PICOBRIDGE RS232
(Executive ↔ MDB bridge mode)
v06.05.2018

Table of Contents

I. Device overview

This device was designed to offer a quick development support for cashless systems on Executive vending machines and using MDB payment systems. It acts like a bridge between any Executive machine and MDB payment systems (bill validator, coin acceptor/changer and a cashless device). This device is working only with Level 3 or higher coin changers, because it only supports alternative payout change mode of MDB protocol.

IMPORTANT!!! - The machine must be set on Executive, either price holding mode (prices are kept on the device not on the machine) or with prices on the machine. When the prices are held on the machine, you will not be able to obtain a total value of sold products, unles your application keeps the prices for each item, too.

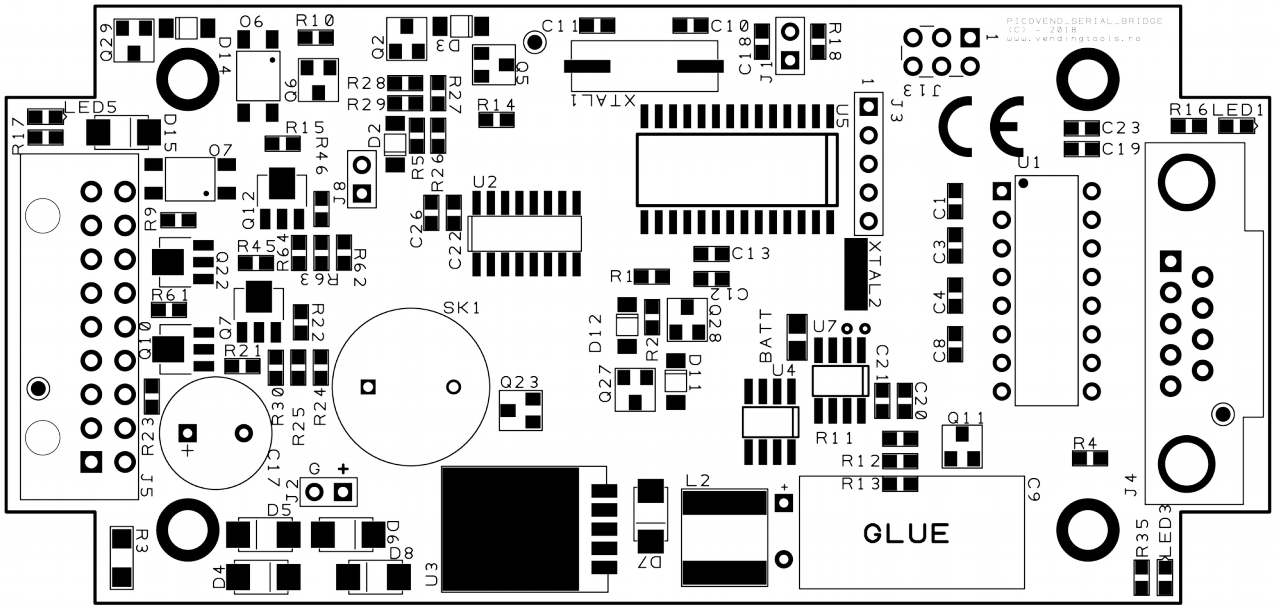
It can be used on any Executive price holding vending machine with a maximum of 96 selections (products).

The device is self maintained and transparently manages the entire Executive, MDB and transactions flow.

The main functions available remotely by using serial port are:

- reading device memory (including sales counters, cash counters, vending settings, etc.);
- writing device memory (erasing counters, setting prices, setting vending settings, etc.);
- rising a credit to the vending machine;
- give some change to the customer;
- reading informations about the MDB cash payment systems status;
- reading informations about the current selected product on the machine’s keyboard;
- reading informations about the last transaction (vend success, vend failed);
- reading informations about the cash inserted and about the change returned to the;
- reading informations about the VMC status;
- resetting the device.

II. Hardware overview.



1. Connectors description

- J5 – see table below

Pin no.	Pin description	Function details
1	AC power IN	AC power IN – only for Executive bridge and MDB master mode
2	AC power IN	AC power IN – only for Executive bridge and MDB master mode
3	24VDC power IN/OUT	MDB slave power input
4	GND	GND
5	GND	Signal GND for MDB master mode
6	Master RX	MDB master mode RX
7	GND	GND
8	Master TX	MDB master mode TX
9	GND	GND
10	Executive RX	Executive to MDB bridge mode – Executive RX
11	GND	GND
12	Executive TX	Executive to MDB bridge mode – Executive TX
13	GND	GND
14	MDB slave TX	MDB slave mode TX
15	GND	GND
16	MDB slave RX	MDB slave mode RX
17	Signal GND	MDB slave mode signal GND
18	Master wake	Not implemented in this firmware version (battery mode MDB payment systems wake signal)

- J1 – working mode change jumper
- J8 – when installed, enables MDB sniffer
- J4 – RS232 DB9 female connector. You need a straight cable or you can connect an USB to RS232 cable. Please make sure your USB to RS232 cable/converter can correctly handle hardware flow (RTS/CTS). Best results were obtained using FTDI

based cables/converters and PL2303 based cables/converters. Please chek our demo application to see the correct RTS/CTS handling.

2. Power supply requirements

The PICOBRIDGE can be powered with 24V AC/DC or 12V AC/DC, depending on your MDB PERIPHERALS.

NOTE: If you apply 24AC, please make sure that your MDB peripherals can support 34VDC input. Otherwise, use a DC power supply.

3. Device memory map

The device's non-volatile memory contains all settings and counters needed for the device to work. The table below shows the memory map.

Address (decimal)	Size (bytes)	Description
0 → 383	384	Prices – not scaled (4 bytes for each price, from selection 1 to 96) for example a price of EUR12.50 will be represented by the following value: - B0 – 0x00 - B1 – 0x00 - B2 – 0x04 - B3 - 0xE2
384	1	Vending settings - **needs device reset command after successful write of this settings** - b0 – if set – machine is multivend, otherwise single vend - b1 – if set – machine is in price holding mode, otherwise, the prices are set on the machine - b2 – if set – machine is in force vend mode (no change without sale), otherwise it will return change even if no sale requested (can work as a change machine) - b3 – if set – machine returns no change (change inhibited) - b4 – if set – machine displays price if no credit available - b5 – b7 – reserved (not used in this version)
385 → 388	4	Maximum cash credit accepted for a transaction - **needs device reset command after successful write of this settings**
389 → 392	4	Maximum change that machine can return for a transaction - **needs device reset command after successful write of this settings**
393	1	Scaling factor (usually 10 covers most of the currencies) - **needs device reset command after successful write of this settings**
394	1	Decimal point (on the machine's display) - **needs device reset command after successful write of this settings** - if it is 0 – no decimal places - if it is 2 – one decimal - if it is 4 – two decimals - if it is 8 - three decimals
395 → 398	4	Not used in this version
399 → 403	5	Not used in this version
404 → 454	50	Not used in this version
455 → 505	50	Not used in this version
506 → 556	50	Not used in this version
557 → 607	50	Not used in this version
608 → 611	4	Not used in this version
612	1	Button status – not used in this version – kept for PICOVEND GIGA protocol compatibility - b0 – button 1 pressed since the last ACK sent to the device - b1 – button 2 pressed since the last ACK send to the device - b2 → b7 – reserved for future use
613 → 814	207	Not used in this version
815 → 818	4	Cashless counter (accumulated cashless sales value)
819 → 822	4	Change counter (accumulated change returned value)
823 → 826	4	Bill counter (accumulated bill accepted value)
827 → 830	4	Coins counter (accumulated coins accepted value)
831 → 1023	192	Products counters (2 bytes for each product, from selection 1 to 96)

III. Low level communication protocol

A. Serial port settings

The low level communication protocol can be used with and hardware flow control capable RS232 device (PLC, SBC, industrial computer, etc.)

Communication parameters are:

- baud rate – 115200 (could be delivered with other baud rates upon request)
- data bits – 8
- stop bits – 1
- parity – None
- hardware flow control (RTS/CTS)

B. Low level protocol messages

Every message consists of a message header, message data and CRC. The CRC is calculated by an XOR operation of the message header and message data bytes.

Every time a command or a response is sent, the other device should answer with ACK or NACK, accordingly.

ACK message is: 0xFC 0xFC 0xFC 0xFC 0x00

NACK message is: 0xFD 0xFD 0xFD 0xFD 0x00

As a convention for the protocol description tables, B0, B1, … Bn represents “byte number” and b0, b1, … bn represents “bit number”. Also, we will refer to this interface as “device” or as “bridge”

1. Write to memory

Using this command the data is written into the device non-volatile memory. The maximum length of data that could be written with one command is 64bytes. The device's internal memory store the vending settings, counters, prices, etc. It is possible to modify, at any time, any of the device's settings, reset the counters, etc. After modifying the vending configuration, the user application must send a reset command to the device. Prices and counters modification does not need a reset.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x01	- B2-B3 – beginning address to write (for example 0x02 0x58 means that the first byte will be written at address decimal 600) - B4-Bn – data bytes to be written starting with address [B2:B3]	CRC
Device response			
		ACK or NACK, according to the command execution result	

WARNING!

Writing wrong values for some parameters may put the device in an unstable or unknown state. You are responsible to manage parameter settings to keep the interface working. Be careful modifying those parameters and please make sure you clearly understand the meaning of each parameter.

2. Read from memory

Using this command the data could be read from device's non-volatile memory. The maximum length of data that could be read with one command is 64 bytes. The device's internal memory store the vending settings, counters, prices, etc. It is highly recommended to read memory locations after write operations, to ensure that data was correctly written.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x02	- B2-B3 – beginning address to read (for example 0x02 0x58 means that the first byte will be read from address decimal 600) - B4-B5 – data length	CRC
Device response			
0xFA	0x02	- B2 → Bn – data bytes read from memory	CRC

3. Device reset

Using this command the user's application can reset the device at any moment. After reset, the vending settings are reloaded and the current credit is set to 0.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x03	No parameters	0xF9
Device response			
		ACK or NACK, according to the command execution result	

4. Get device status

Using this command, at any time, the device can be interrogated about it's and it's peripherals status.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x09	No parameters	CRC
Device response			
0xFA	0x09	Note: - the response CMD is 0x09 and not 0x04!!! Status message - B2 – B16 – Device name (ASCII) for example PICOBRDGEXEMDB - B17 – B24 – bill validator status history (B24 contains the latest status – codes are based on the MDB bill validator answers on MDB poll command) - B25 – B32 – coin acceptor status history (B32 contains the latest status – codes are based on the MDB coin answers answers on MDB poll command) - B33 – B40 – cashless device status history (B40 contains the latest status – codes are based on the MDB cashless answers on MDB poll command) - B41 – B44 – VMC status history (0x00 – machine is up and running, 0x40, machine is out of order) - B45 – B48 – coins value counter - B49 – B52 – bills value counter - B53 – B56 – cashless value counter - B57 – B60 – change value counter - B61 – B64 – tube status (total coins value available in changer tubes) - B65 – Always read 0 - B66 – B69 – current cash credit - B70 – B73 – current cashless credit - B74 – B75 – allways read 0x0000 - B76 – B87 – device serial number (ASCII representation of HEX serial number) Most of the above values may be modified by using writemem command at the right address (see memory map table)	CRC

5. Send some credit to the machine

Using this command the user's application can send a credit to the vending machine in order to offer the possibility to select and sell a product. If the credit is higher than the price of the product selected by the customer, the difference will be ignored and cleared after the transaction, if the transaction is successful. When the customer is selecting a product, the device will return an unsolicited message containing selection number and selection price (see below – "Product selected – unsolicited message"). At the end of the transaction, the device will return an unsolicited message containing the transaction result (success or failed) according to the machine's response, based on Executive protocol.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x06	- B2 → B5 – The value (not scaled) that the user application needs to rise on the machine	CRC
Device response			
		ACK or NACK, according to the command execution result	

6. Return change to the customer

Using this command the user's application can send a command to force return change tu the customer.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x08	- B2 → B5 – The value (not scaled) that the user application needs to return to the customer	CRC
Device response			
		ACK or NACK, according to the command execution result	

7. Request current credit

This command can be used at any time to check if the machine has some credit. The "Send credit" command also modify the amount reported by this command.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x0C	None	CRC
Device response			
0xFA	0x0C	- B2 → B5 – The value (not scaled) of the current credit on the machine. For example, for EUR10.00 the values will be: - B2 = 0x00 - B3 = 0x00 - B4 = 0x03 - B5 = 0xE8 - B6 → B9 – The value (not scaled) of the current cashless credit on the machine (if an MDB cashless device is connected and the cashless media is inserted).	CRC

8. Product selected – unsolicited message

This message could be received at any time, if the customer selects a product. It can be received even if there is no credit on the machine. The user's application can decide to send the corresponding credit to the device. In this situation, the machine will automatically sell the selected product. The credit must be sent in a short interval that depends on the machine (usually 8-10 seconds).

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x0A	- B2 – selection number - B3 → B6 – selection price	CRC

9. Transaction result – unsolicited message

This message it is received at the end of every transaction, to inform the user's application about it.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x0B	- B2 – transaction result (0x00 – transaction failed, 0x01 – transaction successful)	CRC

10. Bill accepted by the vending machine – unsolicited message

This message is received every time a bill is accepted and stacked.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x0D	- B2 – B5 – the value (not scaled) of the last bill accepted and stacked by the bill validator For example, for EUR10.00 the values will be: - B2 = 0x00 - B3 = 0x00 - B4 = 0x03 - B5 = 0xE8	CRC

11. Coin accepted by the vending machine – unsolicited message

This message is received every time a coin is accepted and sorted.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x0E	- B2 – B5 – the value (not scaled) of the last coin accepted and sorted by the bill validator For example, for EUR1.00 the values will be: - B2 = 0x00 - B3 = 0x00 - B4 = 0x00 - B5 = 0x64	CRC

12. Cashless in session – unsolicited message

This message is received every time the attached MDB cashless device is opening a cashless session, if the cashless credit is not 0.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x10	- B2 – B5 – the value (not scaled) of the credit available on cashless media For example, for EUR1.00 the values will be: - B2 = 0x00 - B3 = 0x00 - B4 = 0x00 - B5 = 0x64	CRC

13. Cashless finished session – unsolicited message

This message is received every time the attached MDB cashless is closing the current session

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x10	- B2 – B5 – always 0xFFFFFFFF	CRC

14. Change requested – unsolicited message

This message is received every time a customers press the change request button or lever or every time the device is sending “Return change” command.

<HEADER> (B0)	<CMD> (B1)	<PARAMETERS> (B2 to Bn)	<CRC> (Bn + 1)
0xFA	0x0F	- B2 – B5 – the value (not scaled) of the last coin accepted and sorted by the bill validator For example, for EUR1.00 the values will be: - B2 = 0x00 - B3 = 0x00 - B4 = 0x00 - B5 = 0x64 Value is 0xFFFFFFFF if one of the conditions below are met (and the interface will not return change to the customer even if there is some credit remaining): - credit comes over the serial interface and not from inserted cash (let you control if you want to return change for cashless credit loaded by serial port) - machine is set for force vend and no product sold, yet - current cash credit is greater than maximum change set on the interface - there are not enough coins in the coin changer - if the change operation is inhibited in the interface settings Pressing changer escrow lever while the current credit is 0 will be ignored. No message sent in this situation.	CRC

IV. High level protocol

A. Overview

The high level protocol is available by using our demo application that is connecting to the serial port and that can be accessed by the user's application through a socket. The application requires Python 3 to be installed on the user's application computer and, also, depends on PySerial (tested with PySerial versions 3.0.1, 3.2.4 and 3.3).

The demo application requires one parameter (serial port name) and listens on port 5127 TCP.

You can use telnet or other similar application to test the daemon, sending simple commands and receiving JSON response messages.

The JSON answer is a list containing the hexadecimal values of the binary low level protocol in chapter III or an interpreted message, depending on the issued command.

B. Protocol description

1. Write to memory - METWRITEMEM

This command writes a set of bytes starting at a specified address. The data set length cannot be longer than 64 bytes. The dataset is a list of bytes, in decimal format.

Command
Example, setting second price to 1600 (EUR16.00) METWRITEMEM(4,0,0,6,64) First parameter of this function is the address to start writing, the rest of the parameters are byte values to write
Device response
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}

2. Read from memory - METREADMEM

This command writes a set of bytes starting at a specified address. The data set length cannot be longer than 120 bytes. The dataset is a list of bytes, in decimal format.

Command
Example, reading second price METREADMEM(4,4) First parameter of this function is the address to start reading, the second parameter is the length (in bytes) to read
Device response
"{DeviceMessage": "ReadMemory", "StartAddress": 0, "DataLegth": 10, "MemoryData": [0,0,0,100,0,0,0,150,0,0]}

3. Send credit to the machine - METSENDCREDIT(value)

This command sends a credit to the machine (not scaled value)

Command
Example, sending EUR1.60 to the machine METSENDCREDIT(160)
Device response
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}

4. Return change from the machine - METSENDCHANGE(value)

This command returns change (not scaled value)

Command
Example, return EUR1.60 from changer METSENDCHANGE(160)
Device response
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}

5. Get device status - METGETSTATUS

This command returns a JSON corresponding to the peripherals and counters status.

Command
METGETSTATUS
Device response
{DeviceMessage": "DeviceStatus", "DeviceName": "PICOBRDGEXEMDB ", "BillStatus": [144,0,128,0,144,0,128,0], "CoinStatus": [0,1,2,0,1,0,1,0], "CashlessStatus": [0,0,0,0,0,0,0,0], "VMCStatus": [0,0,0,0], "CoinsCounter": 4294967295, "BillsCounter": 700, "CashlessCounter": 4294967295, "ChangeCounter": 300, "AvailableChange": 8720, "Button1": "NotPressed", "Button2": "NotPressed", "CurrentCashCredit": 0, "CurrentCashlessCredit": 0, "CurrentTemperature": 0.0, "SerialNumber": "d880399756ca"} This device has no buttons input circuits, it will always return “NotPressed” for buttons – kept for protocol compatibility This device has no temperature sensor, it will always return 0.00 – kept for protocol compatibility

6. Device reset - METRESET

This command will reset the device

Command
METRESET
Device response
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}

7. Read product price - METREADPRICE(n)

Using this command the user's application can read the price of specified product. Prices are stored into the device's non-volatile memory

Command	Description
METREADPRICE(n)	- Reads the non-scaled price for the product number "n". First product is product number 1, last product is the product number 96 Below is the answer to the METREADPRICE(5) command
Device response	
{"DeviceResponse":"ReadPrice","ProductNumber":"5","ProductPrice":"150"}	

8. Write product price – METWRITEPRICE(n,value)

Using this command the user's application can write the price of specified product. Prices are stored into the device's non-volatile memory

Command	Description
METWRITEPRICE(n,value)	- Writes the non-scaled price for the product number "n". First product is product number 1, last product is the product number 96. For example METWRITEPRICE(5,150) sets the price of the 5th selection to EUR 1.50
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

9. Read maximum credit setting - METREADMAXCREDIT

Using this command the user's application can read the maximum credit set on the device. While a transaction, if the cash inserted by the customer reaches this limit, the payment systems are inhibited. It Is a safety method to avoid returning too much change.

Command	Description
METREADMAXCREDIT	- Reads the non-scaled MAXIMUM CREDIT settings for transactions. Below is the an example answer to the METREADMAXCREDIT command (maximum credit is set to EUR 10.00)
Device response	
{"DeviceResponse":"ReadMaxCredit","MaxCreditValue":"1000"}	

10. Write maximum credit setting - METWRITEMAXCREDIT(value)

Using this command the user's application can write the maximum credit set on the device. While a transaction, if the cash inserted by the customer reaches this limit, the payment systems are inhibited. It Is a safety method to avoid returning too much change.

Command	Description
METWRITEMAXCREDIT(value) **Requires METRESET after issuing this command, since the value is loaded only once, at start-up**	- Writes the non-scaled MAXIMUM CREDIT accepted for a transaction. For example set max credit to EUR 5:.00 METWRITEMAXCREDIT(500)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

11. Read maximum change setting - METREADMAXCHANGE

Using this command the user's application can read the maximum change permitted after a transaction. If the credit remaining after a transaction is higher than this value, them the machine will not return change. It is used also as a safety method to avoid returning too much change.

Command	Description
METREADMAXCHANGE	- Reads the non-scaled MAXIMUM CHANGE settings for transactions. Below is the an example answer to the METREADMAXCHANGE command (maximum credit is set to EUR 9.00)
Device response	
{"DeviceResponse":"ReadMaxChange","MaxChangeValue":"900"}	

12. Write maximum change setting - METWRITEMAXCHANGE(value)

Using this command the user's application can write the maximum credit set on the device. While a transaction, if the cash inserted by the customer reaches this limit, the payment systems are inhibited. It Is a safety method to avoid returning too much change.

Command	Description
METWRITEMAXCHANGE(value) **Requires METRESET after issuing this command, since the value is loaded only once, at start-up**	- Writes the non-scaled MAXIMUM CHANGE accepted for a transaction. For example set max change to EUR 5.00: METWRITEMAXCHANGE(500)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

13. Read scaling factor - METREADSCALINGFACTOR

Using this command the user's application can read the scaling factor on the device. Usually is is a good practice to keep the scaling factor sync-ed with the machine's scaling factor setting. Some machines are ignoring this and work on their scaling factor. In that case, if they are not matching, this will drive you to display error on values.

Command	Description
METREADSCALINGFACTOR	- Reads the SCALING FACTOR settings credit and price display. Below is the an example answer to the METREADSCALINGFACTOR command (where scaling factor is 10)
Device response	
{"DeviceResponse":"ReadScalingFactor","ScalingFactorValue":"10"}	

14. Write scaling factor – METWRITESCALINGFACTOR(value)

Using this command the user's application can write the scaling factor set on the device. Usually is is a good practice to keep the scaling factor sync-ed with the machine's scaling factor setting. Some machines are ignoring this and work on their scaling factor. In that case, if they are not matching, this will drive you to display error on values.

Command	Description
METWRITESCALINGFACTOR(value) **Requires METRESET after issuing this command, since the value is loaded only once, at start-up**	- Writes the SCALING FACTOR setting for credit/price display. For example set scaling factor to 10: METWRITESCALINGFACTOR(10)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

15. Read decimal point - METREADDECIMALPOINT

Using this command the user's application can read the decimal point on the device. Usually is is a good practice to keep the decimal point sync-ed with the machine's decimal point setting. Some machines are ignoring this and work on their decimal point setting. In that case, if they are not matching, this will drive you to display error on values.

Command	Description
METREADDECIMALPOINT	- Reads the DECIMAL POINT settings for credit/price display. Below is an example answer to the METREADDECIMALPOINT command (where decimal point is 2, meaning 2 decimals after the decimal point):
Device response	
{"DeviceResponse":"ReadDecimalPoint","DecimalsNumber":"2"}	

16. Write decimal point – METWRITEDECIMALPOINT(value)

Using this command the user's application can write the decimal point on the device. Usually is is a good practice to keep the decimal point sync-ed with the machine's decimal point setting. Some machines are ignoring this and work on their decimal point setting. In that case, if they are not matching, this will drive you to display error on values.

Command	Description
METWRITEDECIMALPOINT(value) **Requires METRESET after issuing this command, since the value is loaded only once, at start-up**	- Writes the DECIMAL POINT. For example set decimal point to 2: METWRITESCALINGFACTOR(2)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

17. Read coins counter - METREADCOINSCOUNTER

Using this command the user's application can read the non-volatile counter representing the total value of the cashed coins.

Command	Description
METREADCOINSCOUNTER	Reads the COINS COUNTER Below is an example where the device shows a value or EUR 6.70 for the cashed coins.
Device response	
{"DeviceResponse":"ReadCoinsCounterValue","CoinsCounterValue":"670"}	

18. Write coins counter – METWRITECOINSCOUNTER(value)

Using this command the user's application can write the non-volatile counter representing the total value of the cashed coins. It can be used to set this value to 0 when the vending machine operator is performing a cash-collect operation.

Command	Description
METWRITECOINSCOUNTER(value)	- Writes the coins counter. For example resetting the counter on cash-collect: METWRITECOINSCOUNTER(0)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

19. Read bills counter - METREADBILLSCOUNTER

Using this command the user's application can read the non-volatile counter representing the total value of the cashed bills.

Command	Description
METREADBILLSCOUNTER	Reads the BILLS COUNTER Below is an example where the device shows a value or EUR 104.00 for the cashed bills.
Device response	
{"DeviceResponse":"ReadBillsCounterValue","BillsCounterValue":"10400"}	

20. Write bills counter – METWRITEBILLSCOUNTER(value)

Using this command the user's application can write the non-volatile counter representing the total value of the cashed bills. It can be used to set this value to 0 when the vending machine operator is performing a cash-collect operation.

Command	Description
METWRITEBILLSCOUNTER(value)	- Writes the bills counter. For example resetting the counter on cash-collect: METWRITEBILLSCOUNTER(0)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

21. Read change counter - METREADCHANGECOUNTER

Using this command the user's application can read the non-volatile counter representing the total value of the returned change to the customers.

Command	Description
METREADCHANGECOUNTER	Reads the CHANGE COUNTER Below is an example where the device shows a value or EUR 12.10 for the returned change.
Device response	
{"DeviceResponse":"ReadChangeCounterValue","ChangeCounterValue":"1210"}	

22. Write change counter – METWRITECHANGECOUNTER(value)

Using this command the user's application can write the non-volatile counter representing the total value of the returned change. It can be used to set this value to 0 when the vending machine operator is performing a cash-collect operation.

Command	Description
METWRITECHANGECOUNTER(value)	- Writes the change counter. For example resetting the counter on cash-collect: METWRITECHANGECOUNTER(0)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

23. Read cashless counter - METREADCASHLESSCOUNTER

Using this command the user's application can read the non-volatile counter representing the total value of the cashless transactions.

Command	Description
METREADCASHLESSECOUNTER	Reads the CASHLESS COUNTER Below is an example where the device shows a value or EUR 12.50 for cashless transactions.
Device response	
{"DeviceResponse":"ReadCashlessCounterValue","CashlessCounterValue":"1250"}	

24. Write cashless counter – METWRITECASHLESSCOUNTER(value)

Using this command the user's application can write the non-volatile counter representing the total value of the cashless transactions. It can be used to set this value to 0 when the vending machine operator is performing a cash-collect operation.

Command	Description
METWRITECASHLESSCOUNTER(value)	- Writes the cashlesscounter. For example resetting the counter on cash-collect: METWRITECASHLESSCOUNTER(0)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

25. Read product counter - METREADPRODUCTCOUNTER(n)

Using this command the user's application can read the non-volatile counter representing the total (pieces) sales for a product.

Command	Description
METREADPRODUCTCOUNTER(n)	Reads the product Below is an example where the device shows a number of 16 poducts sold for selection number 1 as an answer to METREADPRODUCTCOUNTER(1)
Device response	
{"DeviceResponse":"ReadProductCounter","ProductNumber":"1","ProductSalesNumber":"16"}	

26. Write product counter – METWRITEPRODUCTCOUNTER(n,value)

Using this command the user's application can write the non-volatile counter representing the total (pieces) sales for a product. It can be used to set this value to 0 when the vending machine operator is performing a refill operation.

Command	Description
METWRITEPRODUCTCOUNTER(n,value)	- Writes the product counter . For example resetting the counter for product 1 on refill: METWRITEPRODUCTCOUNTER(1,0) Product number can take values between 1 and 96 and number of sales can take values between 0 and 65535 (2 bytes)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

27. Read vending settings - METREADVENDINGSETTINGS

Using this command the user's application can read the device vending settings

Command	Description
METREADVENDINGSETTINGS	Reads the device vending settings.
Device response	
{"DeviceResponse":"ReadVendingSettings","VendingSettingsValue":"7"} The value is representing the byte at address 384 in memory map table.	

28. Write vending settings – METWRITEVENDINGSETTINGS(value)

Using this command the user's application can write the non-volatile vending settings, according to the byte at address 384 in memory map (page 6).

Command	Description
METWRITEVENDINGSETTINGS(value) **Requires METRESET after issuing this command, since the value is loaded only once, at start-up**	Writes the vending settings in the device's memory
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

29. Read current credit - METREADCURRENTCREDIT

Using this command the user's application can read the vending machine current credit

Command	Description
METREADCURRENTCREDIT	Reads the vending machine current credit. Below is an answer example when the machine has a credit of EUR5.20
Device response	
{"DeviceResponse":"ReadCurrentCredit","CurrentCreditValue":"520"}	

30. Setting RTC

Command	Description
METSetRTC(h,m,s,d,M,y,wd)	Set device internal RTC date/time - h = hour (must be in 24h format only) – 0-23 - m = minute – 0-59 - s = second – 0-59 - M = month – 1-12 - y = year - 00-99 - wd = week day – 1-7 (1 for Sunday, 2 for Monday, etc.)
Device response	
{"DeviceResponse": "Acknowledge","MessageID": 101} {"Error": "Syntax Error","ErrorCode": 1001} {"Error": "Unknown command","ErrorCode": 1002}	

32. Reading RTC

Command	Description
METGetRTC(h,m,s,d,M,y,wd)	Set device internal RTC date/time - h = hour (must be in 24h format only) – 0-23 - m = minute – 0-59 - s = second – 0-59 - M = month – 1-12 - y = year - 00-99 - wd = week day – 1-7 (1 for Sunday, 2 for Monday, etc.)
Device response	
{"DeviceResponse":"Acknowledge","MessageID":"101"} or {"DeviceResponse":"Negative Acknowledge","MessageID":"102"}	

C. Unsolicited messages

1. Vend request

This message is send by the device, every time the customer is selecting a product and there is a corresponding credit that covers the product's price.

Message
{"VMCMessage": "VendRequest", "ProductID": 7, "ProductPrice": 130, "MessageID": 103}
Description
This message contains informations about the last selected product on the vending machine's keyboard. - "ProductID" is the number of the latest product number selected by the customer (key number/selection number); - "ProductPrice" is the price of the latest product selected by the customer; - "MessageID" is the message ID number, always 103 for this message

2. Vend result

This message is send by the device, every time the VMC is finishing a transaction (product dispensed or product failed to dispense).

Message
{"VMCMessage": "VendResult", "ResultCode": "VendSuccess", "MessageID": 104}
Description
This message contains informations about the result of the last transaction. - "ResultCode" is the human readable transaction result and can be "VendSuccess" or "VendFailed" - "MessageID" is the message ID number, and it can be 104 for "VendSuccess" and 105 for "VendFailed"

3. Bill accepted

This message is send by the device, every time a bill is inserted into the bill validator and stacked.

Message
{DeviceMessage": "BillAccepted","BillAcceptedValue": 500}
Description
"BillAcceptedValue" is the value of the last accepted bill (in this example, bill of EUR5.00).

4. Coin accepted

This message is send by the device, every time a coin is inserted into the coin acceptor and sorted to a tube or to the cash-box.

Message
{DeviceMessage": "CoinAccepted","CoinAcceptedValue": 50}
Description
“CoinAcceptedValue” is the value of the last accepted coin (in this example, coin of EUR0.50).

5. Change requested

This message is send by the device, every time a change request is sent to the coin changer.

Message
{DeviceMessage": "ChangeRequested","ChangeRequestedValue": 150}
Description
“ChangeRequestedValue” is the value of the last change command sent to the coin changer (in this example EUR1.50). Value is 4294967295 if one of the conditions below are met (and the interface will not return change to the customer even if there is some credit remaining): - credit comes over the serial interface and not from inserted cash (let you control if you want to return change for cashless credit loaded by serial port) - machine is set for force vend and no product sold, yet - current cash credit is greater than maximum change set on the interface - there are not enough coins in the coin changer - if the change operation is inhibited by the interface settings Pressing changer escrow lever while the current credit is 0 will be ignored. No message sent in this situation.

6. Cashless finish session

This message is send by the device, every time the cashless device is finishing the session (cashless support removed).

Message
{"DeviceMessage": "CashlessFinishSession","CashlessCreditValue": 0}
Description

7. Cashless start session

This message is send by the device, every time the cashless device starting a new session (cashless support presented to the cashless device).

Message
{"DeviceMessage": "CashlessStartSession","CashlessCreditValue": 1250}
Description
- “CashlessCreditValue” is the value of the cashless credit available on the customer’s support.

8. Button pressed

This message is send by the device, every time a button is pressed.

Message
{"DeviceMessage": "ButtonPressed","ButtonNumber": 1}
Description
- “ButtonNumber” is the number of the pressed button (in this example, button #1)

Notes: