

## MDB-RS232 Commands for Controlling the Bill Validator / Recycler

Command	HEX code	Description
RESET	30H	Command for bill validator to self-reset
SETUP	31H	Request for bill validator setup information
SECURITY	32H	Sets Validator Security Mode
POLL	33H	Request for Bill Validator activity Status
BILL TYPE	34H	Indicates Bill Type enable or disable Command is followed by set-up data.
ESSCROW	35H	Sent by VMC to indicate action for a bill in escrow
STACKER	36H	Indicates stacker full and the number of bills
EXPANSION COMMAND	37H	Command to allow addition of features and future enhancements. Level 1 and above bill validators must support this command.
	37 00	LEVEL 1 IDENTIFICATION WITHOUT OPTION BITS
	37 01	LEVEL 2+ FEATURE ENABLE
	37 02	LEVEL 2+ IDENTIFICATION WITH OPTION BITS
	37 03	RECYCLER SETUP
	37 04	RECYCLER ENABLE
	37 05	BILL DISPENSE STATUS
	37 06	DISPENSE BILL
	37 07	DISPENSE VALUE
	37 08	PAYOUT STATUS
	37 09	PAYOUT VALUE POLL
	37 0A	PAYOUT CANCEL

**NOTE:** The expansion command is always followed by a sub-command.

- For the MDB-RS232 adapter, the adapter itself will perform the POLL (33H) command to read the data and status of the Bill validator. When the Bill validator receives a bill or has a status that needs to be reported, it will send the corresponding data to the VMC board through the MDB-RS232 adapter in the corresponding time period. Therefore, the VMC board software engineer doesn't need to consider the POLL command and the specific timing, but only needs to send the RESET command when needed, The SETUP reads the configuration, and then enables the corresponding type of the bills through the BILL TYPE according to the SETUP data. Then, as long as there is a bill accepted, the STACKER command is used to query the status of the number of bills
- Change commands, generally as long as the 0F02 instruction is applicable, generally not applicable to the 0DH instruction

Next, we will briefly introduce the development command sequence of the bill validator:

For example, after the MDB-RS232 is powered on, we will receive the RESET success data (the following test data is only connected to the bill acceptor):

After the MDB-RS232 is powered on, it will actively send a 30H command to the coin machine to reset, and if the device exists, it will reply to 00 to confirm or report it later. When the device is RESET, 06 is reported. Therefore, when MDB-RS232 is used to control the payment device, we only need to judge whether the bill acceptor is working properly based on the data and status reported by MDB-RS232.

```

Shanghai Wafer Microelectronics Co.,Ltd - Com Test Tools
File Device Help
MDB-RS232 V4.2 compatible
08 FF
30 FF
10 FF
40 FF
60 FF
FF
30 06
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09
30 09

```

- Next, we start to read the configuration data of the bill acceptor  
Send **31H** (read the configuration parameters, the parameters of these replied byte are quite important and must be understood)  
Example of a reply: 02 11 56 00 **0A 01** 00 C8 00 3F FF 01 05 0A 14 32 64 00 00 00 00 00 00 00 00 00 00 34  
(The scaled factory data is 0A 01 and it can accept the bill type: 01, 05, 0A, 14, 32, 64)  
Send **3700** (read the device ID, these parameters have nothing to do with calculating the price, including the Device code,firmware version, manufacturer model, etc., we generally report these parameters to the server when we do DEX data reports, which is easy to manage)  
Example of a reply:  
49 43 54 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 4E 45 37 37 42 32 42 2D 43 4E 59 36 01 14 F9
- About the question: that the VMC will always receive 30 09 data after the bill acceptor is powered on  
Both bill acceptor and coin validator are disabled after powered on. However, the Disabled status of the coin device will not be actively reported, while the disabled status of the bill acceptor will always be reported to the VMC, and the VMC will continue to receive the status of 09 until the bill acceptor is enabled with the **BILL TYPE** (enable command).

## Now, we have already completed the basic configuration and reading

- Next, we need to send the corresponding enable command according to the type of bills we need to receive (or disable the receipt of bills) and also to enable the Bill Escrow, such as  
**34FFFFFF** (Once this command is sent, the bill acceptor can accept all the bills and also enable all the Escrow)  
Example of a reply: 00  
**3400000000** (Once this command is sent, All the bills and Escrow are disabled)  
Example of a reply: 00  
**34001F001F** (Once this command is sent, just the Bill type 0,1,2,3,4,5 and its Escrow is enabled)  
Example of a reply: 00

Next, just wait for MDB-RS232 to report the data when there is a bill inserted or when the bill acceptor status changes. Of course, the VMC engineer will still apply the 36 command every few seconds to read the status of the stacker in real time. It can know the status of the stacker at any time, providing an accurate operation when bill stacker is full.

Received bill data: 30 82 (We can look at the 82H reply in the MDB protocol)  
Receive status data: 30 0B (A note is detected, but it was not recognized, and it was rejected)  
30 09 (Bill acceptor is disabled)

### How can we tell the difference between bill data and status data?

The bill data is composed of two bytes, and the first byte must be greater than 80H. So we receive the data, starting with ID data 30, it is determined that it is the data of the bill acceptor, followed by 82, which is the bill data, and the decomposition into binary data is 1000 0010

Z1  
(1yyyxxxx)

yyy = Bill Routing: 000: BILL STACKED  
001: ESCROW POSITION<sup>2</sup>  
010: BILL RETURNED  
011: BILL TO RECYCLER<sup>1</sup>  
100: DISABLED BILL REJECTED  
101: BILL TO RECYCLER – MANUAL FILL<sup>1,3</sup>  
110: MANUAL DISPENSE<sup>1</sup>  
111: TRANSFERRED FROM RECYCLER  
TO CASHBOX<sup>1</sup>

xxxx = Bill Type (0 to 15)

(According to the explanation of the screenshot of the MDB protocol, it is: 02 type of bill, enter the stacker)

Next, we introduce the bill credit value calculation based on configurations

For example, with the 31H command, we read back the configuration data:

02 11 56 **00 0A 01** 00 C8 00 3F FF 01 05 0A 14 32 64 00 00 00 00 00 00 00 00 00 00 34

That is, Bill Scaling Factor and Decimal Places is **000A and 01** in red, and Bill Type data is 01,05,0A,14,32,64

Therefore,

1. The value of bill type 0 is 01: Multiply by the Bill scale factor is  $01 * 10 = 10$ , and then divide by 10 (1 decimal place to the left), that is, so the coin's monetary value is 1
2. The value of bill type 1 is 05: Multiply by the coin scale factor is  $05 * 10 = 50$ , and then divide by 10 (1 decimal place to the left), that is, so the coin's monetary value is 5

(As can be seen here, our bill acceptor can receive the bill credit as \$1, \$5, \$10, \$20, \$50, \$100)

So if received a Bill data 30 82, then 82 means a Bill type 02 bill, so we received a credit \$10 into the bill stacker.

- Next, let's list the following bill acceptor command

31 Reply: 02 11 56 00 0A 01 00 C8 00 3F FF 01 05 0A 14 32 64 00 00 00 00 00 00 00 00 00 00 34

3700 Reply: 49 43 54 00 00 00 00 00 00 00 00 00 00 00 00 00 4E 45 37 37 42 32 42 2D 43 4E 59 36 01 14 F9

3400000000 Reply: 00

(After the Disable command is sent, the **30 09** status report will continue to be received until the Bill acceptor is enabled again.)

34FFFFFFF Reply: 00

36 Reply: 00 02 02 (If no bills in the stacker, then will reply with 00 00 00)

### The following is a list of standard command sequences for bill recycler change:

(For details, please refer to our document "How to test bill acceptor recycler changer with MDB-RS232")

Below we provide examples of change for two types of banknotes, and the other types can be understood with reference to the MDB protocol

1. Enable bill acceptor recycler

**370100000002**

## 2. Read the settings of the bill acceptor about the recycler

(The value that is read back indicates which type bill is entered into the recycler after receiving the coin.)

Then we know which bill type are in the recycler and can be used for subsequent Payout

**3703**

Replies: 00 04 04 (which means that type 2 bill is preset to enter the recycler: 00000000 00000100)

Replies: 00 01 01 (which means that type 0 bill is preset to enter the recycler: 00000000 00000001)

If the reply is a different value, then convert it to a binary value and understood with protocol

## 3. Enable the recycler

*\* If the **3703** command is replied with **000404***

03 Data position, according to the reply value of the 3703 command, the enable command is:

**37040000 0000030000000000000000000000000000000000**

== Now we can start testing the bill recycler by first putting in a bill that corresponds to the recycler

We receive data, for example **30 B2 29**

(From this data, it can be seen that the bill Type is 02, and it enters the recycler)

*\* If the **3703** command is replied with **000101***

03 Data position, according to the reply value of the 3703 command, the enable command is:

**37040000 0300000000000000000000000000000000000000**

== Now we can start testing the Bill recycler by first putting in a bill that corresponds to the recycler

We receive data,for example **30 B2**

(From this data, it can be seen that the Bill type is 02, and it enters the recycler)

## 4. Send an command to Payout

**3706020001**      **02** is the bill type, which needs to be the same as the received bill type data

**3706000001**      **00** is the bill type, which needs to be the same as the received bill type data

Also we can do the Payout according to the bill credit amount

**3707000A 000A** is the total credit amount of the bills that needs to be paid out

**As can be seen from the above, each Bill type that can be paid out must be the same as the Bill type that enters the Recycler, otherwise the reply may only be FF, or 00, but there will be no status data of the payout process (Of course if there is no currency to be paid out, it will also reply 00)**

For example, it will be received during or after payout command

30 22      The bill recycler is busy

30 2A      The paid out bill is waiting to be picked up (as long as you don't pick it up, you will always receive this status report)