC or 12VDC, depending on your MDB PERIPHERALS. You must use a stabilized DC power supply with at least 2A output. It is necessary to follow the correct polarity. In the eventuality of an accidental polarity reversal, the entire board and the MDB PERIPHERALS are protected, but will not work.

2. Connector description

- **<J1> –** POWER connector for the INTERFACE and MDB PERIPHERALS. Use only stabilized power supplies, with a voltage rating according to your MDB PERIPHERALS. Also, be careful at the current rating, since this may vary from one MDB peripheral to another. Use your MDB peripheral manual to identify the power needs.
- **<J2>** - RS232 connector. For this port, the package includes a flat cable with all necessary connectors.
- **<MDB>** - Used to connect the MDB PERIPHERALS.

You do not need to perform any settings on the INTERFACE, neither hardware or software.

III. Transparent mode protocol

Execution of any command in this chapter will turn the INTERFACE in transparent mode and will start the automatic MDB polling. The peripherals are polled continuously.

1. MDB bill validator initialization

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x42	0x01	[none]	0xBD
INTERFACE answer				
0xFE	0x42	0x01	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will execute the initialization procedure for the MDB bill validator connected on the MDB port.

2. MDB bill enable

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x42	0x02	[none]	0xBE
INTERFACE answer				
0xFE	0x42	0x02	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will enable the bill validator. This will accept all the banknotes he can recognize.

3. MDB bill disable

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x42	0x03	[none]	0xBF
INTERFACE answer				
0xFE	0x42	0x03	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will disable the bill validator. This will not accept any banknote.

4. MDB bill read setup vector

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x42	0x04	[none]	0xB8
INTERFACE answer				
0xFE	0x42	0x04	- <BILL SETUP> - 27 bytes - <BILL EXPANSION IDENTIFICATION> - 29 bytes	CRC

This command will return the settings vector for the MDB bill validator. Those vectors are read on the initialization phase. There are two vectors available and the contained data are detailed in the MDB documentation. This command is optional and is used only if you need to handle some lower informations (bill validator MDB level, software version, ISO country code, etc.).

5. Coin acceptor initialization

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x43	0x01	[none]	0xBC
INTERFACE answer				
0xFE	0x43	0x01	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will execute the initialization procedure for coin acceptor/changer connected on the MDB port.

6. Coin acceptor enable

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x43	0x02	[none]	0xBF
INTERFACE answer				
0xFE	0x43	0x02	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will activate the coin acceptor/changer. All recognized coins/tokens will be accepted and deposited.

7. Coin acceptor disable

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x43	0x03	[none]	0xBE
INTERFACE answer				
0xFE	0x43	0x03	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will deactivate the coin acceptor/changer.

8. Coin acceptor read setup vectors

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x43	0x04	[none]	0xB9
INTERFACE answer				
0xFE	0x43	0x04	- <COIN SETUP> - 23 bytes - <COIN EXPANSION IDENTIFICATION> - 33 bytes	CRC

This command will return the settings vector for the MDB coin acceptor/changer. Those vectors are read on the initialization phase. There are two vectors available and the contained data are detailed in the MDB documentation. This command is optional and is used only if you need to handle some lower informations (coin acceptor/changer MDB level, software version, ISO country code, etc.).

9. Set maximum credit

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x52	0x01	<MAXIMUM CREDIT> - 4 bytes – MSB Example: 0xFE 0x52 0x01 0x00 0x00 0x02 0x58 0xF7 – this will set the maximum credit to 600 units. In case of EUR or USD, this means 600 cents or 6.00EUR/6.00USD	CRC
INTERFACE answer				
0xFE	0x52	0x01	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will set the maximum acceptable credit for bills. Any bill exceeding this value will be rejected. For coins, you should disable the MDB coin acceptor after reaching the maximum credit value.

10. Reset the current credit

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x52	0x02	[none]	0xAE
INTERFACE answer				
0xFE	0x52	0x02	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

The INTERFACE has an internal cash counter which is incremented for each bill or coin deposited by the MDB PERIPHERALS. This counter can be read by using a POLL command, detailed on "12. Poll credit and devices status". For simplicity reasons, this counter can be reseted by this command. You can use this command after each transaction, or anytime you need.

11. Return change

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x52	0x03	<CHANGE TO RETURN> - 4 bytes – MSB Example: 0xFE 0x52 0x03 0x00 0x00 0x01 0x5E 0xF0 – this command will return 350 change, which means, for EUR and USD, 350cents or 3.50EUR/3.50USD	CRC
INTERFACE answer				
0xFE	0x52	0x03	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will start returning change if the interface has a changer connected on the MDB port.

12. Set current cash credit

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x52	0x04	<SET CURRENT CASH CREDIT> - 4 bytes – MSB Example: 0xFE 0x52 0x04 0x00 0x00 0x01 0x5E 0xF7 – this command will set current credit to 350, which means, for EUR and USD, 350cents or 3.50EUR/3.50USD – This is used to adjust credit in multivend mode and before the cashless revalue command to set only remaining credit for revalue.	CRC
INTERFACE answer				
0xFE	0x52	0x04	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will sest the current credit on the interface. It is indicated to use this command after every cash transaction finished with a successful vend.

13. Poll credit and devices status

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x50	0x01	[none]	0xAF
INTERFACE answer				
0xFE	0x50	0x01	- <CURRENT CREDIT CASH> - 4 bytes MSB (for example, 0x00 0x00 0x04 0xE2 representing 1250 cents or 12.50EUR/12.50USD) - <CURRENT CREDIT CASHLESS> - 4 bytes MSB (for example, 0x00 0x00 0x04 0xE2 representing 1250 cents or 12.50EUR/12.50USD) - <BILL validator status> - 4 byte, according to MDB bill validators status (see Table 3) – this register contains last 4 bill validator status. If the register has the value 0xFFFFFFFF, then the bill validator is not initialized. The rightmost byte of this register is the last status. - <COIN acceptor/changer status> - 4 bytes, according to MDB coin acceptors/changers status (see Table 4) - <CASHLESS #1 status> - 4 bytes, according to the MDB cashless status (see Table 5) - <CASHLESS #2 status> - 4 bytes, according to the MDB cashless status (see Table 5) - <CASHLESS MEDIA ID> - 4 bytes, card/tag serial number - <AVAILABLE CHANGE> - 4 bytes – the total value of the coins available in the coin changer. This value is updated on every coin enable or coin disable command	CRC

This command must be run periodically, at least one per second, to interrogate the payment systems status and to take all needed decisions.

Value	Description
0x00	Idle
0x01	Defective Motor - One of the motors has failed to perform its expected assignment.
0x02	Sensor Problem - One of the sensors has failed to provide its response.
0x03	Validator Busy - The validator is busy and can not answer a detailed command right now.
0x04	ROM Checksum Error - The validators internal checksum does not match the calculated checksum.
0x05	Validator Jammed - A bill(s) has jammed in the acceptance path.
0x06	Validator was reset - The validator has been reset since the last POLL.
0x07	Bill Removed - A bill in the escrow position has been removed by an unknown means. A BILL RETURNED message should also be sent.
0x08	Cash Box out of position - The validator has detected the cash box to be open or removed.
0x09	Validator Disabled - The validator has been disabled, by the VMC or because of internal conditions
0x0A	Invalid Escrow request - An ESCROW command was requested for a bill not in the escrow position.
0x0B	Bill Rejected - A bill was detected, but rejected because it could not be identified.
0x0C	Possible Credited Bill Removal – There has been an attempt to remove a credited (stacked) bill.
0xFF	Not known or not initialized status

Table 3: Bill validators status codes

Value	Description
0x00	Idle
0x01	Escrow request - An escrow lever activation has been detected.
0x02	Changer Payout Busy - The changer is busy activating payout devices.
0x03	No Credit - A coin was validated but did not get to the place in the system when credit is given.
0x04	Defective Tube Sensor - The changer has detected one of the tube sensors behaving abnormally.
0x05	Double Arrival - Two coins were detected too close together to validate either one.
0x06	Acceptor Unplugged - The changer has detected that the acceptor has been removed.
0x07	Tube Jam - A tube payout attempt has resulted in jammed condition.
0x08	ROM checksum error - The changers internal checksum does not match the calculated checksum.
0x09	Coin Routing Error - A coin has been validated, but did not follow the intended routing.
0x0A	Changer Busy - The changer is busy and can not answer a detailed command right now.
0x0B	Changer was Reset - The changer has detected an Reset condition and has returned to its power-on idle condition.
0x0C	Coin Jam - A coin(s) has jammed in the acceptance path.
0x0D	Possible Credited Coin Removal – There has been an attempt to remove a credited coin.
0xFF	Not known or not initialized status

Table 4: Coin acceptors/changers status codes

Value	Description
0x00	Idle
0x01	Not used in this configuration
0x02	Display request – not used in this configuration
0x03	Begin cashless session
0x04	Cancel request from cashless to VMC
0x05	Vend approved.
0x06	Vend denied.
0x07	End cashless session.
0x08	Cancelled
0x09	Not used in this configuration.
0x0A	Not used in this configuration.
0x0B	Command out of sequence.
0x0C	Not used in this configuration.
0x0D	Revalue approved.
0x0E	Revalue denied
0x0F	Not used in this configuration.

Table 5: Cashless status codes

14. Reset all devices' status

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x50	0x02	[none]	0xAC
INTERFACE answer				
0xFE	0x50	0x02	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will set to 0x00 all devices' status. It is used to clear status and let the INTERFACE to update it in accordance with the new devices' status. It will not reset credits

15. Cashless INIT

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x01	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x01	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will init the cashless device with the corresponding number

16. Cashless ENABLE

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x02	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x02	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will enable the cashless device with the corresponding number

17. Cashless DISABLE

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x03	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x03	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will disable the cashless device with the corresponding number

18. Cashless VEND CANCEL

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x04	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x04	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will send "CANCEL CURRENT SESSION" command to the cashless device.

19. Cashless VEND REQUEST

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x05	<CASHLESS NUMBER> 1 byte (0x01 = cashless #1, 0x02 = cashless #2) <VEND VALUE> - 4 bytes - the value of the selected product to sell - MSB (for example, 0x00 0x00 0x04 0xE2 representing 1250 cents or 12.50EUR/12.50USD)	CRC
INTERFACE answer				
0xFE	0x53	0x05	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will send ask the permission to sell a product using cashless. This command requires to use POLL command to obtain the answer from the cashless device (according to Table 5).

20. Cashless VEND SUCCESS

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x06	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x06	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command must be sent after a successful vend using cashless. Following this command, the interface will substract the product value from the cashless credit, and the cashless device will be instructed to substract th same amount from the customer's credit.

21. Cashless VEND FAIL

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x07	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x07	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command must be sent after a failed sale situation (due to VMC error). The cashless will be instructed to refund the product price to the customer's account.

22. Cashless REVALUE

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x08	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x08	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will transform the remaining cash credit into cashless credit and will refund this amount on customer's account.

23. Cashless READ VECTORS

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x09	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x09	<CASHLESS SETUP> - 8 bytes <CASHLES EXPANSION INFORMATION> - 30 bytes	CRC

This command will return the low level settings of the cashless device, according to MDB protocol.

24. Cashless END SESSION

<HEADER>	<CMD>	<SUBCMD>	<PARAMETERS>	<CRC>
0xFE	0x53	0x0A	<CASHLESS NUMBER> (0x01 = cashless #1, 0x02 = cashless #2)	CRC
INTERFACE answer				
0xFE	0x53	0x0A	0xFB – command execution failed 0xFC – command successfully executed 0xFD – command CRC error	CRC

This command will return turn the session off and will force the cashless device to return to idle state.

IV. High level protocol

Using this mode, the development becomes much easier. The communication with the board and the peripherals is managed by a small application. Commands are not case sensitive. We have used capitalization to facilitate reading.

It is a good idea for your application to retry sending the command few times if you get an "failed" answer. This answer can be returned in the event of a board communication failure. Also it can be returned if you try to address a not connected device.

1. MDBBillInit

GUI command	
Command	**Parameters/Comments**
MDBBillInit	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBBillInit":"success"} or {"MDBBillInit":"failed"}	This command will perform all initialization tasks for the attached MDB bill validator. If something goes wrong or the MDB bill validator is not connected to the board, then the command returns "failed" message.

2. MDBBillEnable

GUI command	
Command	**Parameters/Comments**
MDBBillEnable	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBBillEnable":"success"} or {"MDBBillEnable":"failed"}	This command will activate the attached MDB bill validator. This command must be preceded by the MDBBillInit command. You cannot activate a bill validator if this one is not initialized.

3. MDBBillDisable

GUI command	
Command	**Parameters/Comments**
MDBBillDisable	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBBillDisable":"success"} or {"MDBBillDisable":"failed"}	This command will deactivate the attached MDB bill validator.

4. MDBCoinInit

GUI command	
Command	**Parameters/Comments**
MDBCoinInit	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCoinInit":"success"} or {"MDBCoinInit":"failed"}	This command will initialize the attached MDB coin acceptor/changer.

5. MDBCoinEnable

GUI command	
Command	**Parameters/Comments**
MDBCoinEnable	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCoinEnable":"success"} or {"MDBCoinEnable":"failed"}	This command will enable the attached MDB coin acceptor/changer. This command requires a previous MDBCoinInit command. You cannot enable a coin acceptor/changer if it was not previously initialized.

6. MDBCoinDisable

GUI command	
Command	**Parameters/Comments**
MDBCoinDisable	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCoinDisable":"success"} or {"MDBCoinDisable":"failed"}	This command will disable the attached MDB coin acceptor/changer.

7. MDBBillSettings

GUI command	
Command	**Parameters/Comments**
MDBBillSettings	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**

{
  "Type":"BillSettings",
  "level":"1",
  "CurrencyCode":"1642",
  "ScalingFactor":"100",
  "DecimalPlaces":"2",
  "StackerCapacity":"300",
  "EscrowAvailable":"true",
  "BillValues":[
    {"BillValue":"1"},
    {"BillValue":"5"},
    {"BillValue":"10"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"},
    {"BillValue":"0"}
  ],
  "Manufacturer":"ITL",
  "SerialNumber":"000051005569",
  "Model":"BV0020 000",
  "SWVersion":"1042"
}
	Using this command you can get informations about the MDB connected bill validator.
	
	<BillValues> array contains the bill values that the device will recognize.
	
	Most of those are low level informations and you do not need to use them in you application, since all MDB protocol will be handled by the RASPIVEND board.
	
	You can use, for example, the serial number and model to keep tracking of the payment systems, service activities, cleaning, etc.

8. MDBCoinSettings

GUI command	
Command	**Parameters/Comments**
MDBCoinSettings	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**

{
  "Type":"CoinSettings",
  "Level":"3",
  "CurrencyCode":"0040",
  "ScalingFactor":"10",
  "DecimalPlaces":"2",
  "CoinValues":[
    {"CoinValue":"1"},
    {"CoinValue":"5"},
    {"CoinValue":"0"},
    {"CoinValue":"0"},
    {"CoinValue":"0"},
    {"CoinValue":"0"},
    {"CoinValue":"0"},
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  "ChangeCoins":[
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    {"ChangeCoin":"true"},
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    {"ChangeCoin":"false"},
    {"ChangeCoin":"false"},
    {"ChangeCoin":"false"},
    {"ChangeCoin":"false"},
    {"ChangeCoin":"false"}
  ],
  "Manufacturer":"NRI",
  "SerialNumber":"NRI00136295-",
  "Model":"046G-46.F400",
  "SWVersion":"12320"
}
	Using this command you can get informations about the MDB connected coin acceptors/changers.
	
	<CoinValues> array contains the values that the device will recognize.
	<ChangeCoins> array contains informations about the coins that the device can use to return change. If all elements are "false", then the device does not have change capabilities.
	
	Most of those are low level informations and you do not need to use them in you application, since all MDB protocol will be handled by the RASPIVEND board.

9. MDBSetMaxCredit

GUI command	
Command	**Parameters/Comments**
MDBSetMaxCredit("NNNN")	Maximum MDB credit accepted - 32 bit positive value When there is a bill in escrow, where <current_MDB_Credit> + <MDB_escrow_bill_value> is bigger than NNNN, then that bill wil be returned to the customer. For coins, your application must disable the coin acceptor/changer, once the maximum credit is reached. The value is multiplied by the 100 scaling factor (for example, for 1EUR you have to set this value to 100).
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBSetMaxCredit":"NNNN"}	This command will return the value you have sent. For safety reasons (eliminate the communication errors), you must commit this action with MDBSetMaxCreditOK, after you verify that the returned value is the same with the sent value.

10. MDBSetMaxCreditOK

GUI command	
Command	**Parameters/Comments**
MDBSetMaxCreditOK	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBSetMaxCreditOK":"success"} or {"MDBSetMaxCreditOK":"failed"}	This command will commit the change of the MaxCredit variable on the RASPIVEND board.

11. MDBSetCurrentCredit

GUI command	
Command	**Parameters/Comments**
MDBSetCurrentCredit("NNNN")	Set the value of the MDB module curernt credit. - 32 bit positive value This value must be set after each succesful vend and before issuing the "MDBCashlessRevalue" command. This is the value that the RASPIVEND board will try to use for revalue. The value is multiplied by the 100 scaling factor (for example, for 1EUR you have to set this value to 100). This command will modify the value of CurrentCreditCash. You can read this variable by issuing the MDBPoll command.
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBSetCurrentCredit":"NNNN"}	This command will return the value you have sent. For safety reasons (eliminate the communication errors), you must commit this action with MDBSetCurrentCreditOK, after you verify that the returned value is the same with the sent value.

12. MDBSetCurrentCreditOK

GUI command	
Command	**Parameters/Comments**
MDBSetCurrentCreditOK	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBSetCurrentCreditOK":"success"} or {"MDBSetCurrentCreditOK":"failed"}	This command will commit the change of the CurrentCreditCash variable on the RASPIVEND board.

13. MDBSetChange

GUI command	
Command	**Parameters/Comments**
MDBSetChange("NNNN")	Set the value of the change that MDB module will return when the MDBSetChangeOK command will be issued. - 32 bit positive value This value must be set before any change return action The value is multiplied by the 100 scaling factor (for example, for 1EUR you have to set this value to 100).
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBSetChange":"NNNN"}	This command will return the value you have sent. For safety reasons (eliminate the communication errors), you must commit this action with MDBSetChangeOK, after you verify that the returned value is the same with the sent value.

14. MDBSetChangeOK

GUI command	
Command	**Parameters/Comments**
MDBSetChangeOK	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBSetChangeOK":"success"} or {"MDBSetChangeOK":"failed"}	This command will commit the MDBSetChange command and will try to return the requested amount to the customer. You need to check the changer status by repeatedly issuing the MDBPoll command and parsing the changer status variable. This variable will be described on MDBPoll section.

15. MDBCreditReset

GUI command	
Command	**Parameters/Comments**
MDBCreditReset	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCreditReset":"success"} or {"MDBCreditReset":"failed"}	This command will set the CurerntCreditCash variable to 0. It is recommended to use this command before activating the payment systems on each transaction.

16. MDBPoll

GUI command	
Command	**Parameters/Comments**
MDBPoll	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**

{
　"Type":"Poll",
　"CurrentCreditCash":"0",
　"CurrentCreditCashless":"0",
　"BillStat":"0B000B00",
　"CoinStat":"00000200",
　"CashlessStat":"FFFFFFFF",
　"CashlessID":"FFFFFFFF",
　"AvailableChange","6110"
}
	This command will return the current MDB module's information. It is recommended to issue this command at least twice a second while the transaction is opened (when the payment systems are enabled), to check the current credit and to disable the payment systems when the credit is the same or bigger than the selected product price.
	- <CurrentCreditCash> is the accumulated cash credit;
	- <CurrentCreditCashless> is the credit available on the customer's cashless payment media;
	- <BilStat> contains the last 4 hexadecimal bill validator status codes (according with the Table 2 on page 14). The leftmost value is the older one.
	- <CoinStat> contains the last 4 hexadecimal coin acceptor status codes (according with the Table 3 on page 15). The leftmost value is the older one.
	- <CaslessStat> contains the last 4 hexadecimal cashless devices status codes (according with the Table 4 on page 16). The leftmost value is the older one.
	- <CashlessID> contains the internal ID of the customer's media. You can use this for tracking purposes.
	It is recommended to keep an eye on this informations during the transaction. When there is no transaction open it is recommended to periodically poll this status variable to detect payment systems jam.
	If a payment system was not initialized, it's corresponding status variable will have "FFFFFFFF" value.
	- <AvailableChange> is the total value of the coins in the coing changer. This value is updated on every coin enable or coin disable command

17. MDBResetStatus

GUI command	
Command	**Parameters/Comments**
MDBResetStatus	[none]
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBResetStatus":"success"} or {"MDBResetStatus":"failed"}	This command will set to "00000000" all MDB payment system status variables. If a payment system was not initialized, it's corresponding status variable will have "FFFFFFFF" value.

18. MDBCashlessInit

GUI command	
Command	**Parameters/Comments**
MDBCashlessInit(N)	"N" is the address of the cashless to be initialized (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessInit":"success"} or {"MDBCashlessInit":"failed"}	This command will perform all initialization tasks for the attached MDB cashless system. If something goes wrong or the MDB cashless system is not connected to the board, then the command returns "failed" message.

19. MDBCashlessEnable

GUI command	
Command	**Parameters/Comments**
MDBCashlessEnable(N)	"N" is the address of the cashless to be enabled (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessEnable":"success"} or {"MDBCashlessEnable":"failed"}	This command will activate the attached MDB cashless system. This command must be preceded by the MDBCashlessInit command. You cannot activate a cashless system if this one is not initialized.

20. MDBCashlessDisable

GUI command	
Command	**Parameters/Comments**
MDBCashlessDisable(N)	"N" is the address of the cashless to be disabled (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessDisable":"success"} or {"MDBCashlessDisable":"failed"}	This command will deactivate the attached MDB cashless system.

21. MDBCashlessSettings

GUI command	
Command	**Parameters/Comments**
MDBCashlessSettings(N)	"N" is the address of the cashless to be readed (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**

{
  "Type":"Cashless",
  "level":"2",
  "CurrencyCode":"1978",
  "ScalingFactor":"1",
  "DecimalPlaces":"2",
  "CanRevalue":"True",
  "Manufacturer":"COM",
  "SerialNumber":"000000114761",
  "Model":"NEW_EUROKEY ",
  "SWVersion":"513"
}
	This command will return the specified cashless device low level informations. You will probably don't need those informations, unless you want to track the payment systems for service/maintenance reasons.

22. MDBCashlessVendRequest

GUI command	
Command	**Parameters/Comments**
MDBCashlessVendRequest(NNNN)	Set the value of the requested credit will be withdrawn from the customer's cashless media.. - 32 bit positive value This value must be set before any MDBCashlessVendRequestOK command. The value is multiplied by the 100 scaling factor (for example, for 1EUR you have to set this value to 100).
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessVendRequest":"100"}	This command will return the value you have sent. For safety reasons (eliminate the communication errors), you must commit this action with MDBCashlessVendRequestOK, after you verify that the returned value is the same with the sent value.

23. MDBCashlessVendRequestOK

GUI command	
Command	**Parameters/Comments**
MDBCashlessVendRequestOK(N)	"N" is the address of the cashless to request vend permission(1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessVendRequestOK":"success"} or {"MDBCashlessVendRequestOK":"failed"}	This command will commit the MDBCashlessVendRequest command. You must use the MDBPoll command to verify the response of the cashless system (vend approved or vend denied) according to Table 4 on page 16. If the status changes to "vend approved" then you have to issue the command "MDBCashlessVendSuccess" to withrawal the MDBCashlessVendRequest value from the customer's cashless payment media.

24. MDBCashlessVendSuccess

GUI command	
Command	**Parameters/Comments**
MDBCashlessVendSuccess(N)	"N" is the address of the cashless to withdraw (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessVendSuccess":"success"} or {"MDBCashlessVendSuccess":"failed"}	This command will send transaction success information to the cashless system. You must use the MDBPoll command to verify the response of the cashless system according to Table 4 on page 16).

25. MDBCashlessVendFailed

GUI command	
Command	**Parameters/Comments**
MDBCashlessVendFailed(N)	"N" is the address of the cashless to notify that the transaction has failed (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessVendFailed":"success"} or {"MDBCashlessVendFailed":"failed"}	This command will send transaction failed information to the cashless system. You must use the MDBPoll command to verify the response of the cashless system according to Table 4 on page 16).

26. MDBCashlessRevalue

GUI command	
Command	**Parameters/Comments**
MDBCashlessRevalue(N)	"N" is the address of the cashless to revalue (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessRevalue":"success"} or {"MDBCashlessRevalue":"failed"}	This command will send load the CurentCreditCash value to the cashless. You must use the MDBPoll command to verify the response of the cashless system according to Table 4 on page 16). Also, your application must handle the maximum revalue settings for the cashless system. You have to set the cashless revalue only in it's aloud range. If you will not manage this, then the cashless can randomly goes to overflow.

27. MDBCashlessEndSession

GUI command	
Command	**Parameters/Comments**
MDBCashlessEndSession(N)	"N" is the address of the cashless to close the session (1 for the first cashless device and 2 for the second cashless device)
RASPIVEND daemon answer	
Answer	**Parameters/Comments**
{"MDBCashlessEndSession":"success"} or {"MDBCashlessEndSession":"failed"}	This command will force the cashless system to close the current session. If the media is not removed, most of the time, the cashless system will automatically open a new session.

NOTES: