PICOVEND MDB BRIDGE COMBO FIRMWARE (MDB master/cashless/combo to USB) v2022-05-11

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I. Introduction

This device was designed as a bridge between MDB vending machine (where it shows itself as a cashless device) and MDB payment systems (where it shows itself as a vending machine controller).
It can be used to simulate a cashless device to a vending machine, to manage MDB payment systems for a computer, SBC or tablet application or as a bridge, to handle both vending machine's cashless messages and payment systems mesasges.
This way, your PC/Raspberry Pi/Android application can stay in the middle and handle the MDB payment systems on one hand and act as a cashless device to the vending machine. All cash/cashless credit from the attached payment systems can be transferred to the vending machine as a cashless credit, by successive use of begin/cancel session for each cash/cashless amount received.
It can, of course, work as a standalone MDB master or standalone MDB cashless (connected to the computer, Raspberry Pi, Android device, etc.) to create a cashless device or a vending machine

The device is using a simple ASCII protocol over USB interface. There is no need for you to have deep MDB knowledge, however, some knowledge about MDB will help you faster and better understand the interface functionality.

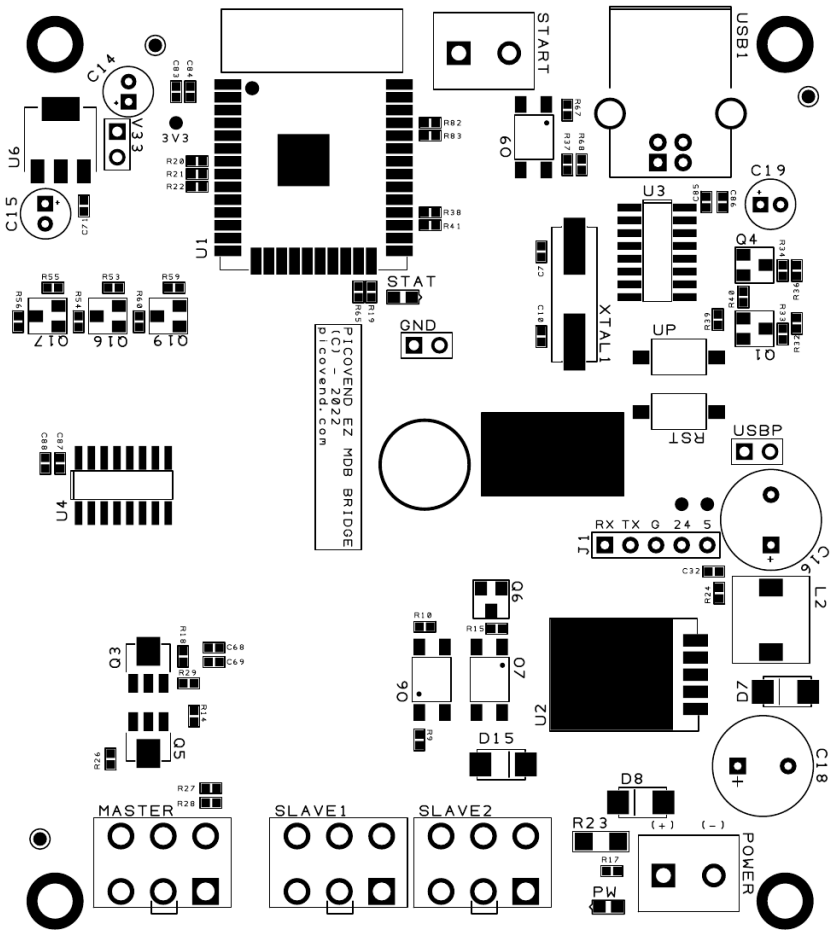
Standard package content:
- PICOVEND EZ MDB BRIDGE;
- MDB cable to connect to the vending machine controller

NOTE!!! - this device can handle one MDB bill validatory/recycler, one MDB coin acceptor/changer and two MDB cashless devices (Level 2 or Level 3 with always idle cashless device).

During it's activity, the interface keeps some internal counters (total number of bills validated, total value of validated bills, coin, cashless transactions, etc.). At any moment, you can read those counters in order to obtain some statistics. Also, the counters may be used as a verification, if some messages are lost. For example, you may constantly poll for counters to check if you missed some bills or coins.

II. Hardware

A. Board overview



B. Connectors description

1. USB1 – is the main USB connector to interface with the computer, Raspberry Pi, android tablet, etc. Requires an USB-B cable (not included in the package);
2. START – on this connector you can plug a NO push button, in order to begin a cashless session by a button press (for Level 2 vending machines or for machines with Level 3, but no Always Idle support);
3. MASTER – it is the MDB master connector. Here must be connected all the payment systems you need to manage.
4. SLAVE1 and SLAVE2 – those connectors are used to interface with the vending machine controller. It does not matter which one of them is connected to the vending machine. The free one can be used to connect the MDB payment systems you want to be managed by the vending machine itself and not by you.
5. POWER – it is used to power the device (only when used as a standalone MDB master to USB interface). When the interface is connected to a vending machine controller by any of the SLAVE connectors, it does not need external power.

C. Communication interfaces

USB serial interface is practically an USB to serial converter embedded on the board and is using the following communication parameters:
- baudrate – 115200bps;
- data bits – 8;
- stop bits – 1;
- parity – none;
- flow control – no flow control (either hardware or software).

USB interface is using a driver for Windows OS. For Raspberry Pi (or compatible), Android and most of the Linux distributions with new kernels, the OS will automatically load the correct kernel modules.

All commands must end with <CR> and <LF> (0x13, 0x10)
Also, all answers have <CR> and <LF> at the end. If you are using non-buffered serial interface reading, make sure your application reads until <LF>.

Sometimes, more than one message will be received (for example, a response to your command and an unsolicited message or an answer with the reason of the command fail). Your applicatoin needs to receive the entire message and parse it by checking against all command answers related to your last command and also against all available unsolicited message (see unsolicited messages description below), breaking the entire payload to substrings/messages.

III. Communication protocol

A. MDB master related commands and answers

Commands are case-sensitive, only caps commands are accepted
Answers are always upper case. All master commands have the “MM” prefix.

B. Bill validator/recycler related commands

1. Enable bill validator

Command	
MMBILLENABLE	This command will enable all supported bill acceptance on the bill validator. If the bill validator is supporting escrow function, it will be automatically activated.
Possible answers	
- MMBILLENABLEFAIL	- If the bill validator could not be enabled when the BILLENABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: bill validator was not initialized, bill validator already enabled, MDB communication error, etc.
- MMBILLENABLEOK	- If the command is correctly received and interpreted by the interface.

2. Selective bills enable

Command	
MMBILLSELECTENABLE(X)	This command will enable some of supported bill acceptance on the bill validator. If the bill validator is supporting escrow function, it will be automatically activated. - X is a 16bit number corresponding with MDB BILL TYPE COMMAND (0x34) BILL ENABLE parameter. Bit 0 correspond with bill type 0 and bit 15 correspond with the bill type 15. This command allows your application to enable only specific bill/bills. You can obtain bill type values after the interface is automatically initialized the bill validator/recycler using BILLVALUES? command, explained later below.
Possible answers	
- MMBILLSELECTENABLEFAIL	- If the bill validator could not be enabled when the MMBILLSELECTENABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: bill validator was not initialized, bill validator already enabled, MDB communication error, etc.
- MMBILLSELECTENABLEOK	- If the command is correctly received and interpreted by the interface.

3. Disable bill validator

Command	
MMBILLDISABLE	This command will disable all bills acceptance. Your application may disable the bill validator when the maximum allowed credit value has been reached, when a malfunction occurs or during product dispensing/preparation
Possible answers	
- MMBILLDISABLEFAIL	- If the bill validator could not be disabled when the MMBILLDISABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: bill validator was not initialized, bill validator already disabled, MDB communication error, etc.
- MMBILLDISABLEOK	- If the command is correctly received and interpreted by the interface.

4. Reset bill validator

Command	
MMBILLRESET	This command will reset the bill validator. The interface will automatically initialize the bill validator again and your application needs to enable or selective enable it do make it available for receiving bills. After issuing this command, you will receive some unsolicited messages while the interface is initializing the bill validator. You may receive the following messages: - MMBILLSTACKNOTFULL(X) - MMBILLREADY - MMBILLOK Please check the unsolicited messages information below in the “Interface unsolicited messages” section.
Possible answers	
- MMBILLRESETFAIL	- If the bill validator could not be reset when the MMBILLRESET is received, you will receive this answer. Possible reasons (but not limited to those) could be: bill validator was not initialized, bill validator already disabled, MDB communication error, etc.
- MMBILLRESETOK	- If the command is correctly received and interpreted by the interface.

5. Approve bill acceptance while a bill is in escrow position

Command	
MMBILLACCEPT	This command will send the ACCEPT command to the bill validator after the MMBILLESCROW(X) unsolicited message was received.
Possible answers	
- MMBILLACCEPTFAIL - MMBILLACCEPTOK	- If the bill validator could not be reset when the MMBILLACCEPT is received, you will receive this answer. Possible reasons (but not limited to those) could be: bill validator was not initialized, bill validator already disabled, MDB communication error, etc. - If the command is correctly received and interpreted by the interface.

6. Reject bill while a bill is in escrow position

Command	
MMBILLREJECT	This command will send the REJECT command to the bill validator after the BILLESCROW(X) unsolicited message was received.
Possible answers	
- MMBILLREJECTFAIL - MMBILLREJECTOK	- If the bill validator could not be reset when the BILLACCEPT is received, you will receive this answer. Possible reasons (but not limited to those) could be: bill validator was not initialized, bill validator already disabled, MDB communication error, etc. - If the command is correctly received and interpreted by the interface.

7. Get last 10 bill status codes

Command	
MMBILLSTATUS?	This command will ask for the last 10 bill validator status codes. You application can use this to periodically ask the bill validator status, if it missed some unsolicited messages.
Possible answers	
- MMBILLSTATUS(A,B,C,D,E,F,G,H,I,J)	- A to J are some byte values, corresponding with the bill validator status bytes received on bill poll. You need to check with MDB documentation for the bytes interpretation. For example, 8 means “cashbox removed”. This vector is a FIFO loop and you may need to read it periodically.

8. Check if the bill validator was initialized by the interface

Command	
MMBILLINITED?	This command will check if the bill validator was initialized by the interface after power-up or after issuing MMBILLRESET command
Possible answers	
- MMBILLINITEDOK - MMBILLNOTINITED	- The bill validator was successfully initialized - The bill validator was not initialized (missing or not initialized, yet).

9. Check if the bill validator was enabled

Command	
MMBILLACTIVE?	This command will check if the bill validator was previously activated by a MMBILLENABLE or a MMBILLSELECTENABLE command.
Possible answers	
- MMBILLACTIVEOK - MMBILLNOTACTIVE	- The bill validator is currently enabled - The bill validator is not currently enabled

10. Get the bill validator configured bills values

Command	
MMBILLVALUES?	This command will read the bill validator configured bills values. This vector is read during automatic bill validator initialization phase, after a power-up or after issuing MMBILLRESET command.
Possible answers	
- MMBILLVALUES(A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P) - MMBILLNOTINITED	- A to P are the scaled values of the bills recognized and accepted by the bill validator. You can use this to obtain necessary information for selective bill activation in order to avoid accepting bills values higher thatn the maximum accepted credit. - The bill validator was not previously initialized and the bills values information is not available.

11. Get the bill validator information

Command	
MMBILLINFOREQ?	This command will read the bill validator information for statistics and payment systems inventory tracking. This information is read during automatic bill validator initialization phase, after a power-up or after issuing MMBILLRESET command.
Possible answers	
- MMBILLINFOREQ(A,B,C) - MMBILLNOTINITED	- A is the bill validator manufacturer code, fixed length – 3 characters (ASCII) - B is the bill validator internal serial number, fixed length, 12 characters (ASCII) - C is the bill validator internal model number, fixed length, 12 characters (ASCII) - The bill validator was not previously initialized and the information is not available

12. Get the bill validator settings

Command	
MMBILLSETTINGS?	This command will read the bill validator settings. This information is read during automatic bill validator initialization phase, after a power-up or after issuing MMBILLRESET command.
Possible answers	
- MMBILLSETTINGS(A,B,C,D,E,F)	- A is the bill validator feature level (decimal) - B is the bill validator country code (HEX) - C is the bill validator scaling factor (decimal) - D is the bill validator decimal places (decimal) - E is the bill validator stacker capacity (decimal) - F is the bill validator escrow support (1 if the bill validator supports escrow function or 0 if the bill validator does not support escrow function)
- MMBILLNOTINITED	- The bill validator was not previously initialized and the information is not available

13. Get the bill recycler bill type values

Command	
MMRECYCLERBILLS?	This command will read the bill recycler accepted bills values. This information is read during automatic bill recycler initialization phase, after a power-up or after issuing BILLRESET command.
Possible answers	
- MMRECYCLERBILLS(A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P)	- A to P is the flag for the bills that the bill recycler can recycle (can give back to the customers for payout/change). If the value is 0, the corresponding bill value is not available for recycling. If the value is 1, the recycler can use the corresponding bill For recycling. Use MMBILLVALUES to obtain the real bills value.
- MMBILLNOTINITED	- The bill validator was not previously initialized and the information is not available

14. Get the bills set for recycling by the user application

Command	
MMRECYCLERSETBILLS?	This command will read the bills enabled for recycling, by the user application
Possible answers	
- MMRECYCLERSETBILLS(A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P)	- A to P is the value for recycling mode: - 0 – this bill is not enabled for recycling; - 1 – only high quality bills are enabled for recycling; - 2 – only high and medium bills are enabled for recycling; - 3 – use all possible bills for recycling (this is the recommended option)

15. Set the bills set for recycling by the user application

Command	
MMRECYCLERSETBILLS(A,B,C,D,E,F,G,H,I,J,K,L, M,N,O,P)	This command will set the bills enabled for recycling, by the user application - A to P is the value for recycling mode: - 0 – this bill is not enabled for recycling; - 1 – only high quality bills are enabled for recycling; - 2 – only high and medium bills are enabled for recycling; - 3 – use all possible bills for recycling (this is the recommended option)
Possible answers	
- MMRECYCLERSETBILLSOK	- The bill enabled for recycling were successfully set.

16. Get tot total value of bills available for recycling

Command	
MMRECYCLERSTOCKVALUE?	This command will read the total value of the bill available for recycling in the bill recycler
Possible answers	
- MMRECYCLERSTOCKVALUE(X)	- X is total value of the bills available for recycling in the bill recycler

17. Dispense bills as a change to customer

Command	
MMBILLDISPENSEVALUE(X)	This command will start the bill dispensing operation. - X is the value that bill recycler should dispense to the customer.
Possible answers	
- MMBILLDISPENSEVALUEOK - MMBILLDISPENSEVALUEFAIL	- If the command is successfully sent to the bill recycler - If the command fails while sending to recycler

18. Dispense bills as a change to customer

Command	
MMBILLDISPENSEVALUE(X)	This command will start the bill dispensing operation. - X is the value that bill recycler should dispense to the customer.
Possible answers	
- MMBILLDISPENSEVALUEOK - MMBILLDISPENSEVALUEFAIL - MMBILLDISPENSERNOTENABLED	- If the command is successfully sent to the bill recycler - If the command fails while sending to recycler - if the dispensing function was not enabled

19. Get current bill stacker status

Command	
MMBILLSTACKER?	This command will read the current bill stacker status
Possible answers	
- MMBILLSTACKER(X) - MMBILLSTACKEROK - MMBILLSTACKERFAIL	- X is the number of bills currently in the bill validator stacker. - If the command is successfully sent to the bill validator. - If the command fails while sending to the bill validator.

C. Coin acceptor/changer related commands

1. Enable coin acceptor/changer

Command	
MMCOINENABLE	This command will enable all supported coins acceptance on the coin acceptor.
Possible answers	
- MMCOINENABLEFAIL	- If the coin acceptor/changer could not be enabled when the MMCOINENABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: coin acceptor was not initialized, coin acceptor already enabled, MDB communication error, etc.
- MMCOINENABLEOK	- If the command is correctly received and interpreted by the interface.

2. Selective coins enable

Command	
MMCOINSELECTENABLE(X)	This command will enable some of supported coins acceptance on the coin acceptor. If the coin acceptor is supporting change function, the manual coin dispense will be automatically enabled - X is a 16bit number corresponding with MDB COIN TYPE COMMAND (0x0C) COIN ENABLE parameter. Bit 0 correspond with bill type 0 and bit 15 correspond with the bill type 15. This command allows your application to enable only specific coin/coins. You can obtain coin type values after the interface is automatically initialized the coin acceptor/changer using MMCOINVALUES? command, explained later below.
Possible answers	
- MMCOINSELECTENABLEFAIL	- If the coin acceptor could not be enabled when the MMCOINSELECTENABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: coin acceptor was not initialized, coin acceptor already enabled, MDB communication error, etc.
- MMCOINSELECTENABLEOK	- If the command is correctly received and interpreted by the interface.

3. Disable coin acceptor

Command	
MMCOINDISABLE	This command will disable all coins acceptance. Your application may disable the coin acceptor when the maximum allowed credit value has been reached, when a malfunction occurs or during product dispensing/preparation
Possible answers	
- MMCOINDISABLEFAIL	- If the bill validator could not be disabled when the MMCOINDISABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: bill validator was not initialized, bill validator already disabled, MDB communication error, etc.
- MMCOINDISABLEOK	- If the command is correctly received and interpreted by the interface.

4. Reset coin acceptor

Command	
MMCOINRESET	This command will reset the coin acceptor/changer. The interface will automatically initialize the coin acceptor/changer again and your application needs to enable or selective enable it do make it available for receiving coins. After issuing this command, you will receive some unsolicited messages while the interface is initializing the bill validator. You may receive the following messages: - MMCOINREADY - MMCOINOK Please check the unsolicited messages information below in the “Interface unsolicited messages” section.
Possible answers	
- MMCOINRESETFAIL	- If the coin acceptor/changer could not be reset when the MMCOINRESET is received, you will receive this answer. Possible reasons (but not limited to those) could be: coin acceptor was not initialized, coin acceptor already disabled, MDB communication error, etc.
- MMCOINRESETOK	- If the command is correctly received and interpreted by the interface.

5. Get total value of coins in tubes (for coin changers only)

Command	
MMCOINTBSTATUS?	This command will get the total coins value in changer’s tubes. For changers with more than 255 same type coins on a tube or multiple tubes, the changer always returns 255 for a tube. Do not use this command for inventory management.
Possible answers	
- MMCOINTBSTATUS(X)	- X is the total scaled value of the coins in the coin changer tubes.
- MMCOINTBSTATUSOK	- If the command is correctly received and interpreted by the interface.
- MMCOINTBSTATUSFAIL	- If the command was not correctly received and interpreted by the interface.

6. Dispense some coins (change) to the customer – obsolete, try to use COINAP command whenever the coin acceptor/changer supports it.

Command	
MMCOINDISPENSE(X)	This command will start coin dispensing for the X value (for example, MMCOINDISPENSE(120) will dispense 1.20EUR. This command is obsolete end you must use MMCOINAP instead it the coin changer supports it. Using this command is much slower than the MMCOINAP command since it will dispense one coin at a time.
Possible answers	
- MMCOINDISPENSEOK	- If the command is correctly received and interpreted by the interface and, also, the changer managed to successfully or not dispensed the coins
- MMCOINPAYBUSY	- You will receive this message until the changer manages to return the entire amount or fails for some reason (not enough change,
- MMCOINDISPENSEFAIL	- If the command was not correctly received and interpreted by the interface or if the changer is returning an error.
- MMCHANGEREMAINING(X)	- X is the total value that could not be dispensed by the changer (due to an internal error, missing coins stock, etc.)

7. Dispense some coins using MDB alternative payout method

Command	
MMCOINAP(X)	This command will start coin dispensing for the X value (for example, MMCOINAP(120) will dispense 1.20EUR.
Possible answers	
- MMCOINAPOK	- If the command is correctly received and interpreted by the interface and, also, the changer managed to successfully or not dispensed the coins
- MMCOINPAYBUSY	- You will receive this message until the changer manages to return the entire amount or fails for some reason (not enough change,
- MMCOINAPFAIL	- If the command was not correctly received and interpreted by the interface or if the changer is returning an error.
- MMCHANGEREMAINING(X)	- X is the total value that could not be dispensed by the changer (due to an internal error, missing coins stock, etc.)

8. Check if the coin acceptor/changer was initialized by the interface

Command	
MMCOININITED?	This command will check if the coin acceptor was initialized by the interface after power-up or after issuing MMCOINRESET command
Possible answers	
- MMCOININITEDOK - MMCOINOTINITED	- The bill validator was successfully initialized - The bill validator was not initialized (missing or not initialized, yet).

9. Check if the coin acceptor/changer was enabled

Command	
MMCOINACTIVE?	This command will check if the coin acceptor/changer was previously activated by a MMCOINENABLE or a MMCOINSELECTENABLE command.
Possible answers	
- MMCOINACTIVEOK - MMCOINNOTACTIVE	- The coin acceptor/changer is currently enabled - The coin acceptor/changer is not currently enabled

10. Get last 10 coin acceptor/changer codes

Command	
MMCOINSTATUS?	This command will ask for the last 10 coin acceptor/changer status codes. You application can use this to periodically ask the coin acceptor/changer status, if it missed some unsolicited messages.
Possible answers	
- MMCOINSTATUS(A,B,C,D,E,F,G,H,I,J)	- A to J are some byte values, corresponding with the coin acceptor/changer status bytes received on coin poll. You need to check with MDB documentation for the bytes interpretation. For example, 7 means “tube jam”. This vector is a FIFO loop and you may need to read it periodically.

11. Get the coin acceptor/changer configured coins values

Command	
MMCOINVALUES?	This command will read the coin acceptor/changer configured coins values. This vector is read during automatic coin validator initialization phase, after a power-up or after issuing MMCOINRESET command.
Possible answers	
- MMCOINVALUES(A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P) - MMCOINNOTINITED	- A to P are the scaled values of the coins recognized and accepted by the coin acceptor/changer. You can use this to obtain necessary information for selective coin activation in order to avoid accepting coins values higher than the maximum accepted credit. - The coin acceptor/changer was not previously initialized and the coins values information is not available.

12. Get the coin acceptor/changer information

Command	
MMCOININFOREQ?	This command will read the coin acceptor/changer information for statistics and payment systems inventory tracking. This information is read during automatic coin acceptor/changer initialization phase, after a power-up or after issuing MMCOINRESET command.
Possible answers	
- MMCOININFOREQ(A,B,C)	- A is the coin acceptor/changer manufacturer code, fixed length – 3 characters (ASCII) - B is the coin acceptor/changer internal serial number, fixed length, 12 characters (ASCII) - C is the coin acceptor/changer internal model number, fixed length, 12 characters (ASCII)
- MMCOINNOTINITED	- The coin acceptor was not previously initialized and the information is not available

13. Get the coin acceptor/changer settings

Command	
MMCOINSETTINGS?	This command will read the bill validator settings. This information is read during automatic bill validator initialization phase, after a power-up or after issuing MMCOINRESET command.
Possible answers	
- MMCOINSETTINGS(A,B,C,D,E,F,G,H,I,J,K,L, M,N,O,P,Q,R,S)	- A is the coin acceptor feature level (decimal) - B is the coin acceptor country code (HEX) - C is the coin acceptor scaling factor (decimal) - D is the coin acceptor decimal places (decimal) - E to S are tube flags. Each coin type where the corresponding flag is set to 1, can be stored in changer's tubes and used for change. Each coin type where the corresponding flag is 0, cannot be stored in changer's tubes.
- MMCOINNOTINITED	- The coin acceptor/changer was not previously initialized and the information is not available

14. Get the token values

Command	
MMTOKENVALUES?	This command will read coin tokens set into the interface memory.
Possible answers	
- MMTOKENVALUES(A,B,C,D,E,F,G,H,I,J,K,L, M,N,O,P)	- A to P are the value set for each token. These values are used if you have connected a coin acceptor/changer that is sending 0XFF for coin values if a token is accepted. You don't need to use ththat if your coin acceptor/changer is directly reporting the token value.
- MMCOINNOTINITED	- The coin acceptor/changer was not previously initialized and the information is not available

15. Set the token values

Command	
- MMTOKENVALUES(A,B,C,D,E,F,G,H,I,J,K,L, M,N,O,P)	This command will set the token values in the interface. - A to P are the value set for each token. These values are used if you have connected a coin acceptor/changer that is sending 0xFF for coin values if a token is accepted. You don't need to use that if your coin acceptor/changer is directly reporting the token value.
Possible answers	
- MMTOKENVALUESOK - MMCOINNOTINITED	- The coin acceptor/changer have been set. - The coin acceptor/changer was not previously initialized and you cannot set this value.

D. Cashless related commands

All commands and messages have the following format MMCSLS<X>CMD where <X> can be “1” or “2”, depending on the cashless number you want to address, for example MMCSLS1RESET or MMCSLS2RESET.

1. Reset cashless device

Command	
MMCSLS<X>RESET	This command will reset the cashless device After issuing this command, you will receive some unsolicited messages while the interface is initializing the cashless device. You may receive the following messages: - MMCSLS<X>READY - MMCSLS<X>OK Please check the unsolicited messages information below in the “Interface unsolicited messages” section.
Possible answers	
- MMCSLS<X>RESETFAIL	- If the cashless device could not be reset when the MMCSLS<X>RESET is received, you will receive this answer. Possible reasons (but not limited to those) could be: cashless device was not initialized, MDB communication error, etc.
- MMCSLS<X>RESETOK	- If the command is correctly received and interpreted by the interface.

2. Enable cashless device

Command	
MMCSLS<X>ENABLE	This command will enable the cashless device.
Possible answers	
- MMCSLS<X>ENABLEFAIL	- If the cashless device could not be enabled when the MMCSLS<X>ENABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: cashless device was not initialized, cashless device already enabled, MDB communication error, etc.
- MMCSLS<X>ENABLEOK	- If the command is correctly received and interpreted by the interface.

3. Disable cashless device

Command	
MMCSLS<X>DISABLE	This command will disable the cashless device.
Possible answers	
- MMCSLS<X>DISABLEFAIL	- If the cashless device could not be disabled when the MMCSLS<X>DISABLE is received, you will receive this answer. Possible reasons (but not limited to those) could be: cashless device was not initialized, cashless device already disabled, MDB communication error, etc.
- MMCSLS<X>DISABLEOK	- If the command is correctly received and interpreted by the interface.

4. Cancel current cashless activity

Command	
MMCSLS<X>CANCEL	This command will cancel all current cashless device activities.
Possible answers	
- MMCSLS<X>CANCELFAIL	- If the cashless device could not be disabled when the MMCSLS<X>CANCEL is received, you will receive this answer. Possible reasons (but not limited to those) could be: cashless device was not initialized, cashless device already idle, MDB communication error, etc.
- MMCSLS<X>CANCELOK	- If the command is correctly received and interpreted by the interface.

5. Request cashless current revalue limit

Command	
MMCSLS<X>REVALLIMITREQ?	This command will read the current revalue limit.
Possible answers	
- MMCSLS<X>REVALLIMIT(X)	- X is the maximum revalue amount accepted by the cashless device for further MMCSLS<X>REVALREQ (cashless revalue request) command.
- MMCSLS<X>NOSESSION	- Cashless device is not in session so, the revalue is not available.
- MMCSLS<X>NOREVALSUPPORT	- If the cashless device or media does not support revalue command
- MMCSLS<X>REVALLIMITFAIL	- Revalue limit request command was not successfully excuted.

6. Request approval for a vend

Command	
MMCSLS<X>VNDREQ(A,B)	This command will request a vend approval from the cashless device - A is the scaled price (16bit value maximum) - B is the item ID/selection number (16bit value maximum)
Possible answers	
- MMCSLS<X>NOSESSION	- You will receive this answer if you are requesting for a vend approval and the cashless device is Level 2 or Level 3 without Always Idle support and a cashless session is not opened.
- MMCSLS<X>VNDREQOK	- If the interface successfully received and parsed the command.
- MMCSLS<X>VNDREQFAIL	- If the interface was not able to successfully receive and parse the command.

7. Confirm a success vend to the cashless device

Command	
MMCSLS<X>VNDSUCC(A)	This command will confirm the product dispensing was successful - A is the item ID/selection number (16bit value maximum) that was successfully dispensed
Possible answers	
- MMCSLS<X>NOSESSION	- You will receive this answer if you are trying to send ca vend success in a stage that is not expecting this command
- MMCSLS<X>VNDSUCCOK	- If the interface successfully received and parsed the command.
- MMCSLS<X>VNDSUCCFAIL	- If the interface was not able to successfully receive and parse the command.

8. Report a vend failure to the cashless device

Command	
MMCSLS<X>VNDFAIL	This command will report a vend failure to the cashless device. Usually, the cashless device must restore funds to the customer’s account.
Possible answers	
- MMCSLS<X>NOSESSION	- You will receive this answer if you are trying to send ca vend failure in a stage that is not expecting this command
- MMCSLS<X>VNDFAILOK	- If the interface successfully received and parsed the command.
- MMCSLS<X>VNDFAILFAIL	- If the interface was not able to successfully receive and parse the command.

9. Report a cash sale to the cashless device

Command	
MMCSLS<X>CASHSALE(A,B)	This command will report a cash sale to the cashless device. This is used for statistic purposes and not all cashless devices may recognize this command. You should test with the cashless device prior to use that. - A is the scaled price (16bit value maximum) - B is the item ID/selection number (16bit value maximum)
Possible answers	
- MMCSLS<X>NOCASHSALESUPPORT	- You will receive this answer if you are trying to send a cashless cash sale command, but the cashless device is not supporting this sale subcommand.
- MMCSLS<X>CASHSALEOK	- If the interface successfully received and parsed the command.
- MMCSLS<X>CASHSALEFAIL	- If the interface was not able to successfully receive and parse the command.

10. Send a revalue request (the customer’s account amount refill)

Command	
MMCSLS<X>REVALREQ(A)	This command will add some amount to customer’s account. - A is the scaled amount your application needs to add to customer’s account (16bit value maximum)
Possible answers	
- MMCSLS<X>NOREVALSUPPORT	- You will receive this answer if you are trying to send a cashless revalue command, but the cashless device is not supporting revalue (is not able to load the amount to the customer’s account)
- MMCSLS<X>NOSESSION	- If there is no cashless session opened, the cashless device will not be able to load any amount to customer’s account.
- MMCSLS<X>REVALOVER	- The specified amount exceeds the cashless maximum revalue capacity for the current session.
- MMCSLS<X>REVALREQOK	- If the interface successfully received and parsed the command.
- MMCSLS<X>REVALREQFAIL	- If the interface was not able to successfully receive and parse the command.

11. Get last 10 cashless device codes

Command	
MMCSLS<X>STATUS?	This command will ask for the last 10 cashless device status codes. You application can use this to periodically ask the cashless device status, if it missed some unsolicited messages.
Possible answers	
- MMCSLS<X>STATUS(A,B,C,D,E,F,G,H,I,J)	- A to J are some byte values, corresponding with the cashless device status bytes received on cashless poll. You need to check with MDB documentation for the bytes interpretation. For example, 8 means “cashbox removed”. This vector is a FIFO loop and you may need to read it periodically.

12. Check if the cashless device was initialized by the interface

Command	
MMCSLS<X>INITED?	This command will check if the cashless device was initialized by the interface after power-up or after issuing CSLSRESET command
Possible answers	
- MMCSLS<X>INITEDOK - MMCSLS<X>NOTINITED	- The cashless device was successfully initialized - The cashless device was not initialized (missing or not initialized, yet).

13. Check if the cashless device was enabled

Command	
MMCSLS<X>ACTIVE?	This command will check if the cashless was previously activated by a CSLSENABLE.
Possible answers	
- MMCSLS<X>ACTIVEOK - MMCSLS<X>NOTACTIVE	- The cashless device is currently enabled - The cashless device is not currently enabled

14. Get the cashless device information

Command	
MMCSLS<X>INFOREQ?	This command will read the cashless device information for statistics and payment systems inventory tracking. This information is read during automatic coin acceptor/changer initialization phase, after a power-up or after issuing CSLSRESET command.
Possible answers	
- MMCSLS<X>INFOREQ(A,B,C)	- A is the cashless device manufacturer code, fixed length – 3 characters (ASCII) - B is the cashless device internal serial number, fixed length, 12 characters (ASCII) - C is the cashless device internal model number, fixed length, 12 characters (ASCII)
- MMCSLS<X>NOTINITED	- The cashless device was not previously initialized and the information is not available

15. Get the cashless device settings

Command	
MMCSLS<X>SETTINGS?	This command will read the cashless device settings. This information is read during automatic cashless device initialization phase, after a power-up or after issuing CSLSRESET command.
Possible answers	
- MMCSLS<X>SETTINGS(A,B,C,D,E,F)	- A is the cashless device feature level (decimal) - B is the cashless device country code (HEX) - C is the cashless device scaling factor (decimal) - D is the cashless device decimal places (decimal) - E is the cashless device maximum application time (decimal) - F is the cashless device option bits as described in the MDB specifications: - b0 – if set, the payment media is able to accept revalue command; - b1 – if set, the cashless device is multivend capable; - b2 – if set, the cashless device has it's own display; - b3 – if set, the cashless device is supporting cash sale reporting
- MMCSLS<X>NOTINITED	- The bill cashless device was not previously initialized and the information is not available

15. Cashless session complete

Command	
MMCSLS<X>SESSCOMPLETE?	This command will force closing current cashless session. For multivend cashless devices there is no effect, since they will immediately begin a new session if the media support still inserted. Usually if the cashless device is configured with single vend option, it will automatically close the current session right after settlement. Still there are some poorly implemented cashless devices on the market that may require this command. CSLS<x>RESET can be also used as a workaround for those cashless device that are not automatically request session closing.
Possible answers	
- MMCSLS<X>SESSCOMPLETEOK - MMCSLS<X>SESSCOMPLETEFAIL	- Command successfully sent - Command could not be sent

E. Interface (VMC) system related commands

1. Get VMC settings

Command	
MMVMCSETTINGS?	This command will read interface internal settings.
Possible answers	
- MMVMCSETTINGS(A,B,C,D)	- A is the VMC configured feature level (this interface can only work as a Level 2 and level 3 VMC) - B is number of characters on display/columns (maximum 16). If this value is set to 0, the VMC will inform cashless devices that it is not supporting display messages. - C is the number of rows on display - D is the display type, according to MDB specifications, cashless display message section.

2. Set VMC settings

Command	
- MMVMCSETTINGS(A,B,C,D)	This command will set interface internal settings - A is the VMC configured feature level (this interface can only work as a Level 2 and level 3 VMC) - B is number of characters on display/columns (maximum 16). If this value is set to 0, the VMC will inform cashless devices that it is not supporting display messages. - C is the number of rows on display - D is the display type, according to MDB specifications, cashless display message section.
Possible answers	
- MMFTLVLERROR - MMVMCSETTINGSOK	- The VMC feature level you mentioned in parameters is invalid. - Command correctly received and parsed.

3. Set VMC manufacturer code

Command	
- MMVMCSETMFCODE(AAA)	This command will set interface internal manufacturer code that it is reporting to cashless device during automated initialization phase. - AAA is a fixed length, 3 characters (ASCII) value
Possible answers	
- MMVMCSETMFCODEERR1 - MMVMCSETMFCODEOK	- The VMC manufacturer code length you mentioned as a parameter is invalid. - Command correctly received and parsed.

4. Set VMC internal serial number

Command	
- MMVMCSETSN(AAAAAAAAAAAA)	This command will set interface internal serial number that it is reporting to cashless device during automated initialization phase. - AAAAAAAAAAAA is a fixed length, 12 characters (ASCII) value
Possible answers	
- MMVMCSETSNERR1 - MMVMCSETSNOK	- The VMC interface serial number length you mentioned as a parameter is invalid. - Command correctly received and parsed.

5. Set VMC internal model number

Command	
- MMVMCSETMN(AAAAAAAAAAAA)	This command will set interface internal model number that it is reporting to cashless device during automated initialization phase. - AAAAAAAAAAAA is a fixed length, 12 characters (ASCII) value
Possible answers	
- MMVMCSETMNERR1 - MMVMCSETMNOK	- The VMC interface model number length you mentioned as a parameter is invalid. - Command correctly received and parsed.

6. Read the last error

Command	
- MMLASTERROR?	This command will read the last error value. You can use this command to obtain some additional error codes after a command fails. You can find details about last error codes in the Appendix I, II and III
Possible answers	
- MMLASTERROR(ERR_CODE)	- The interface will return last known error code.

7. Clear the last error

Command	
- MMCLEARLASTERROR	This command will clear the last error value. You may use this to clear last error code variable in order to keep it up to date. After issuing this command, the LASTERROR? command will read LASTERROR(NOERR).
Possible answers	
- MMCLEARLASTERROROK	- The interface correctly received and parsed the command.

8. Reset interface internal counters

Command	
- MMCOUNTERSRESET	This command will clear all internal counters. The interface will automatically reboot 3 seconds after issuing this command. You need to reactivate your payment systems if required.
Possible answers	
- MMCOUNTERSRESETOK - MMCOUNTERSRESETFAIL	- The interface correctly received and executed the command. - The interface failed executing this command.

9. Interface reboot

Command	
- MMSYSRESET	This command will force interface reboot after 3 seconds.
Possible answers	
- MMSYSRESETOK	- The interface correctly received and parsed the command.

10. Check if the interface is up and running

Command	
- MMALIVE?	This command will request a simple ACK response from the interface, in order to check it is normally working.
Possible answers	
- MMALIVEACK	- The interface correctly received the message and is running.

11. Read internal counters

Command	
- MMCNTR?	This command will read interface's internal counters. Counters are automatically incremented on some events (bill validated, coin accepted, bill rejected, coin rejected, etc.)
Possible answers	
- MMCNTR(A,B,C,D,E,F,G,H,I,J,K,L,M)	- A is the total number of received bills. - B is the total value of received bills. - C is not used in this version. - D is the total number of rejected bills (you can monitor this counter in order to decide when you need to clean/recalibrate the bill validator). - E is the total number of received coins. - F is the total value of received coins. - G is the total number of cashless transactions. - H is the total value of the cashless transactions. - I is not used in this version. - J is the total number of received tokens. - K is the total number of rejected coins. - L is the total value of received tokens. - M is the total number of dispensed tokens (if used with ccTalk hoppers)

12. Save settings

Command	
- MMSAVESETTINGS	This command will save modified settings to the non-volatile memory. You must use this command after you modify at least one of the interface settings.
Possible answers	
- MMSAVESETTINGSOK - MMSAVESETTINGSFAIL	- If the interface successfully saved the settings to the non-volatile memory. - If the interface failed to save settings to non-volatile memory.

13. Load settings

Command	
- MMLOADSETTINGS	This command will force loading settings. It is also automatically executed on power-up.
Possible answers	
- MMLOADSETTINGSOK - MMDEFAULTSETTINGS - MMLOADSETTINGSFAIL	- If the interface failed to save settings to non-volatile memory. This command will return the results of the following commands, together: - MMVMCSETTINGS? - MMVMCINFOREQ? - MMRECYCLERSETBILLS? - MMTOKENVALUES? Also, it will return MMVMCSWVER(A,B) – the internal software version, major an minor release - If the settings file is not available. - If the settings file could not be read.

14. Factory reset

Command	
- MMFACTORYRESET	This command will force a complete erasure of all settings and parameters. The interface will reboot after 3 seconds and will load the default (factory) settings. This will only reset master settings, counters and working mode. It will not reset cashless settings. To reset cashless settings, use SSFACTORYRESET command
Possible answers	
- MMFACTORYRESETOK - MMFACTORYRESETFAIL	- If the command was successfully received and executed. - If the command was not successfully received and executed.

15. Set interface working mode

Command	
- MMWORKINGMODE(X)	This command will set the interface working mode: - X = 0 – cashless (slave) mode - X = 1 – master mode - X = 2 – combo mode (cashless and master are both active). The interface reboots after successfully executed this command.
Possible answers	
- MMWORKINGMODEOK - MMWORKINGMODEFAIL	- If the command was successfully received and executed. - If the command was not successfully received and executed.

16. Get interface working mode

Command	
- MMWORKINGMODE?	This command will return the current interface working mode
Possible answers	
- MMWORKINGMODE(CASHLESS) - MMWORKINGMODE(MASTER) - MMWORKINGMODE(BRIDGE)	- The interface is working in slave (cashless) mode - The interface is working in master mode - The interface is working in combo mode (both master and cashless functions are activate).

17. Get interface serial number

Command	
- MMSNREAD?	This command will return the unique interface serial number. Useful if your application needs to be locked to work with a specific device.
Possible answers	
- MMSNREAD(000000000000)	- The interface serial number

F. Relay related commands

This set of commands is working only when an optional PICOVEND EZ ESP 8X slave relay board is connected on the MDB interface of PICOVEND EZ MDB BRIDGE interface. Please check the optional PICOVEND EZ ESP 8X board manual for it's usage/specifications. Mainly, this board is used to control up to 8 external circuits, being equipped with 8 relays. It can receive relay control commands over USB or over MDB (being an MDB slave device). Each relay can be addressed individually, or you can address all relays at one time, and each relay can be energized for a desired amount of time, between 1 and 65535 seconds. Up to 8 relay boards can be controlled by this interface (a total of 64 relays).

1. Individual relay control

Command	
- MMRELAY(A,B,C)	This command will energize one relay for a specified amount of time. - A – is the relay board module address, set by MYADDRESS command over USB and saved with SAVESETTINGS command after. - B – is the relay number (1-8) - C – is the time for the relay to be energized, in seconds (1-65535). The board will automatically de-energize the relay after the specified time passed. To force the relay de-energize at any moment, you need to specify 0 for this parameter Example: **MMRELAY(1,3,45)** – will energize the relay number 3 (OUT3 on the board) for a specified time of 45 seconds
Possible answers	
- MMRELAYOK - MMRELAYFAIL	- If the command was successfully received and executed. - If the command was not successfully received and executed.

2. Batch relay control

Command	
- MMRELAYALL(A,B,C,D,E,F,G,H,I)	This command will energize/de-energize all slave board relays with a single command - A – is the relay board module address, set by MYADDRESS command over USB and saved with SAVESETTINGS command after. - B-I – is the time for relay 1-8 (OUT1-OUT8). The board will automatically de-energize the relays after the specified time passed. To force the relay de-energize at any moment, you need to specify 0 for the parameter on the desired relays. Example: **MMRELAYALL(1,10,60,0,0,0,0,0,0) –** will energize OUT1 relay for 10 seconds and OUT2 relay for 60 seconds, all the other relays will be de-energized.
Possible answers	
- MMRELAYALLOK - MMRELAYALLFAIL	- If the command was successfully received and executed. - If the command was not successfully received and executed.

3. Check relay status

Command	
- MMRELAYSTATUS(A)	This command will check the relays status and will return the time that each relay will be still energized. You can use this command to check if some of the relays are energized and for how long. - A is the relay board module address, set by MYADDRESS command over USB and saved with SAVESETTINGS command after.
Possible answers	
- MMRELAYSTATUS(A,B,C,D,E,F,G,H,I)	- If the command was successfully received and executed. - A is the relay board module address, set by MYADDRESS command over USB and saved with SAVESETTINGS command after. - B-I – is the time in seconds that relays (OUT1-OUT8) will be still energized. If the returned value is 0, the corresponding relay is de-energized.
- MMRELAYASTATUSFAIL	- If the command was not successfully received and executed.

4. Relay reset

Command	
- MMRELAYRESET(A)	This command will reset all relays time to 0 and de-energize them - A - is the relay board module address, set by MYADDRESS command over USB and saved with SAVESETTINGS command after.
Possible answers	
- MMRELAYRESETOK	- If the command was successfully received and executed.
- MMRELAYRESETFAIL	- If the command was not successfully received and executed.

IV. Master related unsolicited messages

Unsolicited messages are messages that are coming as a result of the payment systems activity and not as a result of a command from your application. They may occur at any moment so your application is responsible to constantly listen on the serial or USB interface, parse unsolicited messages and react accordingly.

1. Power-up messages

Those messages may be sent on interface power-up or reboot (MMSYSRESET command)

Message	Description
MDBMASTERSTART	- This message comes out on power-up
INITFSOK(A,B,C)	- A is the file system initialization mode - B is the file system used bytes - C is the file system total capacity (bytes)
CNTRINIT	- This message only occurs after using MMCOUNTERSRESET command
MMCNTR(A,B,C,D,E,F,G,H,I,J,K,L)	- It is the counters vector, please check on MMCNTR? command for details.
MMVMCSETTINGS(A,B,C,D)	- It is the VMC settings vector, please check on MMVMCSETTINGS? command for details.
MMVMCINFOREQ(A,B,C)	- It is the VMC info vector, please check on MMVMCINFOREQ? command for details
MMVMCSWVER(A,B)	- It is the interface software version, A is the major release version and B is the minor release version
MMRECYCLERSETBILLS(A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P)	- It is the recycler info vector, please check MMRECYCLERSETBILLS? command for details
MMTOKENVALUES(A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P)	- It is the tokens velues vector, please check MMTOKENVALUES? command for details
MMCNTRWRERR	- May appear on boot after using MMCOUNTERSRESET command, if the counters file could not be initialized. This is a fatal error and the device will not work properly.
MMCNTRRDERR	- May appear on boot if the counters file is corrupted. You may try to use MMCOUNTERSRESET and a reboot to create a fresh counters file
MMLOADSETTINGSOK	- This ends the configuration auto loading messages batch

2. Bill validator just reset time exceeded

Message	Description
MMBILLJRESETEXCEED	- The interface failed waiting for reset message from the bill validator. It will automatically reset all validator related variables and start sending bill reset message.

3. Bill validator setup time exceeded

Message	Description
MMBILLSETUPEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL SETUP command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

4. Bill validator expansion ID time exceeded

Message	Description
MMBILLEXPIDEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL EXPANSION ID command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

5. Bill validator expansion ID with options time exceeded

Message	Description
MMBILLEXPIDOPTEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL EXPANSION ID WITH OPTIONS command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

6. Bill validator optional feature enable time exceeded

Message	Description
MMBILLENOPTFEATEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL OPTIONAL FEATURES ENABLE command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

7. Bill validator with recycling support has been identified

Message	Description
MMBILLHASRECYCLER	- The interface identified a bill validator with recycling support during bill initialization phase.

8. Interface will try to enable the recycling support

Message	Description
MMBILLTRYENRECYCLER	- The interface will perform needed operations in order to enable bill recycling support for the bill validator/recycler

9. Bill recycler setup time exceeded

Message	Description
MMBILLRECYCLERSETUPEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL RECYCLER SETUP command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

10. Bill device has no support to recycler any known bills

Message	Description
MMBILLNOAVAILRECYCLINGBILLS	- The bill validator does not support recycling for any of the known (configured) bills.

11. Bill recycler enabling time exceeded

Message	Description
MMBILLRECYCLERENEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL RECYCLER ENABLED command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

12. Bill recycler enabling failed

Message	Description
MMBILLRECYCLERENFAIL	- The interface failed to enable the bill recycler functions.

13. Bill recycler function successfully enabled

Message	Description
MMBILLRECYCLERONOK	- The interface failed to enable the bill recycler functions.

14. Bill recycler answered with a NAK on enable function

Message	Description
MMBILLRECYCLERENACK	- The interface received a NAK while trying to enable bill recycler functions. It will retry until the bill recyler will correctly answer or until the retry time exceed.

15. Bill recycler reading dispense status time exceeded

Message	Description
MMBILLDISPENSESTATEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL RECYCLER DISPENSE STATUS command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

16. Bill recycler reading dispense status returned a NAK

Message	Description
MMBILLDISPENSESTATNAK	- The interface received a NAK while trying to obtain a dispense status. It will retry until the bill recycler will correctly answer or until the retry time exceed.

17. Bill recycler reading dispense status returned an ACK

Message	Description
MMBILLDISPENSESTATACK	- The interface received a simple ACK while trying to obtain a dispense status. It will retry until the bill recycler will correctly answer or until the retry time exceed.

18. Bill recycler reading dispense status returned an ACK

Message	Description
MMBILLDISPENSESTATACK	- The interface received a simple ACK while trying to obtain a dispense status. It will retry until the bill recycler will correctly answer or until the retry time exceed.

19. Bill recycler remaining stock value

Message	Description
MMRECYCLERSTOCKVALUE(X)	- X is the scaled total bills value remaining for recycling after the bill recycler finished dispensing bills.

20. Bill dispensing command time exceed

Message	Description
MMBILLDISPENSEVALUEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL RECYCLER DISPENSE command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

21. Bill dispensing command time exceed

Message	Description
MMBILLDISPENSETOTAL(X)	- X is the scaled total value of the bills to dispense

22. Bill dispensing command time exceed

Message	Description
MMBILLDISPENSED(X)	- X is the scaled total value of the dispensed bills.

23. Bill stacker status command time exceeded

Message	Description
MMBILLSTACKEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL STACKER command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

24. Bill stacker status – stacker full

Message	Description
MMBILLSTACKFULL(X)	- X is the number of the bills in the bill validator stacker and the stacker is reported full.

25. Bill stacker status – stacker not full

Message	Description
MMBILLSTACKNOTFULL(X)	- X is the number of the bills in the bill validator stacker and the stacker is not full, yet.

26. Bill is not ready

Message	Description
MMBILLNOTREADY	- Bill validator/recycler is not ready to execute the last received command, probably because it was not initialized, enabled or it’s current status does not allow this command.

27. Bill validator/recycler failed to answer on poll command

Message	Description
MMBILLPOLLEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB BILL POLL command. It will automatically restore all validator related variables and start sending bill reset message to retry the bill initialization operation.

28. Bill validator – one bill stacked

Message	Description
MMBILLSTACKED(A,B,C)	- One bill was successfully stacked - A is the scaled value of the last stacked bill - B is the number of total stacked bill (internal non-volatile counter) - C is the total value of the stacked bills (internal non-volatile counter)

29. Bill in escrow position

Message	Description
MMBILLESCROW(X)	- One bill is in the escrow position - X is the scaled value of the bill in escrow position. Your application should send a BILLACCEPT or a BILLREJECT command on this stage, depending on it's flow, maximum credit, etc

30. Bill returned to customer

Message	Description
MMBILLRETURNED(X)	- The bill in escrow position returned to customer - X is the scaled value of the returned bill.

31. Bill received in recycler

Message	Description
MMBILLTORECYCLER(X)	- A bill was received and stored in the recycling box - X is the scaled value of the stored bill.

32. A disabled bill was rejected

Message	Description
MMBILLDISREJ(X)	- A bill was rejected because it was previously disabled by the user application. - X is the scaled value of the rejected bill.

33. A bill was manually loaded to recycler

Message	Description
MMBILLRECMANFILL(X)	- A bill manually loaded to recycler stock - X is the scaled value of the loaded bill.

34. A disabled bill was manually dispensed from the recycler

Message	Description
MMBILLMANDISP(X)	- A bill was manually dispensed from the recycler - X is the scaled value of the dispensed bill.

35. A disabled bill was transferred from the recycler to cashbox

Message	Description
MMBILLTRANSFER(X)	- A bill was transferred from the recycler box to the cashbox - X is the scaled value of the transferred bill.

36. Bill validator is in normal condition

Message	Description
MMBILLOK	- Bill was correctly initialized after reset or has been recovered after an error.

37. Bill validator have a defective motor

Message	Description
MMBILLDEFMOTOR	- Bill validator encountered one of it’s motors failure

38. Bill validator have a defective sensor

Message	Description
MMBILLSENSORFAIL	- Bill validator encountered one of it’s sensors failure

39. Bill validator is busy

Message	Description
MMBILLBUSY	- Bill validator is in a busy state doing something

40. Bill validator ROM error

Message	Description
MMBILLROMERROR	- Bill validator encountered an internal ROM error

40. Bill validator jam

Message	Description
MMBILLJAM	- Bill validator encountered a bill jam error

41. Bill validator was reset

Message	Description
MMBILLRESET	- Bill validator has just been reset.

42. Bill removed from bill validator

Message	Description
MMBILLREMOVED	- A bill was removed from the bill validator

43. Bill validaor cashbox has been removed

Message	Description
MMBILLCSBOXREMOVED	- Bill validator’s cashbox has been removed

44. Bill validaor has been disabled by your application or by an internal error

Message	Description
MMBILLDISABLED	- Bill validator has been disabled by your application or due an internal error

45. Bill validator has been rejected a bill

Message	Description
MMBILLREJECTED(X)	- Bill validator has been rejected a bill - X is the total number of rejected bills.

46. Bill removed after it was credited

Message	Description
MMBILLCREDITEDREMOVED	- A bill was removed from the bill validator after it was credited.

47. A bill was inserted while the bill validator is deactivated

Message	Description
MMBILLINSERTWHILEDISABLED	- A bill was inserted while the bill validator is deactivated

48. Recycler has received a change request

Message	Description
MMRECYCLERCHGREQUEST	- Recycler has received a change request

49. Cash sale reported to the cashless device

Message	Description
MMCSLS<X>CASHSALE(A,B)	- Cash sale was reported to the cashless device - A is the item price - B is the item ID/selection number

50. Cash sale successfully reported to the cashless device

Message	Description
MMCSLS<X>CASHSALEOK	- A cash sale was successfully reported to the cashless device.

51. Cash sale reporting to the cashless device failed

Message	Description
MMCSLS<X>CASHSALEFAIL	- A cash sale reporting to the cashless device failed.

52. Cashless device setup time exceeded

Message	Description
MMCSLS<X>SETUPEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB CASHLESS SETUP command. It will automatically restore all cashless device related variables and start sending cashless reset message to retry the cashless device initialization operation.

53. Cashless device max/min prices reporting time exceed

Message	Description
MMCSLS<X>MAXMINEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB MAX/MIN PRICES command. It will automatically restore all cashless device related variables and start sending cashless reset message to retry the cashless device initialization operation.

54. Cashless device poll time exceed

Message	Description
MMCSLS<X>POLLEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB CASHLESS POLL command. It will automatically restore all cashless device related variables and start sending cashless reset message to retry the cashless device initialization operation.

55. Cashless device expansion request ID time exceed

Message	Description
MMCSLS<X>EXPREQIDEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB CASHLESS REQUST ID command. It will automatically restore all cashless device related variables and start sending cashless reset message to retry the cashless device initialization operation.

56. Cashless device expansion enable options time exceed

Message	Description
MMCSLS<X>EXPENOPTEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB CASHLESS EXPANSION ENABLE OPTIONS command. It will automatically restore all cashless device related variables and start sending cashless reset message to retry the cashless device initialization operation.

57. Cashless device have Always Idle support and it will be enabled

Message	Description
MMCSLS<X>ALWAYSIDLE	- The cashless device have Always Idle support and the interface will try to enable it

58. Cashless device writing date/time exceed

Message	Description
MMCSLS<X>WRDTEXCEED	- The interface repeatedly failed to receive a valid answer on the MDB DATE/TIME command. It will automatically restore all cashless device related variables and start sending cashless reset message to retry the cashless device initialization operation.

59. Cashless device sent a display message

Message	Description
MMCSLS<X>DISPMSG(A,B)	- The cashless device sent a display message to the interface - A is the time to keep message on display (A x 0.1sec) - B is the message to display

60. Cashless device sent a BEGIN SESSION message

Message	Description
MMCSLS<X>BEGIN(A,B,C)	- The cashless device sent a BEGIN SESSION message to the interface - A is the scaled available credit value - B is the media ID (for example, the card serial number) - C is the media type

61. Cashless device sent a VEND APPROVED message

Message	Description
MMCSLS<X>VNDAPP(A,B,C)	- The cashless device sent a VEND APPROVED message to the interface - A is the scaled approved value - B is the total number of cashless transactions (internal counter) - C the total scaled value of cashless transactions (internal counter)

62. Cashless device sent a VEND DENIED message

Message	Description
MMCSLS<X>VNDDEN	- The cashless device sent a VEND DENIED message to the interface

63. Cashless device sent an END SESSION message

Message	Description
MMCSLS<X>ENDSESSION	- The cashless device sent an END SESSION message to the interface

64. Cashless device sent a CANCELED message

Message	Description
MMCSLS<X>CANCELED	- The cashless device sent a CANCELED message to the interface

65. Cashless device is ready

Message	Description
MMCSLS<X>READY	- The cashless device was correctly initialized and is ready to be enabled.

66. Cashless device returned a malfunction error

Message	Description
MMCSLS<X>MALFUNCTION(X)	- The cashless device returned a malfunction message - X is the internal malfunction code, it’s value depends on the cashless device and you can find more information in it’s manual

67. Cashless device returned COMMAND OUT OF SEQUENCE message

Message	Description
MMCSLS<X>CMDOUTOFSEQ	- The cashless device returned a COMMAND OUT OF SEQUENCE message

68. Cashless device sent a REVALUE APPROVED message

Message	Description
MMCSLS<X>REVALAPP	- The cashless device returned a REVALUE APPROVED message

69. Cashless device sent a REVALUE DENIED message

Message	Description
MMCSLS<X>REVALDEN	- The cashless device returned a REVALUE DENIED message

70. Cashless device sent a REVALUE LIMIT message

Message	Description
MMCSLS<X>REVALLIMIT(X)	- The cashless device returned a REVALUE LIMT message - X is the maximum amount it will accept for the next REVALUE REQUEST command

71. Cashless device sent a DATE/TIME request message

Message	Description
MMCSLS<X>DTREQ	- The cashless device is requesting a date/time command to synchronize it internal RTC

72. Interface successfully sent date/time command to the cashless device

Message	Description
MMCSLS<X>DTSENDOK	- The interface successfully sent date/time command to the cashless device.

73. Interface failed sending date/time command to the cashless device

Message	Description
MMCSLS<X>DTSENDFAIL	- The interface failed sending date/time command to the cashless device.

74. Interface successfully enabled the cashless device

Message	Description
MMCSLS<X>ENABLED	- The interface successfully enabled the cashless device.

75. Interface successfully enabled the cashless device

Message	Description
MMCSLS<X>ENABLED	- The interface successfully enabled the cashless device.

76. Coin acceptor/changer just reset waiting time exceeded

Message	Description
MMCOINJUSTRESETEXCEED	- The interface repeatedly failed to receive a valid answer on waiting for JUST RESET message. It will automatically restore all coin acceptor/changer related variables and start sending coin reset message to retry the coin acceptor/changer initialization operation.

77. Coin acceptor/changer setup time exceeded

Message	Description
MMCOINSETUPEXCEED	- The interface repeatedly failed to receive a valid answer on COIN SETUP command. It will automatically restore all coin acceptor/changer related variables and start sending coin reset message to retry the coin acceptor/changer initialization operation.

78. Coin acceptor/changer expansion identification time exceeded

Message	Description
MMCOINEXPIDEXCEED	- The interface repeatedly failed to receive a valid answer on COIN EXPANSION IDENTIFICATION command. It will automatically restore all coin acceptor/changer related variables and start sending coin reset message to retry the coin acceptor/changer initialization operation.

79. Coin acceptor/changer feature enable time exceeded

Message	Description
MMCOINFTENABLEEXCEED	- The interface repeatedly failed to receive a valid answer on COIN FEATURE ENABLE command. It will automatically restore all coin acceptor/changer related variables and start sending coin reset message to retry the coin acceptor/changer initialization operation.

80. Coin acceptor/changer tube status time exceeded

Message	Description
MMCOINTBSTATEXCEED	- The interface repeatedly failed to receive a valid answer on COIN TUBE STATUS command. It will automatically restore all coin acceptor/changer related variables and start sending coin reset message to retry the coin acceptor/changer initialization operation.

81. Coin acceptor/changer is not ready for the issued command

Message	Description
MMCOINNOTREADY	- The coin acceptor/changer is not ready to execute the last issued command

82. Coin acceptor/changer tube status

Message	Description
MMCOINTBSTATUS(X)	- The coin acceptor/changer returned the TUBE STATUS answer. - X is the total scaled value of the coins available for change. If the number of coins in a tube is bigger than 255, the coin changer will return 255 as a value for that tube. So, this command is not appropriate for coins stock management since it will return the same value for a tube until the number of coins in that tube falls below 255. But you can use it to set an alarm on lower coins stock, for example.

83. Coin acceptor/changer poll time exceeded

Message	Description
MMCOINPOLLEXCEED	- The interface repeatedly failed to receive a valid answer on COIN POLL command. It will automatically restore all coin acceptor/changer related variables and start sending coin reset message to retry the coin acceptor/changer initialization operation.

84. Coin acceptor/changer is busy dispensing coins

Message	Description
MMCOINPAYBUSY	- The coin acceptor/changer is busy dispensing coins following a MMCOINDISPENSE or a MMCOINAP command. This message will occur repeatedly until the coin changer finish the dispense operation. The number of those messages depends on the number of the coins it should dispense and the dispensing method (MMCOINAP method is faster than MMCOINDISPENSE).

85. Coin acceptor/changer temporarily unable to dispense coins

Message	Description
MMCOINCHGNOTNOW	- The coin acceptor/changer is temporarily unable to dispense coins due to it’s working stage. Your application should retry later.

86. Coin acceptor/changer has failed to dispense all or some of the required coins

Message	Description
MMCHANGEREMAINING(X)	- The coin acceptor/changer has failed to dispense all or some of the required coins. - X is the scaled value of the coins changer was unable to dispense for some reasons. You will use this value to display the remaining credit to the customer.

87. Coin acceptor/changer is reporting a manual coin dispense

Message	Description
MMCOINMANDISP(A,B,C)	- The coin changer has manually dispensed one or more coins (usually by pressing one or more buttons on it’s front panel). - A is the scaled coin type value - B is the total number of manually dispensed coins - C is the total number of coins remaining in tubes for the A type value

88. Coin acceptor/changer received a token

Message	Description
TOKENIN(A,B,C,D)	- One token has been received by the coin acceptor/changer - A is the token value (you need to set the token values correctly on the interface settings section) - B is the token routing (0 – to cashbox, 1 – to tubes, 3 - rejected) - C is the total number of received tokens (lifetime internal counter) - D is the total value of received tokens (lifetime internal counter)

89. Coin acceptor/changer received a coin

Message	Description
MMCOININ(A,B,C,D,E)	- One coin has been received by the coin acceptor/changer - A is the scaled coin value - B is the token routing (0 – to cashbox, 1 – to tubes, 3 – rejected) - C is the total number of coins with the same value available in tubes - D is the total number of received coins (lifetime internal counter) - E is the total value of received coins (lifetime internal counter)

90. Coin acceptor/changer detected a slug

Message	Description
MMCOINSLUG(A,B)	- One slug detected by the coin acceptor/changer - A is the slug counter, reported by the coin acceptor/changer - B is the total number of coins/tokens rejected by the coin acceptor/changer (lifetime internal counter)

91. Coin acceptor/changer is in normal condition

Message	Description
MMCOINOK	- Coin was correctly initialized after reset or has been recovered after an error.

92. Coin acceptor/changer received a change request

Message	Description
MMCOINCHGREQ	- Coin acceptor/changer has received a change request (usually by pressing the coin changer mechanical lever). Customer pressed the change lever in order to cancel the transaction or request the change after transaction. Your application should act accordingly.

93. Coin acceptor/changer received a coin that was not credited

Message	Description
MMCOINNOTCRDT	- Coin acceptor/changer received a coin that was routed, but not credited.

94. Coin acceptor/changer has a defective tube sensor

Message	Description
MMCOINDEFTBSENSOR	- Coin acceptor/changer detected a defective tube sensor.

95. Coin acceptor/changer detected a double arrival

Message	Description
MMCOINDBLARRIVAL	- Coin acceptor/changer detected a double arrival (two or more coins/tokens were inserted too fast in order to allow the coin acceptor to validate them).

96. Coin changer detected an acceptor disconnection

Message	Description
MMCOINACCUNPL	- Coin changer detected an acceptor disconnection.

97. Coin acceptor/changer detected a tube jam

Message	Description
MMCOINTBJAM	- Coin acceptor/changer detected a tube jam

98. Coin acceptor/changer detected an internal ROM error

Message	Description
MMCOINROMERR	- Coin acceptor/changer detected an internal ROM error

99. Coin acceptor/changer detected a routing error

Message	Description
MMCOINROUTERR	- Coin acceptor/changer detected a routing error for the last accepted coin/token

100. Coin acceptor/changer detected reset condition

Message	Description
MMCOINRST	- Coin acceptor/changer detected a reset condition

101. Coin acceptor/changer detected a coin jam

Message	Description
MMCOINJAM	- Coin acceptor/changer detected a coin jam, most probably in the flight deck area. Your application can indicate the customer to press the escrow lever in order to release the blocked coins

102. Coin acceptor/changer detected the removal of a credited coin

Message	Description
MMCOINCRREM	- Coin acceptor/changer detected the rmoval of a credited coin.

Master appendix I – Bill related LAST ERROR messages

Those are the codes you can read using LASTERROR? command after the interface has been returned a bill validator/recycler related error or fail message

CODE	DESCRIPTION
ERRB001	No answer on bill reset
ERRB002	NAK on bill reset
ERRB003	Unknown answer on bill reset
ERRB004	CRC error on bill reset
ERRB005	Unknown error on bill reset
ERRB006	No answer while polling bill for JUST RESET
ERRB007	NAK while polling bill for JUST RESET
ERRB008	Unknown answer on polling bill for JUST RESET
ERRB009	CRC error on polling bill for JUST RESET
ERRB010	No answer on bill SETUP
ERRB011	Bill answer length error on bill SETUP
ERRB012	CRC error on bill SETUP
ERRB013	No answer on bill EXPANSION IDENTIFICATION
ERRB014	Bill answer length error on bill EXPANSION IDENTIFICATOIN COIN
ERRB015	CRC error on bill EXPANSION IDENTIFICATION
ERRB016	No answer on bill EXPANSION IDENTIFICATION with options
ERRB017	Bill answer length error on bill EXPANSION IDENTIFICATOIN with options
ERRB018	CRC error on bill EXPANSION IDENTIFICATION with options
ERRB019	No answer on bill FEATURE ENABLE
ERRB020	NAK on bill FEATURE ENABLE
ERRB021	CRC error on bill FEATURE ENABLE
ERRB022	No answer on bill RECYCLER SETUP
ERRB023	NAK on bill RECYCLER SETUP
ERRB024	CRC error on bill RECYCLER SETUP
ERRB025	No answer on bill RECYCLER ENABLE
ERRB026	CRC error on bill RECYCLER ENABLE
ERRB027	No answer on bill RECYCLER DISPENSE STATUS
ERRB028	CRC error on bill RECYCLER DISPENSE STATUS
ERRB029	No answer on bill RECYCLER DISPENSE STATUS
ERRB030	CRC error on bill RECYCLER DISPENSE STATUS
ERRB031	No answer on bill DISPENSE VALUE
ERRB032	CRC error on bill RECYCLER ENABLE
ERRB033	No answer on bill PAYOUT VALUE POLL
ERRB034	CRC error on bill PAYOUT VALUE
ERRB035	No answer on bill STACKER

CODE	DESCRIPTION
ERRB036	NAK on bill STACKER
ERRB037	CRC error on bill STAKER
ERRB038	No answer on manual bill STACKER
ERRB039	Incorrect answer length on bill STACKER
ERRB040	CRC error on bill STACKER
ERRB041	No answer on bill POLL
ERRB042	CRC error on bill POLL
ERRB043	No answer on bill ENABLE
ERRB044	NAK on bill ENABLE
ERRB045	Unknown answer on bill ENABLE
ERRB046	CRC error on bill ENABLE
EERB047	Bill not in correct stage for this command
ERRB048	No answer on bill SELECTIVE ENABLE
ERRB049	NAK on bill SELECTIVE ENABLE
ERRB050	Unknown answer on bill SELECTIVE ENABLE
ERRB051	CRC error on bill SELECTIVE ENABLE
ERRB052	No answer on bill DISABLE
ERRB053	NAK on bill DISABLE
ERRB054	Unknown answer on bill DISABLE
ERRB055	CRC error on bill DISABLE
ERRB056	No answer on bill ACCEPT
ERRB057	NAK on bill ACCEPT
ERRB058	Unknown answer on bill ACCEPT
ERRB059	CRC error on bill ACCEPT
ERRB060	No answer on bill REJECT
ERRB061	NAK on bill REJECT
ERRB062	Unknown answer on bill REJECT
ERRB063	CRC error on bill RESET
ERRB064	Bill already enabled
ERRB065	Bill already disabled

Master appendix II – Coin related LAST ERROR messages

Those are the codes you can read using LASTERROR? command after the interface has been returned a coin acceptor/changer related or fail message

CODE	DESCRIPTION
ERRC001	No answer on coin RESET
ERRC002	NAK on coin RESET
ERRC003	Unknown answer on coin RESET
ERRC004	CRC error on coin RESET
ERRC005	No answer polling coin for JUST RESET
ERRC006	NAK on coin polling for JUST RESET
ERRC007	Unknown answer on coin poll for JUST RESET
ERRC008	CRC error on coin poll for JUST RESET
ERRC009	No answer on coin SETU
ERRC010	NAK on coin SETUP
ERRC011	Unknown answer on coin SETUP
ERRC012	CRC error on coin SETU
ERRC013	No answer on coin EXPANSION IDENTIFICATION
ERRC014	NAK on coin EXPANSION IDENTIFICATION
ERRC015	Unknown answer on coin EXPANSION IDENTIFICATION
ERRC016	CRC error on coin EXPANSION IDENTIFICATION
ERRC017	No answer on coin FEATURE ENABLE
ERRC018	NAK on coin FEATURE ENABLE
ERRC019	CRC error on coin FEATURE ENABLE
ERRC020	No answer on coin TUBE STATUS
ERRC021	ACK/NAK only on coin TUBE STATUS
ERRC022	Incorrect answer length on coin TUBE STATUS
ERRC023	CRC error on coin TUBE STATUS
ERRC024	Unknown error on coin TUBE STATUS
ERRC025	No answer on coin TUBE STATUS
ERRC026	ACK/NAK only on coin TUBE STATUS
ERRC027	Incorrect answer length on coin TUBE STATUS
ERRC028	CRC error on coin TUBE STATUS
ERRC029	Unknown error on coin TUBE STATUS
ERRC030	No answer on coin ENABL
ERRC031	NAK on coin ENABLE
ERRC032	Unknown answer on coin ENABLE
ERRC033	CRC error on coin ENABLE
ERRC034	Coin not in correct stage for this command
ERRC035	No answer on coin SELECTIVE ENABLE

CODE	DESCRIPTION
ERRC036	NAK on coin SELECTIVE ENABLE
ERRC037	Unknown answer on coin SELECTIVE ANSWER
ERRC038	CRC error on coin SELECTIVE ANSWER
ERRC039	No answer on COIN DISABLE
ERRC040	NAK on coin DISABLE
ERRC041	Unknown answer on coin DISABLE
ERRC042	CRC error on coin DISABLE
ERRC043	No answer on coin EJECT
ERRC044	NAK on coin EJECT
ERRC045	Unknown answer on coin EJECT
ERRC046	CRC error on coin EJECT
EERB047	No answer on coin AP STATUS
ERRC048	ACK only answer on coin AP STATUS
ERRC049	NAK only answer on coin AP STATUS
ERRC050	Unknown answer on coin AP STATUS
ERRC051	CRC error on coin AP STATUS
ERRC052	No answer on coin AP EJECT
ERRC053	Unknown answer on coin AP EJECT
ERRC054	CRC error on coin AP EJECT
ERRC055	Failed to get tube status on coin AP
ERRC056	Coin already enabled
ERRC057	Coin already disabled

Master appendix III – Cashless related LAST ERROR messages

Those are the codes you can read using LASTERROR? command after the interface has been returned a cashless device related or fail message

CODE	DESCRIPTION
ERRS001	NAK on CASHLESS RESET
ERRS002	CRC ERROR on CASHLESS RESET answer
ERRS003	Unknown error on CASHLESS RESET
ERRS004	No answer on CASHLESS SETUP
ERRS005	Cashless SETUP NAK
ERRS006	CRC error on CASHLESS SETUP
ERRS007	No answer on MAX/MIN prices
ERRS008	NAK on MAX/MIN prices
ERRS009	CRC error on MAX/MIN prices
ERRS010	Cashless not inited or not enabled
ERRS011	No answer on cashless vend request
ERRS012	NAK on vend request
ERRS013	CRC error on answer to vend request
ERRS014	Cashless not inited or not enabled
ERRS015	No answer on vend cancel
ERRS016	NAK on vend cancel
ERRS017	CRC error on response to vend cancel
ERRS018	Cashless not inited or not enabled
ERRS019	No answer on vend success
ERRS020	NAK on vend success
ERRS021	CRC error on vand success
ERRS022	Cashless not inited or not enabled
ERRS023	No answer on cashless vend failure
ERRS024	NAK on vend failure
ERRS025	CRC error on vend failure
ERRS026	Cashless not initer or not enabled
ERRS027	No answer on cashless session complet
ERRS028	NAK on cashless session complete
ERRS029	CRC error on cashless session complete
ERRS030	Cashless not inited or not enabled
ERRS031	No answer on cashless cash sale
ERRS032	NAK on cashless cash sale
ERRS033	CRC error on cashless cash sale

CODE	DESCRIPTION
ERRS034	Cannot disable cashless during session
ERRS035	No answer on cashless disable
ERRS036	Unknown answer on cashless disable
ERRS037	CRC error on cashless disable
ERRS038	No answer on cashless enable
ERRS039	Unknown answer on cashless enable
ERRS040	RC error on cashless enable
ERRS041	Cashless not inited or not enabled
ERRS042	No answer on cashless cancel
ERRS043	NAK error on cashless cance
ERRS044	CRC error on cashless cance
ERRS045	Cashless not inited or not enabled
ERRS046	No answer on cashless revalue request
EERB047	NAK on cashless revalue request
ERRS048	CRC error on cashless revalue request
ERRS049	Cashless not inited or not enabled
ERRS050	No answer on cashless revalue limit request
ERRS051	NAK on cashless revalue limit request
ERRS052	CRC error on cashless revalue limit request
ERRS053	No answer on cashless expansion ID reques
ERRS054	NAK on cashless expansion ID request
ERRS055	CRC error on cashless expansino ID request
ERRS056	No answer on cashless enable options
ERRS057	NAK on cashless enable options
ERRS058	CRC error on cashless enable options
ERRS059	No answer on cashless write time/date
ERRS060	NAK on cashless write time/date
ERRS061	CRC error on cashless write time/date
ERRS062	Cashless already enabled
ERRS063	Cshless already disabled

V. MDB cashless communication protocol

A. Cashless related commands and answers

Commands are case-sensitive and you must use all upper case for a command. No mixed characters accepted. All slave (cashless) related functions have an “SS” prefix.
Answers are always upper case.

1. Begin session

Command	
SSBEGIN(AAA,BBB,CCC,DDD,EEE,FFF)	This command starts a cashless session when needed - AAA is the credit amount to begin a cashless session. This value is scaled by cashless device scaling factor (default 1, a value of 130 means EUR130, for example) Depending on the vending machine MDB implementation, this value can be a “fake” credit that allows the customer to select a product, can be 0 to display a 0.00 credit, but allows the customer to select a product or can be 65535 to allows the customer to select a product, without displaying any credit on the machine. You need to test different options depending on your application flow and machine supported values. - BBB is the media ID (a 32bit integer, in decimal representation). Here you can specify the card ID, user ID, a random number or even 0 if you don’t need to identify the user. - CCC – reserved, always 0 for this version - DDD – reserved, always 0 for this version - EEE – session timeout. This value is representing a time in seconds. After this time, the device will automatically cancel the session if the customer make no product selection. This way, if you are sending a credit to the machine and the customer is giving-up, the credit will be erased automatically from the machine. - FFF – vend approval timeout. This value is representing a time in seconds. After this time, the device will automatically send a vend denied message to the vending machine if you are not approving or denying the vend request. After automatic deny, the interface will also cancel the session automatically. This way, if you application becomes unresponsive and you are not able to follow the transaction flow, the device will automatically cancel the transaction.
Possible answers	
- SSBEGINOK	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll.
- SSBEGINFAIL	- if the command reception failed for some reason.
- SSCSLSISINSESSION	- BEGIN command comes when the device is already in session (as a result of a previous SSBEGIN command, for example). This message is sent by the device before SSBEGINFAIL
- SSCSLSNOTENABLED	- SSBEGIN command failed because the cashless device was not initialized and enabled by the VMC

2. Cancel session

Command	
SSCANCEL	This command cancels the current cashless session and VMC returns to the idle state
Possible answers	
- SSCANCELOK	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll.
- SSCANCELFAIL	- if the command reception failed for some reason.
- SSCSLSWAITVND	- SSCANCEL is not accepted because a VEND REQUEST was already issued by the machine. You need to issue a VEND APPROVED or a VEND DENIED command and wait for the session close before trying to cancel again. This answer precedes the SSCANCELFAIL one.
- SSCSLSWAITREVAL	- SSCANCEL is not accepted because a REVALUE REQUEST was already issued by the vending machine. You need to issue a REVALUE APPROVED or a REVALUE DENIED command and wait for a positive answer before trying to cancel again. The answer precedes the SSCANCELFAIL one. So, in this situation you will receive both SSCSLSWAITREVAL followed by SSCANCELFAIL

3. Vend approved

Command	
SSVNDAPP(AAA)	This command approves a vend after the VMC has issued a previous VEND REQUEST command. - AAA is the approved value (scaled by the cashless device scaling factor)
Possible answers	
- SSVNDAPPOK	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll.
- SSVNDAPPFAIL	- if the command reception failed for some reason.
- SSCSLSNOWAITVND	- VEND APPROVED failed because the device is not waiting for a vend approval/denial (the VMC has not issued a previous VEND REQUEST). You should issue this command only after receiving the VEND REQUEST unsolicited message from the device, otherwise you will receive this error message, followed by a SSVNDAPPFAIL response.

4. Vend denied

Command	
SSVNDDEN	This command refuses a vend after the VMC has issued a previous VEND REQUEST command.
Possible answers	
- SSVNDDENOK - SSVNDDENFAIL - SSCSLSNOWAITVND	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll. - if the command reception failed for some reason. - VEND DENIED failed because the device is not waiting for a vend approval/denial (the VMC has not issued a previous VEND REQUEST). You should issue this command only after receiving the VEND REQUEST unsolicited message from the device, otherwise you will receive this error message, followed by a SSVNDDENFAIL response.

5. Revalue approved

Command	
SSREVALAPP	This command approves a revalue after the VMC has issued a previous REVALUE REQUEST command.
Possible answers	
- SSREVALAPPOK - SSREVALAPPFAIL	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll. - if the command reception failed for some reason.

6. Revalue denied

Command	
SSREVALDEN	This command refuses a vend after the VMC has issued a previous REVALUE REQUEST command.
Possible answers	
- SSREVALDENOK - SSREVALDENFAIL	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll. - if the command reception failed for some reason.

7. Revalue limit

Command	
SSREVALLIMIT(AAA)	This is an answer to VMC REVALUE LIMIT REQUEST command. - AAA is the scaled value for the maximum revalue amount you want to accept for the next REVALUE REQUEST from the vending machine.
Possible answers	
- SSREVALLIMITOK - SSREVALLIMITFAIL	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll. - if the command reception failed for some reason.

8. Date/time request

Command	
SSDTREQ	This is requesting the date/time from the VMC. It is useful to get the date/time from the vending machine, to synchronize your application date and time with the VMC NOTE: Not all vending machines are responding with the real date and time. Also, some vending machines have no internal RTC and are not able to supply this information.
Possible answers	
- SSDTREQOK - SSDTREQFAIL	- if the command was successfully received by the interface and placed in pending for sending on the next VMC poll. - if the command reception failed for some reason.

9. Display

Command	
SSDISPLAY(AAA,BBB)	This command will display a message on vending machine display. Some machines are not able to receive this message. Your application is responsible to format he message according to vending machine display size. You can get the vending machine display size issuing the VMCINFO command, described later in the system commands and answers chapter. - AAA is the time for message display. The value is represented by 0.1seconds. To display the message for 2 seconds, for example, this parameter should have a value of 20. Please note that the VMC can replace or erase your message from it's display before the time expire, if other event that requires a message to the customer occurs. - BBB is the message to display.
Possible answers	
- SSDISPLAYOK - SSDISPLAYFAIL - SSDISPNOTAVAIL - SSDISPTIMEERR - SSMSGLENERR	- If the command was successfully received by the interface and placed in pending for sending on the next VMC poll. - If the command reception failed for some reason. - You may receive this message before SSDISPLAYFAIL answer if the machine has no display or if it is reporting that is not able to receive messages from the cashless device (machine is reporting 0 for the number of columns on display if it does not want to receive this message from the cashless device) - You may receive this message before SSDISPLAYFAIL answer if the time parameter is not correct (cannot be > 250) - You may receive this message before SSDISPLAYFAIL answer if your second parameter is longer than 32 characters which is the limit accepted by the MDB protocol.

B. System commands and related answers

Please note that after modifying any device configuration parameter, you need to issue the save settings command in order to make persistent. Also, it is recommended to issue the device reset command or the device reboot command in order to allow the vending machine to reinitialize the cashless device with the new configuration.

1. Reset

Command	
SSRESET	This command will set the cashless device in a state similar with the one on the power-up. The VMC will reset, initialize and, eventually, enable the cashless device.
Possible answers	
- SSRESETOK - SSRESETFAIL	- if the command was successfully received by the interface - if the command reception failed for some reason.

2. Reboot

Command	
SSREBOOT	This command will perform a device cold reset. This command is mandatory after changing and saving device configuration parameters (see system commands chapter below), it will force the CPU reset and settings reload
Possible answers	
- SSREBOOTOK	- if the command was successfully received by the interface

3. Slave (cashless) factory reset

Command	
SSFACTORYRESET	This command will reset all cashless related settings do factory default. It will not alter the master functions settings. After issuing this command, the interface will automatically reboot.
Possible answers	
- SSFACTORYRESETOK	- if the command was successfully received by the interface

4. Status

Command	
SSSTATUS	This command will request the cashless device status information.
Possible answers	
- SSSTATUS(A,B,C,D,E,F,G,H,I)	The status message comes before SSSTATUSOK and have the following parameters: - A – cashless set feature level - B – cashless set scaling factor - C – cashless set decimal places - D – cashless set country code - E – can take one of the following: - REVALON if you set the device to accept revalue command from VMC - REVALOFF if you set the device to not accept revalue command from VMC - F – can take one of the following values - MULTION if you set the device with multivend option enabled - MULTIOFF if you set the device with multivend option disabled - G – can take one of the following values - CASHSALEON if you set the device to accept CASH SALE commands - CASHSALEOFF if you set the device to not accept CASH SALE commands - H – can take one of the following values - CANAI if you set the device to accept Always Idle transactions - CANNOTAI if you set the device to not accept Always Idle transactions - G – can take one of the following values - AION if the Always Idle function was enabled by the vending machine - AIOFF if the Always Idle function was not enabled by the vending machine - H – is the cashless MDB bus read timeout. This parameter value is in milliseconds and is the time the cashless device should wait for an answer from the VMC after sending a message to it. Default value is 3 and you should not modify this value unless you experience a timeout on machine's answers. Wrong value to this parameter may lead to an unresponsive device. - I – is the cashless stage. You may find the stage values and human interpretation later in Appendix I
- SSSTATUSOK - SSSTATUSFAIL	- if the command was successfully received by the interface - if the command reception failed for some reason.

5. Get VMC information

Command	
SSVMCINFO	This command will request vending machine information. Those information are, most of them, available only after the machine finished to initialize the machine.
Possible answers	
- SSVMCINFO(A,B,C,D,E,F,G,H,I)	- A – Is the VMC MDB feature level - B – Is the VMC reported maximum price - C – Is the VMC reported minimum price - D – Is the VMC number of columns on display. If the machine is reporting 0 for the number of columns on display, it is not willing to receive DISPLAY messages from the cashless device. - E – Is the VMC number of rows on display. - F – Is the VMC display type. If this value is 0, then the machine can display numbers, upper case letters, blank and decimal point. If this value is 1, then the machine has a full ASCII display. - G – Is the VMC manufacturer code - H – Is the VMC serial number - I – Is the VMC model number
- SSVMCINFOOK - SSVMCINFOFAIL	- if the command was successfully received by the interface - if the command reception failed for some reason.

6. Set cashless timeout

Command	
SSCSLSTIMEOUT(X)	This command will modify the time (milliseconds) the cashless device should wait for an answer from the VMC after sending a message to it. Default value is 3 and you should not modify this value unless you experience a timeout on machine's answers. Wrong value to this parameter may lead to an unresponsive device.
Possible answers	
- SSCSLSTIMEOUTOK - SSCSLSTIMEOUTFAIL	- if the command was successfully received - if the command reception failed for some reason.

7. Get cashless timeout

Command	
SSCSLSTIMEOUT?	This command will read the time (milliseconds) the cashless device should wait for an answer from the VMC after sending a message to it. Default value is 3 and you should not modify this value unless you experience a timeout on machine's answers. Wrong value to this parameter may lead to an unresponsive device.
Possible answers	
- SSCSLSTIMEOUT(X)	- X is the current set value for cashless timeout oi receiving from the machine after sending a message

8. Set cashless address (primary or secondary)

Command	
SSSECONDARY(X)	This command will modify the cashless device address. Default it's address is 0x10+, but using this command, it's address can be switched to 0x60+ You will need this if you already have a primary cashless device connected to the vending machine. - X can be 0 (primary address) or 1 (secondary address)
Possible answers	
- SSECONDARYOK - SSSECONDARYFAIL	- if the command was successfully received - if the command reception failed for some reason.

9. Get cashless address settings (primary or secondary)

Command	
SSSECONDARY?	This command will read the cashless device address.
Possible answers	
- SSSECONDARY(X)	- X is the current set value for cashless address. If it is 0, then the device is the primary one (address 0x10+). If it is 1, then the device is the secondary one (address 0x60+).

10. Set cashless feature level

Command	
SSCSLSFTLEVEL(X)	This command will modify the cashless feature level. This information is passed to the machine during initialization phase. However, if the machine has feature level 2, the cashless device will also identify itself as a level 2 cashless device, even if you set this value for level 3. This device is not supporting MDB feature level 1 for this parameter and it will not be able to work with MDB level 1 vending machines. - X can be 2 or 3, other values will return SSCSLSFTLEVELFAIL
Possible answers	
- SSCSLSFTLEVELOK - SSCSLSFTLEVELFAIL	- if the command was successfully received - if the command reception failed for some reason.

11. Get cashless feature level

Command	
SSCSLSFTLEVEL?	This command will read the cashless feature level you set before.
Possible answers	
- SSCSLSFTLEVEL(X)	- X is the current set value for cashless feature level

12. Set cashless country code

Command	
SSCSLSCOUNTRY(X)	This command will modify the cashless country code that the device will report to the VMC. This value is a decimal one, please check the ISO currency codes on MDB manual and convert hex code to decimal. - X is the ISO currency code, decimal format.
Possible answers	
- SSCSLSCOUNTRYOK - SSCSLSCOUNTRYFAIL	- if the command was successfully received - if the command reception failed for some reason.

13. Get cashless country code

Command	
SSCSLSCOUNTRY?	This command will read the cashless country code.
Possible answers	
- SSCSLSCOUNTRY(X)	- X is the current cashless country code.

14. Set cashless scaling factor

Command	
SSCSLSSCALE(X)	This command will modify the cashless scaling factor that the device will report to the VMC durint the initialization stage - X is the cashless scaling factor
Possible answers	
- SSCSLSSCALEOK - SSCSLSSCALEFAIL	- if the command was successfully received - if the command reception failed for some reason.

15. Get cashless scaling factor

Command	
SSCSLSSCALE?	This command will read the cashless scaling factor.
Possible answers	
- SSCSLSSCALE(X)	- X is the current cashless scaling factor.

16. Set cashless decimal places

Command	
SSCSLSDECIMALS(X)	This command will modify the cashless decimal places that the device will report to VMC during initialization. - X is the cashless decimal places
Possible answers	
- SSCSLSDECIMALSOK - SSCSLSDECIMALSFAIL	- if the command was successfully received - if the command reception failed for some reason.

17. Get cashless decimal places

Command	
SSCSLSDECIMALS?	This command will read the cashless scaling factor.
Possible answers	
- SSCSLSDECIMALS(X)	- X is the current cashless scaling factor.

18. Set cashless miscellaneous options

Command	
SSCSLSOPTIONS(X)	This command will modify the cashless option bits - X is the cashless miscellaneous options byte, with the following option bits availabe (according to MDB specifications): - b0 – if set, it will enable restoring funds for the cashless device (VMC will activate revalue limit request and revalue request messages if it is capable to manage this features) - b1 – if set, it will enable cashless multivend option if the VMC is multivend capable; - b2 – always cleared; - b3 – if set, if will inform the VMC that the cashless device is capable to accept and manage cash sale subcommand (for statistic purposes, for example).
Possible answers	
- SSCSLSOPTIONSOK - SSCSLSOPTIONSFAIL	- if the command was successfully received - if the command reception failed for some reason.

19. Get cashless miscellaneous options

Command	
SSCSLSOPTIONS?	This command will read the cashless options byte.
Possible answers	
- SSCSLSOPTIONS(X)	- X is the current cashless options byte following the cashless option bits description above.

20. Set cashless manufacturer code

Command	
SSCSLSMFCODE(XXX)	This command will modify the cashless manufacturer code (according to MDB specifications). This code consists of exactly 3 ASCII characters that are reported to the VMC during the initialization phase. You can use your own manufacturer code to identify to the vending machine. Default, this code is “ATM”.
Possible answers	
- SSCSLSMFCODEOK - SSCSLSMFCODEFAIL	- if the command was successfully received - if the command reception failed for some reason.

21. Get cashless manufacturer code

Command	
SSCSLSMFCODE?	This command will read the cashless current manufacturer code.
Possible answers	
- SSCSLSMFCODE(XXX)	- XXX is the cashless current manufacturer code

22. Set cashless serial number

Command	
SSCSLSSN(XXXXXXXXXXXX)	This command will modify the cashless device serial number (according with MDB specifications). This consists of a fixed length 12 ASCII characters hat are reported to the VMC during the initialization phase.
Possible answers	
- SSCSLSSNOK - SSCSLSSNFAIL	- if the command was successfully received - if the command reception failed for some reason.

23. Get cashless serial number

Command	
SSCSLSSN?	This command will read the cashless current serial number
Possible answers	
- SSCSLSSN(XXXXXXXXXXXX)	- XXXXXXXXXXXX is the cashless current serial number

24. Set cashless model number

Command	
SSCSLSMN(XXXXXXXXXXXX)	This command will modify the cashless device model number (according to MDB specifications). This consists of a fixed length 12 ASCII characters hat are reported to the VMC during the initialization phase.
Possible answers	
- SSCSLSMNOK - SSCSLSMNFAIL	- if the command was successfully received - if the command reception failed for some reason.

26. Get cashless model number

Command	
SSCSLSMN?	This command will read the cashless current model number
Possible answers	
- SSCSLSMN(XXXXXXXXXXXX)	- XXXXXXXXXXXX is the cashless current model code

26. Set cashless expansion identification bits

Command	
SSCSLSEXPBITS(X)	This command will modify the cashless expansion identification bits. Possible values for X are 0x00 (always idle mechanism disabled) or 0x20 (always idle mechanism enabled). Any other value may produce unexpected results.
Possible answers	
- SSCSLSEXPBITSOK - SSCSLSEXPBITSFAIL	- if the command was successfully received - if the command reception failed for some reason.

27. Get cashless expansion identification bits

Command	
SSCSLSEXPBITS?	This command will read the cashless expansion identification bits.
Possible answers	
- SSCSLSEXPBITS(X)	- X is the cashless current model code

28. Set cashless fake credit

Command	
SSCSLSFAKECREDIT(X)	This command will set the fake credit the cashless device is sending for button triggered transactions. This is useful when the VMC has no Always Idle support (for example, Level 2 vending machines or Level 3 without Always Idle implementation). You need to install a NO SPST button on the machine's front panel and connect it to the "START" connector of the interface. By pressing this button, the customer can trigger a new cashless session (BEGIN SESSION) with the fake credit value. Most of the machines will accept a value of 65535 for "X" and they will invite the customer to select a product, without displaying any credit value. There are also some machines that will display the fake credit even if the value is 65535. In that case, you may set an arbitrary value (even 0 if the machine is supporting product selection with credit = 0 for cashless transactions). You need to test your machine's capability. Start with 65535 for this parameter and check if the machine is accepting a product selection without displaying the credit value. If the machine is displaying the credit, set this parameter to 0. If it does not allow you to select a product, set this parameter on a value equal or bigger than the most expensive product price to allow the customers selecting a product.
Possible answers	
- SSCSLSFAKECREDITOK - SSCSLSFAKECREDITFAIL	- if the command was successfully received - if the command reception failed for some reason.

29. Get cashless fake credit

Command	
SSCSLSFAKECREDIT?	This command will read the cashless fake credit value.
Possible answers	
- SSCSLSFAKECREDIT(X)	- X is the cashless current fake credit value

30. Set cashless default session timeout

Command	
SSCSLSDEFSESTIMEOUT(X)	This command will set default session timeout (seconds). If a session is opened by button press and the customer is not making any selection in the “X” seconds interval, the interface will automatically cancel the current session. It is an option to make the machine available for the next customer it somebody is just “playing” with the “START” button. Your application may send the “CANCEL” command anytime if you need to cancel the session before the timeout is reached. Default (factory) value is 40 seconds.
Possible answers	
- SSCSLSDEFSESTIMEOUTOK - SSCSLSDEFSESTIMEOUTFAIL	- if the command was successfully received - if the command reception failed for some reason.

31. Get cashless default session timeout

Command	
SSCSLSDEFSESTIMEOUT?	This command will read the cashless default session timeout.
Possible answers	
- SSCSLSDEFSESTIMEOUT(X)	- X is the cashless current default session timeout (seconds)

32. Set cashless default approval timeout

Command	
SSCSLSDEFAPPTIMEOUT(X)	This command will set default approval timeout (seconds). If a product is selected and no approve/deny is coming from your application, then the interface will automatically deny product dispensing after this timeout expires. It is useful if you application stale during approval, to release the machine for another session or for cash sales. The session will be also automatically canceled 3 seconds after the approval timeout, to completely make it available for other transactions. You need to make sure that the default approval timeout is at least 3 seconds shorter than cashless default session timeout otherwise some unexpected events may occur. Default (factory) value is 30 seconds.
Possible answers	
- SSCSLSDEFAPPTIMEOUTOK - SSCSLSDEFAPPTIMEOUTFAIL	- if the command was successfully received - if the command reception failed for some reason.

33. Get cashless default approval timeout

Command	
SSCSLSDEFAPPTIMEOUT?	This command will read the cashless default approval timeout.
Possible answers	
- SSCSLSDEFAPPTIMEOUT(X)	- X is the cashless current default approval timeout (seconds)

34. Set cashless default payment type

Command	
SSCSLSDEFPAYTYPE(X)	This command will set default payment type (according to MDB specifications). Usually, the value for X is 0 for standard payment type.
Possible answers	
- SSCSLSDEFPAYTYPEOK - SSCSLSDEFPAYTYPEFAIL	- if the command was successfully received - if the command reception failed for some reason.

35. Get cashless default payment type

Command	
SSCSLSDEFPAYTYPE?	This command will read the cashless default payment type
Possible answers	
- SSCSLSDEFPAYTYPE(X)	- X is the cashless current default payment type

36. Set cashless default payment data

Command	
SSCSLSDEFPAYDATA(X)	This command will set default payment data (according to MDB specifications). Usually, the value for X is 0 for standard payment data.
Possible answers	
- SSCSLSDEFPAYDATAOK - SSCSLSDEFPAYDATAFAIL	- if the command was successfully received - if the command reception failed for some reason.

37. Get cashless default payment data

Command	
SSCSLSDEFPAYDATA?	This command will read the cashless default payment data
Possible answers	
- SSCSLSDEFPAYDATA(X)	- X is the cashless current default payment data

38. Save settings

Command	
SSSAVESETTINGS	This command will save all modified parameters to the non-volatile memory. After saving settings it is recommended to issue a REBOOT COMMAND
Possible answers	
- SSSAVESETTINGSOK - SSSAVESETTINGSFAIL	- if the command was successfully received - if the command reception failed for some reason.

39. Show settings

Command	
SSSHOWSETTINGS	This command will read the cashless settings
Possible answers	
The device will answer with a list of current set paramenters in the following order:	
- SSCSLSTIMEOUT(X)	- X is the time (milliseconds) the cashless device should wait for an answer from the VMC after sending a message to it, see III.B.5. for details
- SSSECONDARY(X)	- X is 0 if the device is the first cashless device and 1 if the device is second cashless device, see III.B.7. and III.B.8. for details
- SSCSLSFTLEVEL(X)	- X is the current cashless feature level, see III.B.9 and III.B.10 for details
- SSCSLSCOUNTRY(X)	- X is the hex representation of the current country code, see III.B.11 and III.B.12 for details
- SSCSLSSCALE(X)	- X is the current scaling factor, see III.B.13 and III.B.14 for details
- SSCSLSDECIMALS(X)	- X is the current decimal places, see III.B.15 and III.B.16 for details
- SSCSLSOPTIONS(X)	- X is the value for miscellaneous options, see III.B.17 and III.B.18 for details
- SSCSLSMFCODE(X)	- X is the value for manufacturer code, see III.B.19 and III.B.20 for details
- SSCSLSSN(X)	- X is the value for cashless serial number, see III.B.21 and III.B.22 for details
- SSCSLSMN(X)	- X is the value for cashless model number, see III.B.23 and III.B.24 for details
- SSCSLSSV(X)	- X is the value for cashless internal software version
- SSCSLSEXPBITS(X)	- X is the value for cashless expansion identification bits, see III.B.25 and III.B.26 for details
- SSCSLSFAKECREDIT(X)	- X is the value for cashless fake credit, see III.B.27 and III.B.28 for details
- SSCSLSDEFSESTIMEOUT(X)	- X is the cashless default session timeout, see III.B.29 and III.B.30 for details
- SSCSLSDEFAPPTIMEOUT(X)	- X is the cashless default approval timeout, see III.B.31 and III.B.32 for details
- SSCSLSDEFPAYTYPE(X)	- X is the cashless default payment type, see III.B.33 and III.B.34 for details
- SSCSLSDEFPAYDATA(X)	- X is the cashless default payment data, see III.B.35 and III.B.36 for details
- SSSHOWSETTINGSOK	- the list of parameters always ends with SHOWSETTINGSOK

VI. Unsolicited messages

Unsolicited messages are messages that are coming as a result of the VMC activity and not as a result of a command from your application. They may occur at any moment so your application is responsible to constantly listen on the serial or USB interface, parse unsolicited messages and react accordingly.

1. File system status

Command	
- INITFSFAIL	- This this message may come out on power-up or after REBOOT command. This is usually a sign of a defective internal memory and the device will not work
- INITFSOK(1,X,Y)	- This message may come out on power-up or REBOOT command, when the FS was just formatted. X is the number of total used bytes and Y is the number of total memory size
- INITFSOK(2,X,Y)	- This message may come out on power-up or REBOOT if the FS was previously formatted and everything is working fine.

2. Hardware serial number fail

Command	
- SNERR(A,B,C,D,E,F)	- This this message may come out on power-up or after REBOOT command when the current firmware don't match with the device hardware serial number. Please contact us and mention A-F values.

3. Hardware serial number dump

Command	
- SN(A,B,C,D,E,F)	- This this message may come out on power-up or after REBOOT command, showing the hardware serial number.

4. CRC fail for last MDB received message from VMC

Command	
- CRCFAIL(X)	- This this message may come out when there was a communication error (last MDB message received from VMC was an error or was truncated. X is "1" for primary cashless mode and "2" for secondary cashless mode, depending on the device configuration

5. Cashless session timeout

Command	
- SSCSLSSESSTIMEOUT	- This this message may come out when a timeout occurred for the current session. The device will automatically close the current session if there is no product selection after the session started. See III.A.1, III.B.29 and III.B.30 for details.

6. Cashless vend approve timeout

Command	
- SSCSLSVNDAPPTIMEOUT	- This this message may come out when a timeout occurred for the current VEND APPROVE status, if your application stalled. See. III.A.1, III.B.31 and III.B.32 for details.

7. Cashless reset by VMC

Command	
- SSRESETBYVMC	- This this message may come out when the VMC sends a RESET command to the device

8. Cashless not initialized

Command	
- SSNOTINITED	- This this message may come out when your application sends a command, but the cashless was not initialized by the VMC.

9. ACK on the last message sent to VMC

Command	
- SSACK	- This this message may come out after your application sent a message that should be parsed by the VMC, if the VMC correctly received the message.

10. NAK on the last message sent to VMC

Command	
- SSNAK	- This this message may come out after your application sent a message that should be parsed by the VMC, if the VMC did not correctly received the message.

11. Vend request

Command	
- SSVNDREQ(A,B)	- This this message may come out during a session (for Level 2 or Level 3 machines without Always Idle mechanism) or anytime for Level 3 machines with Always Idle mechanism, when the customers is making a selection - A is the scaled product price - B is the item (selection) number Your application needs to issue a VEND APPROVED or a VEND DENIED message as a response to this message, after checking customers balance, for example.

12. Vend cancel

Command	
- SSVENDCANCEL	- This this message may come out during a session (for Level 2 or Level 3 machines without Always Idle mechanism) or anytime for Level 3 machines with Always Idle mechanism, when VMC is waiting for vend approval. Your application

	should take all actions in order to cancel the funds withdrawal,

13. Vend success

Command	
- SSVENDSUCCESS(A)	- This this message may come out after machine successfully dispensed or prepared the selected product. - A is the item (selection) number successfully dispensed.

14. Vend failure

Command	
- SSVENDFAILURE	- This this message may come out if the machine failed to dispense or prepare the selected product.

15. Session complete

Command	
- SSSESSIONCOMPLETE	- This this message may come out when the machine closes the current session.

16. Cash sale reporting

Command	
- SSCASHSALE(A,B)	- This this message may come out after a success cash sale. It is used for reporting purposes and offers your application the possibility to create real time sales reports. This may depend on the VMC configuration and/or implementation, some older machines may not able to report this information. Also, you need to set bit 3 on cashless miscellaneous options. - A is the scaled product price - B is the item (selection) number

17. Disabled by VMC

Command	
- SSDISABLEBYVMC	- This this message may come out when the VMC is disabling the device (during dispensing/preparing or because of an internal error). If the cashless is disabled by VMC for a time longer than the longest preparing time for that specific machine, most probably the machine is out of order due to an internal error and you can consider that for reporting an out of order machine. Some machines are also requiring special settings in their menu.

18. Enabled by VMC

Command	
- SSENABLEBYVMC	- This this message may come out when the VMC is enabling the cashless device.

19. Revalue request

Command	
- SSREVALUEREQ(A)	- This this message may come out when the VMC is trying to load some credit into the user account. It may occur only while a cashless session is opened. You may use this function to add cash loaded into the machine to the customer's account. Bit 0 of miscellaneous byte should be set in order to activate this function. Some machines are also requiring special settings in their menu. This message may also occur in the case of vend failure, some machines are trying to load back the credit to customer's account.

20. Revalue request

Command	
- SSREVALUELIMITREQ	- This this message may come out when the VMC is trying obtain the maximum amount that the cashless device can receive for revalue operations. See III.A.7 for details.

21. Expansion options enabled

Command	
- SSEXPENABLEOPTIONS	- This this message may come out when the VMC activating some of the expansion identification bits. See III.B.25 and III.B.26 for details

22. Date/time

Command	
- SSDATETIME(A,B,C,D,E,F,G,H,I)	- This this message may come out when the VMC is reponding to your application date time request message. A-I are values in order mentioned in MDB specification manual.

23. Cashless is in session

Command	
- SSCSLSISINSESSION	- This this message may come out when your application try to begin a session or when the "START" button is pressed, but a session is currently opened.

24. Cashless not enabled

Command	
- SSCSLSNOTENABLED	- This this message may come out when your application try to begin a session or when the "START" button is pressed, but the cashless device was not enabled by the VMC

25. Begin button pressed

Command	
- SSBEGINBUTTON	- This this message may come out when the customer is pushing the cashless "START" button to load a fake credit to the machine, in order to allow a product selection

26. Cashless wait vend

Command	
- SSCSLSWAITVND	- This this message may come out when a cancel message was sent by your application to the device or a cancel timeout occurred and the cashless device is waiting for a VEND APPROVED or VEND DENIED message.

27. Cashless wait revalue

Command	
- SSCSLSWAITREVAL	- This this message may come out when a cancel message was sent by your application to the device or a cancel timeout occurred and the cashless device is waiting for a REVALUE APPROVED or REVALUE DENIED message.

28. Cashless display time error

Command	
- SSDISPTIMERR	- This this message may come out when the time set for a display message command is not correct.

29. Cashless display message length error

Command	
- SSMSGLENERR	- This this message may come out when the display message length is bigger than 32 bytes (the maximum accepted length, according to MDB specifications).

30. Display not available

Command	
- SSDISPNOTAVAIL	- This this message may come out when the VMC is reporting that it’s display is not available for the messages coming from the cashless device.

Cashless appendix I – cashless stages description

Stage value	Stage description
0	- Power-up or reset by VMC
1	- Received cashless setup config data information from VMC
2	- Received MAX/MIN prices from VMC
3	- Sent JUST reset to VMC
4	- Received VEND REQUEST from VMC
5	- Received VEND CANCEL from VMC
6	- Received VEND SUCCESS from VMC
7	- Received VEND FAILURE from VMC
8	- Received SESSION COMPLETE from VMC
9	- Received DISABLE from VMC
10	- Received ENABLE from VMC
11	- Received CANCEL from VMC
12	- Received DATA ENTRY from VMC
13	- Sent expansion identification to VMC
14	- Received REVALUE REQUEST from VMC
15	- Received REVALUE LIMIT REQUEST from VMC
16	- Sent cashless setup data to VMC
17	- Sent EXPANSION ID to VMC

NOTES: