PICOVEND EZ
MDB PULSE CONVERTER
v1.001 - 8 prices

2025-03-28

Table of Contents

I. Introduction

This device was designed to facilitate connection of MDB payment systems to pulse operated vending machines.

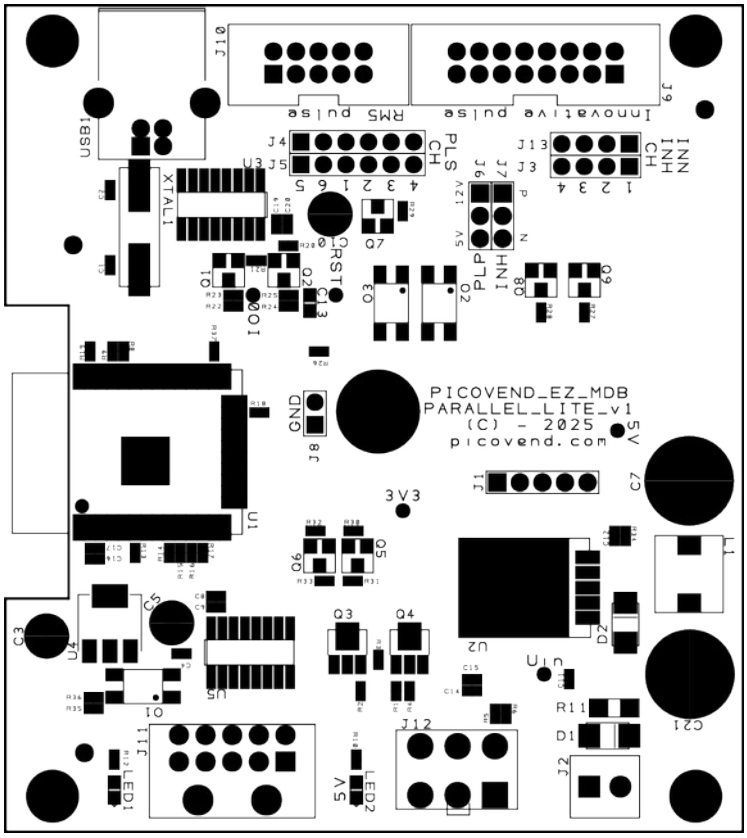
The interface can handle up to 8 buttons (NO – SPST) to select the amount that needs to be sent to the MDB card reader for authorization.

Standard package content:
- PICOVEND EZ MDB PULSE CONVERTER.
- Connector with wires for buttons. The wires are connected to a shell compatible with J11 on one side and free on the other end. You have to select your own buttons, according to your preferences (NO/SPST button).
- No other cables are provided (for example to connect to the VMC). You need to manufacture your own cable or buy them separately from a cable supplier.

NOTE!!! → This device can handle one MDB bill validator, one MDB coin acceptor and one MDB cashless devices (Level 2 or Level 3 with always idle cashless device), with up to 8 configured prices (maximum 8 buttons can be connected to this device).

II. Hardware

A. Board overview



B. Connectors description

1. USB1 – USB connector for interface programming

2. J10 (RM5 pulse) – This connector is used to attach the interface to the VMC (the vending machine controller). This interface is fully compatible with Comestero RM5 interface, with the following pinout:

- pin #1 – GND
- pin #2 – POWER
- pin #3 – Channel 5
- pin #4 – Channel 6
- pin #5 – N/C
- pin #6 – Inhibit
- pin #7 – Channel 1
- pin #8 – Channel 2
- pin #9 – Channel 3
- pin #10 – Channel 4
-

3. J9 (Innovative pulse) – This connector is used to attach the interface to the VMC (the vending machine controller). This interface is fully compatible with Innovative Technology pulse interface (ex. NV9, NV10, etc.). Please follow the picture above to identify the pins, because the innovative Technology products are not following the standard IDC connector numbering. In the picture above, pins numbering are following the the exact Innovative Technology numbering (ex. pin #1 is pin #15 on standard IDC connectors numbering). Please be aware that wrong connections may lead to product

damages. If your VMC has a parallel/pulse interface matching Innovative Technology pinout, you only need a pin-to-pin cable to connect our interface to the vending machine.

WARNING!!! DO NOT CONNECT TO A VENDING MACHINE THAT HAS A STANDARD 16 PIN PARALLEL/PULSE INTERFACE. THAT WILL DEFINITELY DAMAGE THE INTERFACE OR THE VENDING MACHINE!!!

This connector has the following pinout (following the numbering in the picture above, where pin #1 is the squared pin):

- pin #1 – Channel 1
- pin #2 – Channel 2
- pin #3 – Channel 3
- pin #4 – Channel 4
- pin #5 – Inhibit channel 1
- pin #6 – Inhibit channel 2
- pin #7 – Inhibit channel 3
- pin #8 – Inhibit channel 4
- pin #9… pin #14 – N/C
- pin #15 – POWER
- pin #16 – GND

4. J2 – Power connector. Power applied to this connector feeds the MDB interface. Please note that you need 24VDC on this connector in order to power the MDB payment systems. Usually, the vending machine is providing 12VDC on parallel/pulse interface (either RM5 or Innovative Technology connector), that will not be enough to feed MDB payment systems. The interface is not working without applying power on J2. Connector pinout:

- pin #1 (squared shape pin in the picture above) – 24VDC input
- pin #2 – GND

5. J12 – Standard MDB connector (to connect needed MDB payment systems/peripherals).

6. J11 – Buttons connector. This connector is used to connect 1 to 8 buttons, each button can have a defined value.
Connector pinout (where pin #1 is the squared pin):

- pin #1 – Button 1
- pin #2 – Button 2
- pin #3 – Button 3
- pin #4 – Button 4
- pin #5 – Button 5
- pin #6 – Button 6
- pin #7 – Button 7
- pin #8 – Button 8
- pin #9 – Buttons common (GND)
- pin #10 – Buttons common (GND)

C. LEDs description

- **LED1** - When ON, this means the device is activated by the vending machine (enabled).
- **LED2** – When ON, this means the board is correctly powered from a 24VDC power supply.

D. Jumpers description

The board is equipped with some jumpers that allows the users to configure the functions according to their needs.

1. Configuring RM5 compatible interface pulse channel
In order to select the channel needed for pulse sending, “PLS CH” pins should be used (pin headers J4 and J5). To select a channel, you need to tie one pin on J4 with one pin on J5. The “PLS CH” header is marked with channels number (1… 6). If you need to send pulses on channel 2, you need to place a jumper where the “PLS CH” pin header is marked with “2”. You may place multiple jumpers, on multiple channels, if you need to send pulses simultaneously to more than one channel.

2. Configuring Innovative Technology compatible interface pulse channel
In order to select the channel needed for pulse sending, “PLS CH” pins should be used (pin headers J4 and J5). To select a channel, you need to tie one pin on J4 with one pin on J5. The “PLS CH” header is marked with channels number (1… 6), but only first 4 channels can be used for Innovative Technology connector, due to their devices limitations (only 4 channels available). If you need to send pulses on channel 2, you need to place a jumper where the “PLS CH” pin header is marked with “2”. You may place multiple jumpers, on multiple channels, if you need to send pulses simultaneously to more than one channel.

3. Configuring RM5 and Innovative Technology compatible interface inhibit working mode
Considering that some machines have different inhibit active levels, you can select the working mode for the inhibit input(s). Using J7 (“INH”), you can select active high or active low for the inhibit pin(s) working mode. Placing a jumper between the middle pin and “P” pin on “INH” (J7) pin header, will select active high working mode for the inhibit pin (standard). Placing a jumper between the middle pin and “N” pin on “INH” (J7) pin header, will select active low working mode for the inhibit pin (reversed).

4. Configuring the pull-up level
This is performed by using J6 pin header. We strongly recommend not changing the settings on this pin header, unless specifically instructed by the manufacturer.

5. Configuring inhibit channel for Innovative Technology compatible interface
The Innovative Technology devices are providing an unique inhibit control mechanism, by using 4 inhibit inputs, instead of the standard one pin. Therefore, you can select on which channel you want to receive the inhibit signal (1 to 4, corresponding to each output channel). For this purpose, you need to use “INN INH CH” pin header and place a jumper between J3 and J13, according to the inhibit input you need to monitor. You can also place jumpers on multiple input pins, according to your needs, if you want to monitor more than one inhibit input.

III. Interface software configuration

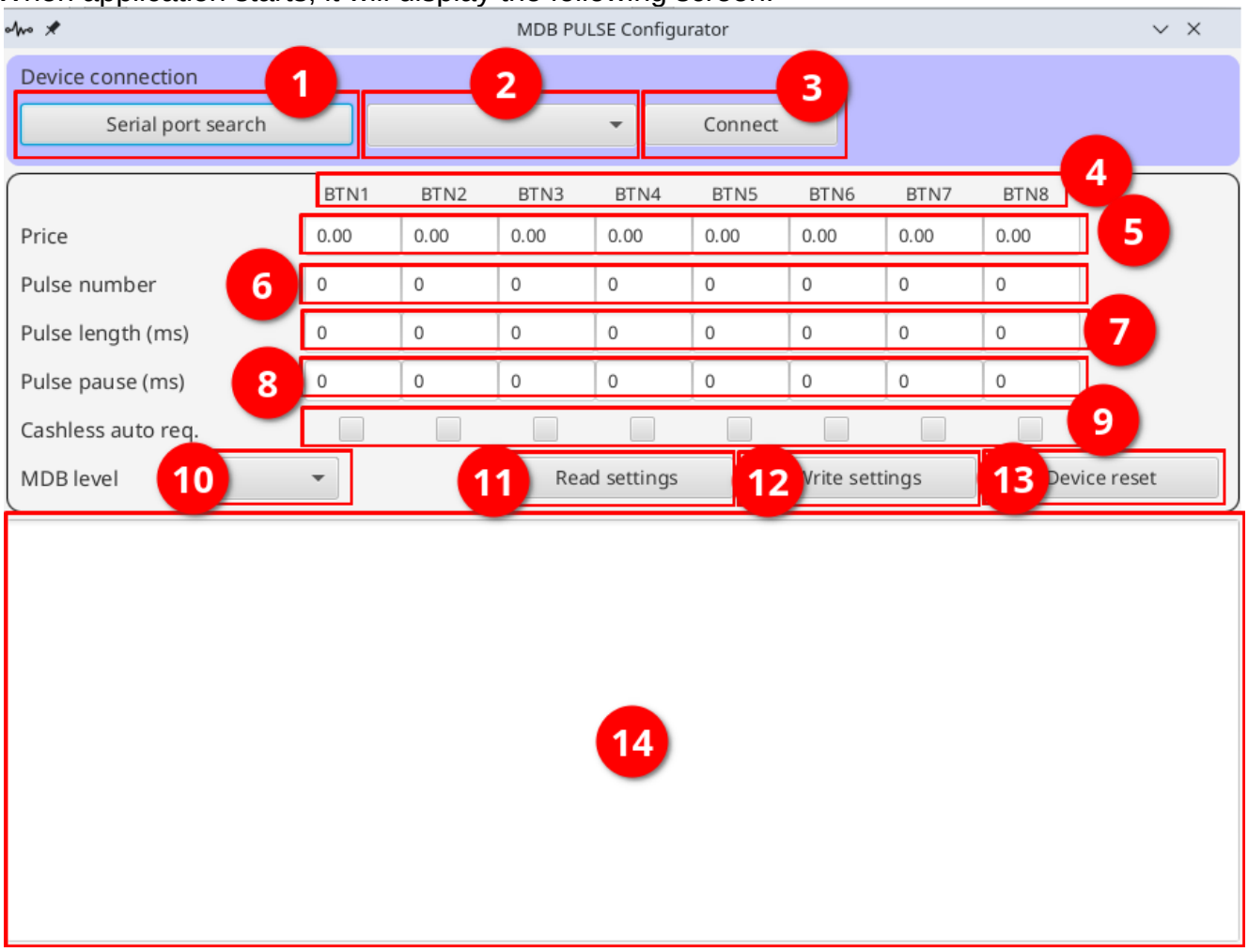
This chapter describes configuration software (used to set interface's internal running parameters).

Before starting the application, you need to make sure the interface is connected over the USB cable and the power is applied to the power connector. Connection to the vending machine and MDB payment systems are not mandatory, but connecting the MDB payment systems will help you to live test the settings. Also, for Windows, you need to previously INSTALL THIS DRIVER**.**

The application requires a previous installation of Java runtime (32 bit with JavaFX).

A. Initial screen

When application starts, it will display the following screen:



Screen elements description

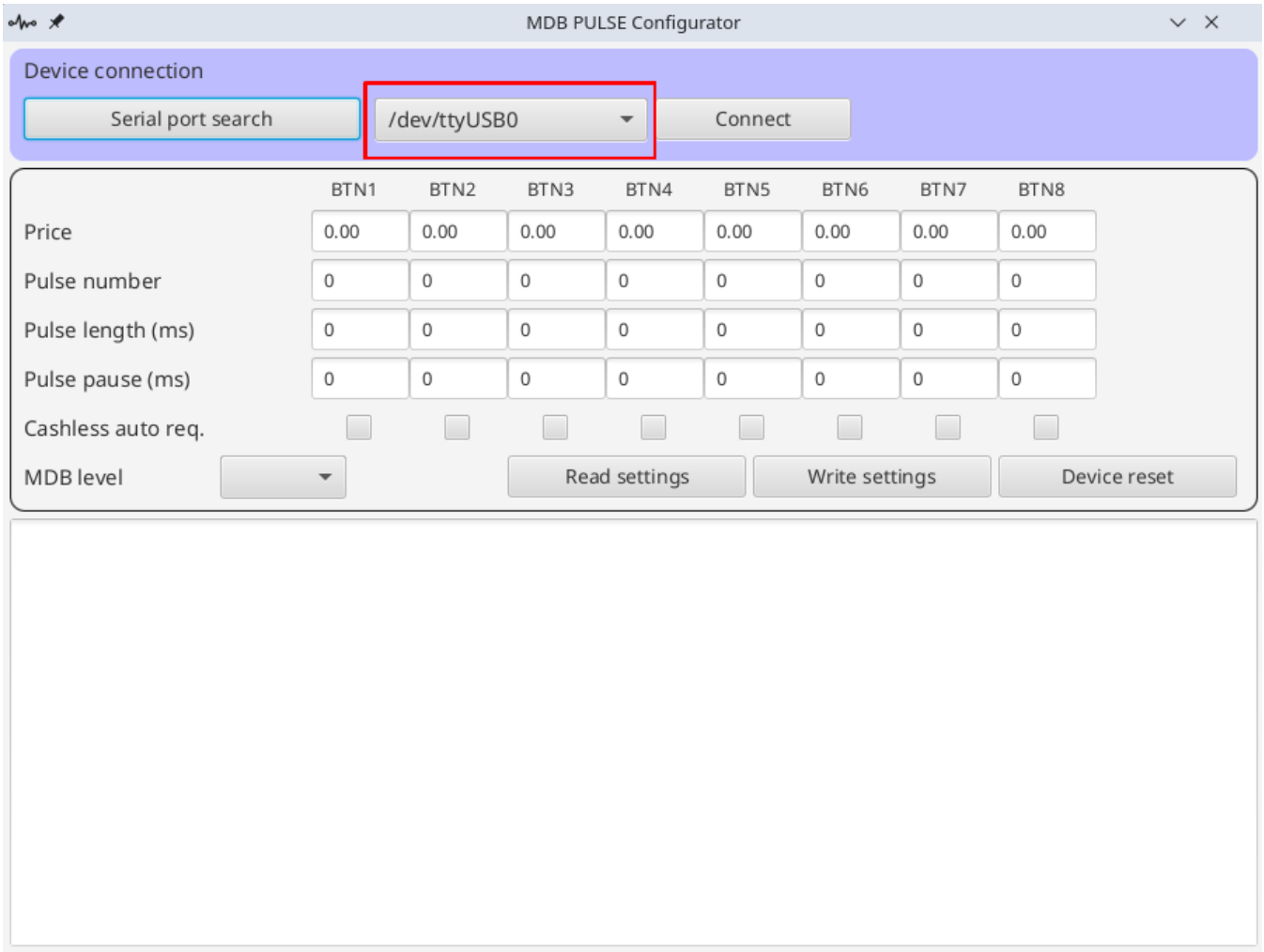
1. By pressing this button, the application performs a serial port search. If the interface is powered and connected over the USB, the application will detect it's serial port as well.
2. This is the combo list where you can select the correct serial port to connect. You must identify the serial port where the interface is connected using your operating system tools.

3. By pressing this button, the serial communication is opened on the the port selected in (2).
4. This labels identify the buttons for later configuration. Also, by clicking on any of this labels, you can simulate the corresponding button press, without physically connecting or pressing the buttons.
5. Each of these fields contains the price set for the corresponding button. All values must be set in ascending order. If the values are not set in ascending order, some of them may not be activated. For inactive buttons (if you are using less than 8 buttons/prices), you need to set the price and the pulse number to 0. This way, you are indicating that button/buttons are inactive and not used by the interface. **Important!!! All values must be in ascending order.**
6. Each of these fields contains the number of pulses to send when the corresponding price credit was accumulated.
7. Each of these fields contains the pulse length when the corresponding credit was accumulated. You can set different pulse lengths for each price/button. If the pulse length and pulse pause are set to 0, the interface will automatically pulse one second for each “Pulse number”, without any pause. This way, the interface can be used as a timer. For example, if you set length and pause to 0 and pulse number to 5 for credit 1.00, then the interface will keep the output (pulse) pin to GND for 5 seconds. An additional relay may be connected to the pulse pin in order to control high power devices. The maximum supported current for the pulse output is 100mA at a maximum 50V voltage.
8. Each of these fields contains the pause the interface will introduce between pulses, when multiple pulses must be sent for a price.
9. Using one of these fields, you can set the default price for cashless transactions. When one of those check-boxes is checked and the Level 2 cashless device is starting a payment session, the interface will automatically try to authorize and amount represented by the price of the checked button. If no checkbox is checked, then the interface will wait for a button to be pressed.
10. Using this combo list you can set the interface MDB feature level for cashless peripherals manipulation. The supported feature levels are 2 and 3. Level 1 cashless payment systems are not supported.
11. Read settings button allows you to perform a complete interface settings read.
12. Write settings button allows you to perform a complete interface settings write.
13. Device reset button allows you to perform a complete interface reboot, highly recommended after performing and saving settings modifications.
14. Details log window. In this area, the application will display various information (about reading settings, writing settings, sales while live testing, etc.). Please read those messages in order to have information about the interface configuring and/or testing process.

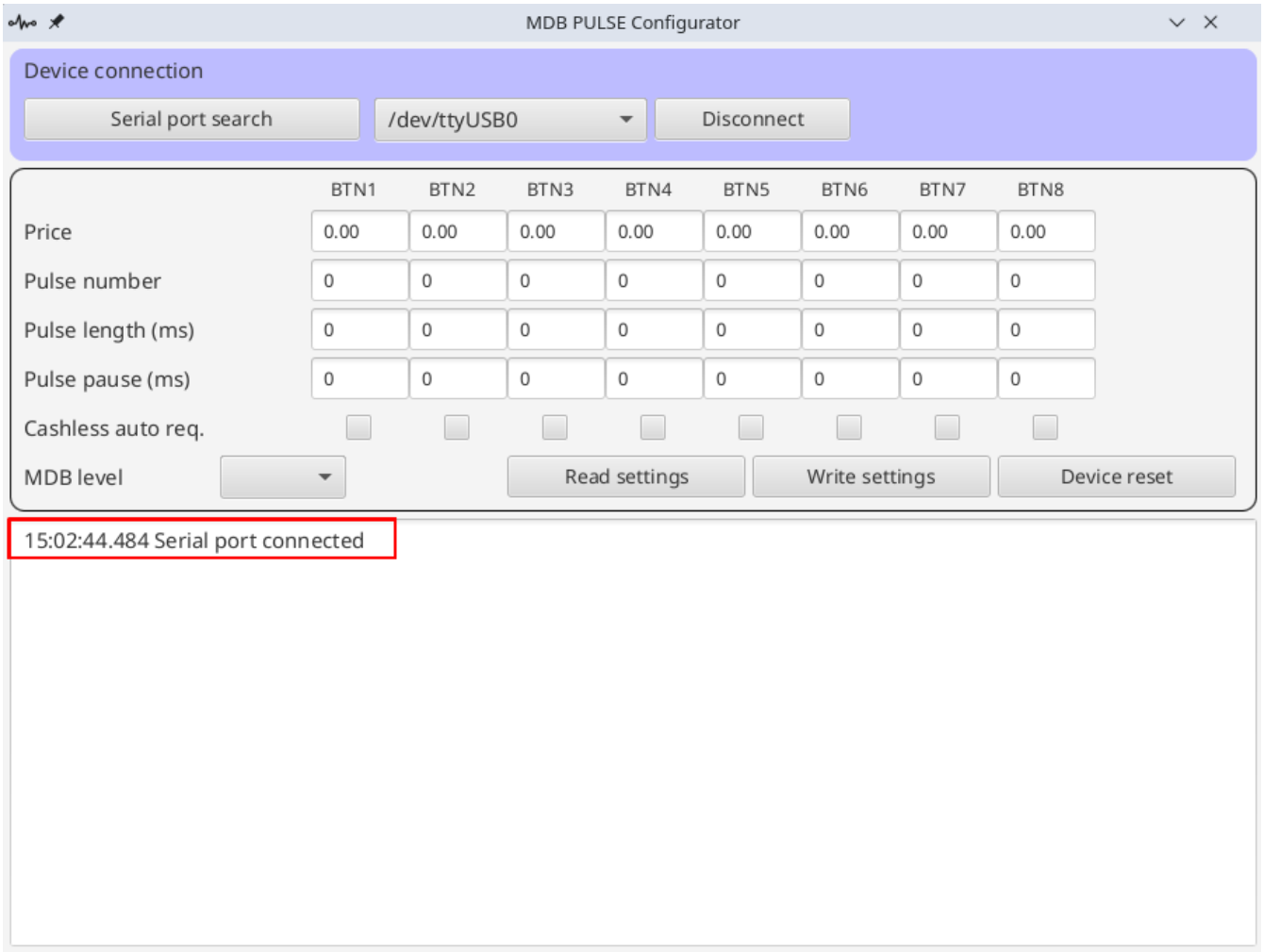
B. Connecting to the interface over the serial port

Before connecting to the interface, please make sure you have connected it by an USB-B cable and the power is active on J2.

1. Press the “Serial port search” button. The application will search for all available serial ports in your system and will populate the serial port combo list with all serial ports names (see picture below). The last detected serial port is automatically selected in the list. Select the correct serial port I this list, if required.



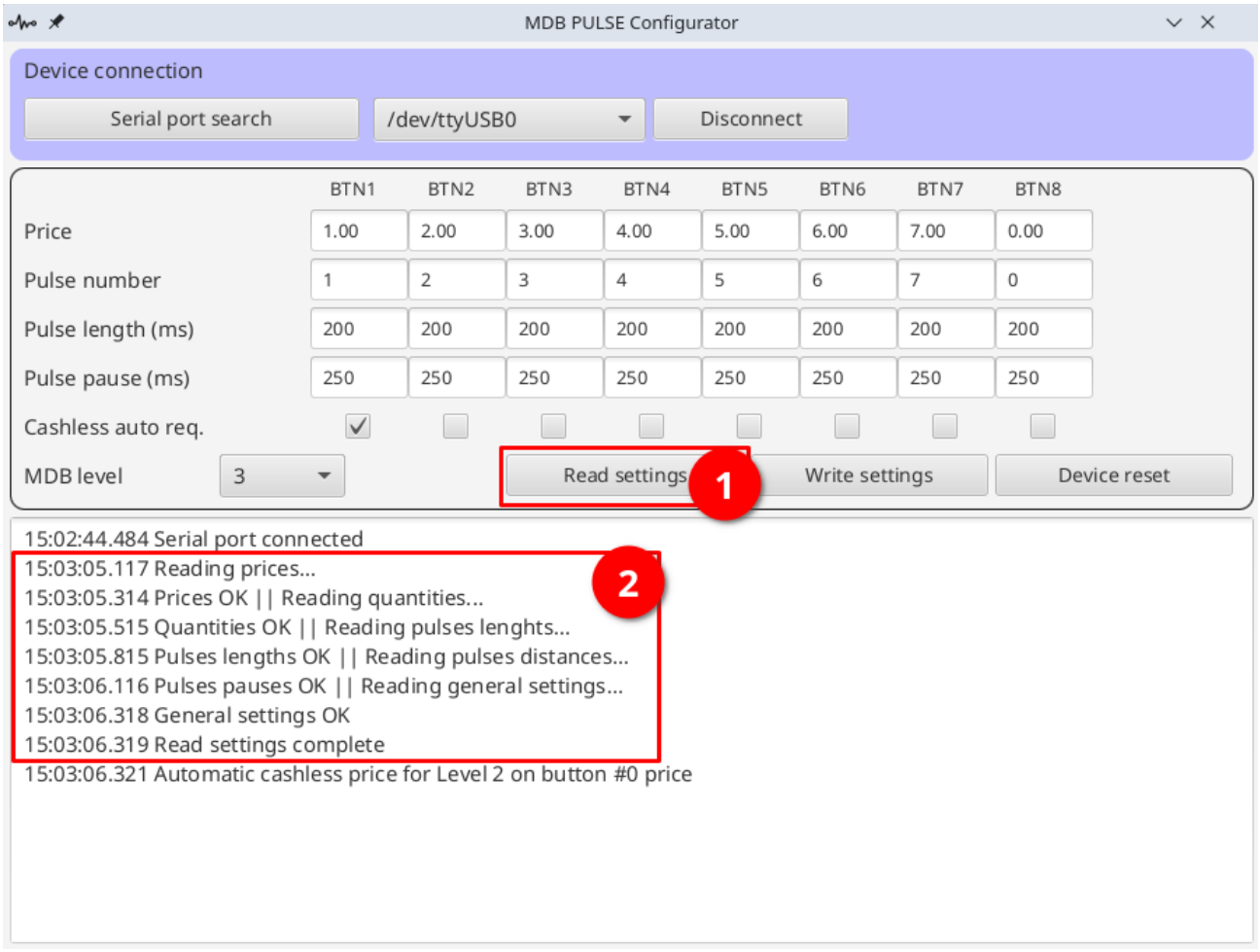
2. Press the “Connect” button. Once this button is pressed, the application will try to connect the selected serial port. If the serial port is successfully opened, a message will be displayed in the log window (see the image below).



3. Press the “Read settings” button.

The application reads interface current configuration and populates all fields. Usually, a complete configuration reading takes 2-3 seconds. If the application is not showing the messages in area no.2 (see image below), then, you may need to retry reading the configuration, but not before checking the following:

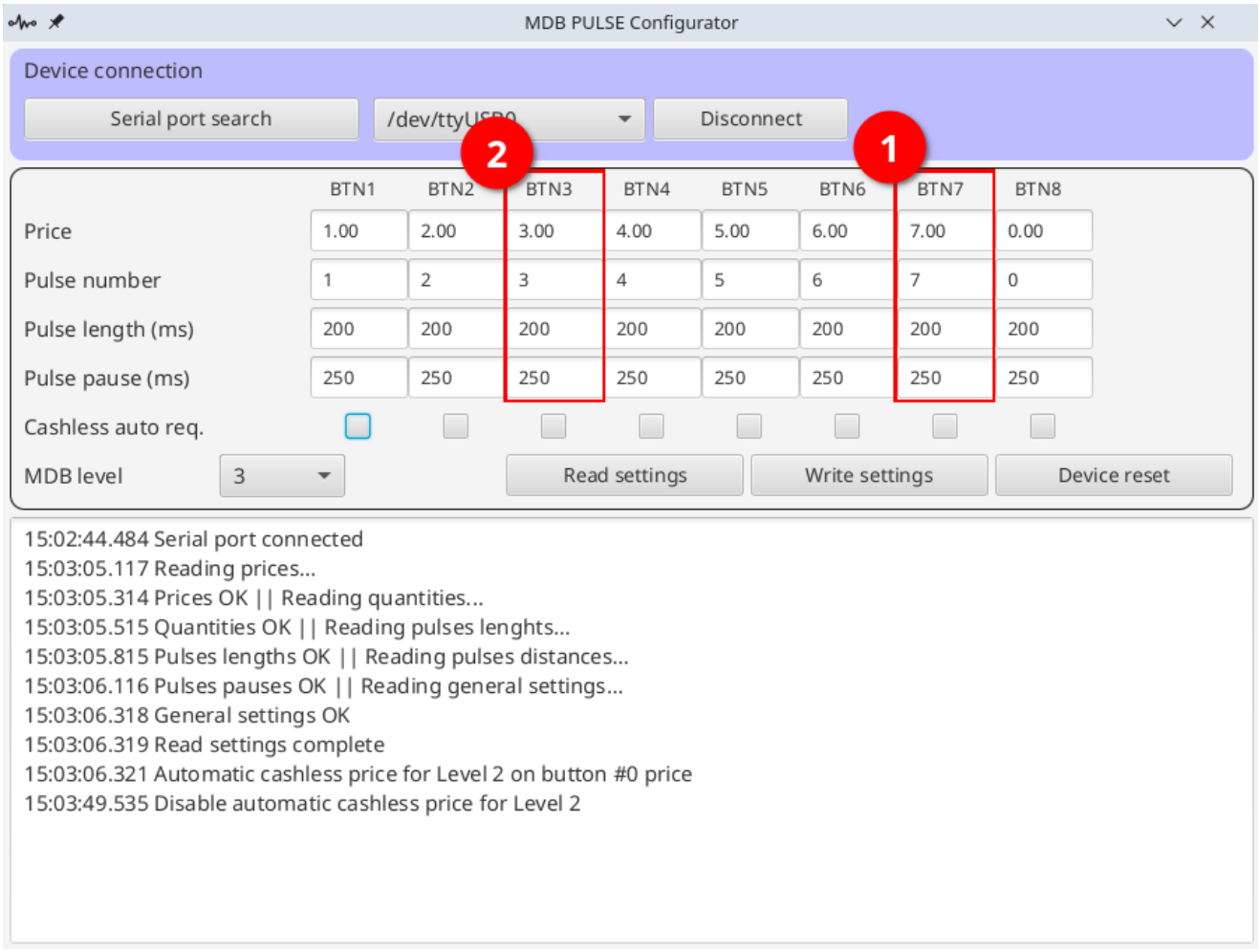
- the interface is connected to the computer with an USB-B cable;
- the interface is correctly connected to a 24VDC power supply, and the power supply is working;
- you have selected the correct serial interface for communication.



C. Cash sales

For cash payments, they are automatically performed, according to the configuration, right after the accumulated credit reaches one of the prices. You can set up to 8 prices.

If there is not exact matching price for the received cash amount, the interface will do it's best to use the entire amount, if there are some products that, cumulated, can reach the inserted amount value. For example, if there is no price set for a 10.00EUR bill, but there are other products that can match 10.00EUR together, they will be executed in a decreasing order. Obviously, if there is no cumulative matching combination, it will use maximum amount it can, the remaining amount is kept for the next transaction. This interface is not refunding the remaining amount as change.



In the above example, for a 10.00EUR bill, the product marked as (1) = 7.00EUR will be first executed, followed by the product marked as (2) = 3.00EUR. This way, the entire amount (10.00EUR) is used.

D. Cashless (card) payments

Card payments can be performed automatically or manually, using external buttons.

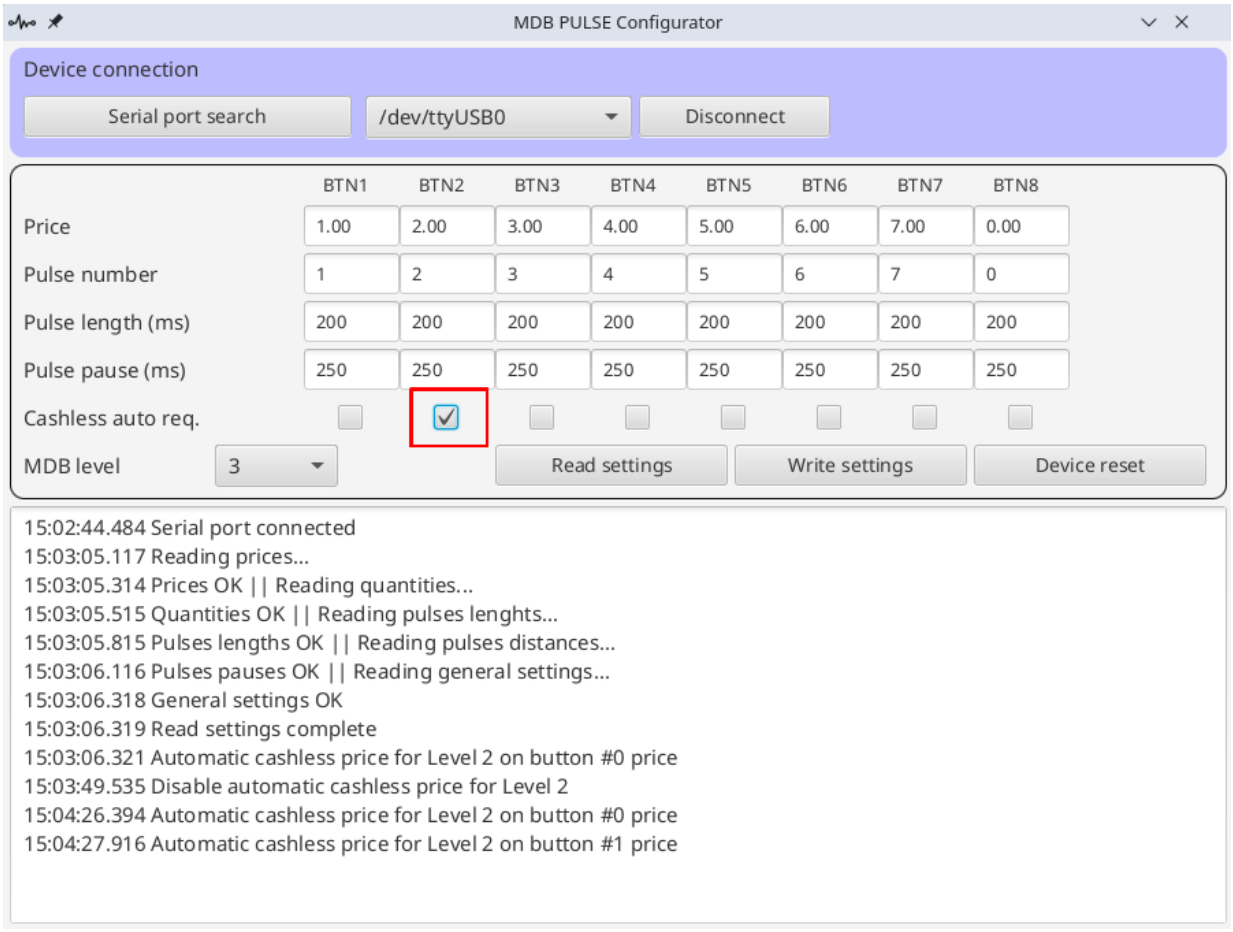
1. Automatic cashless sale

In order to perform automatic cashless sales, the following configuration conditions must be met:

- Interface (or at least the cashless device) should be set to Level 2. For Cashless device you need to disable the Always Idle mechanism if this one is not disabled by switching the device to Level 2 mode. Exception, when the cashless device is able to work in both Level 2 and Level 3 + Always Idle modes, situation where you must set the interface to Level 2, in order to activate the automatic cashless sale mode.

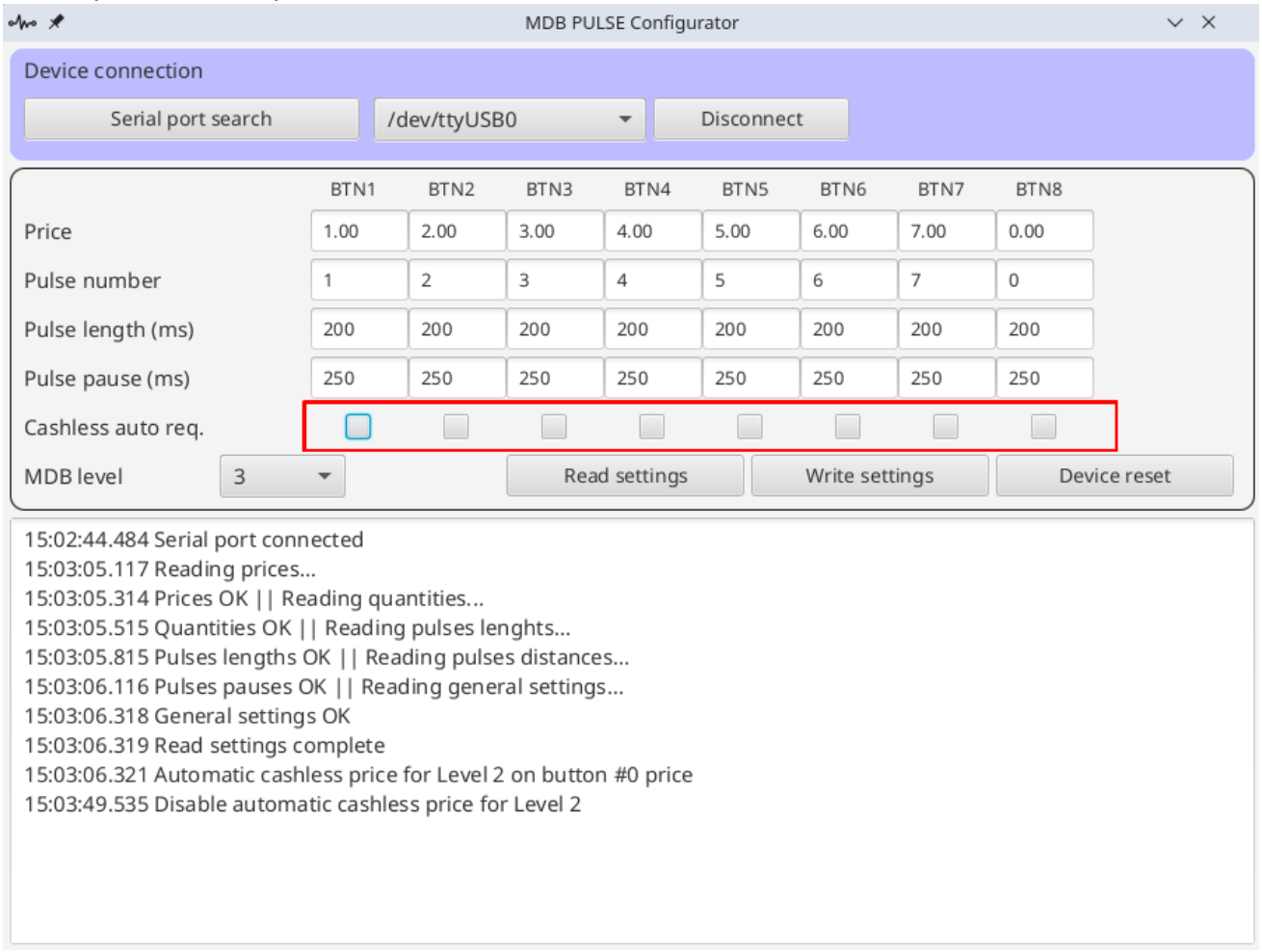
- One of the products (prices) must be checked for “Cashless auto req.”

If one of the above conditions are not met, then the interface will accept the transaction start (BEGIN) event from the cashless device, but will wait for the customer to select the product (using interface’s buttons). For the automatic cashless sale mode, the customer should start a cashless device by tapping the card or pressing a “Start” button on the cashless device. Sale will not be performed by pressing a button on the interface (products buttons), unless a cashless session was previously started by pressing “Start” button or tapping a card on the POS (cashless device). In the picture below, the automatic sale will be performed at 2.00EUR.



2. Manual product selection cashless sale

If you want the customer can manually select the price for the cashless transactions, using the interface buttons (1...8), then you need to deselect all products on automatic cashless sales (see the picture below).



If all the check-boxes are deselected, then the interface will require a product selection (by pressing one interface button), for any of the working modes:

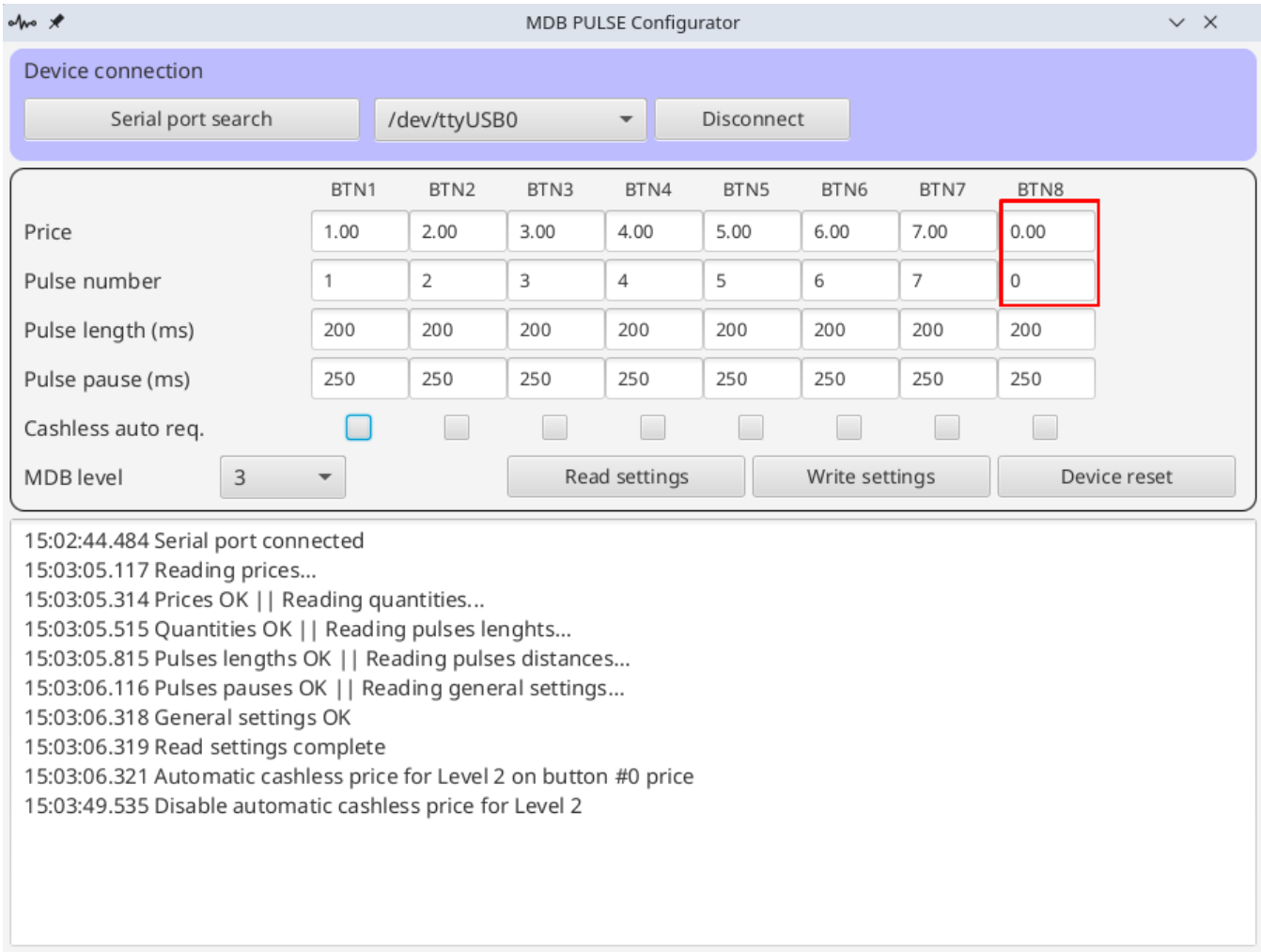
- Level 2 without Always Idle, after a session was started by the customer, pressing “Start” button or tapping a card, depending on the card reader configuration).

- Level 3 with Always Idle, anytime.

E. Other configuration information

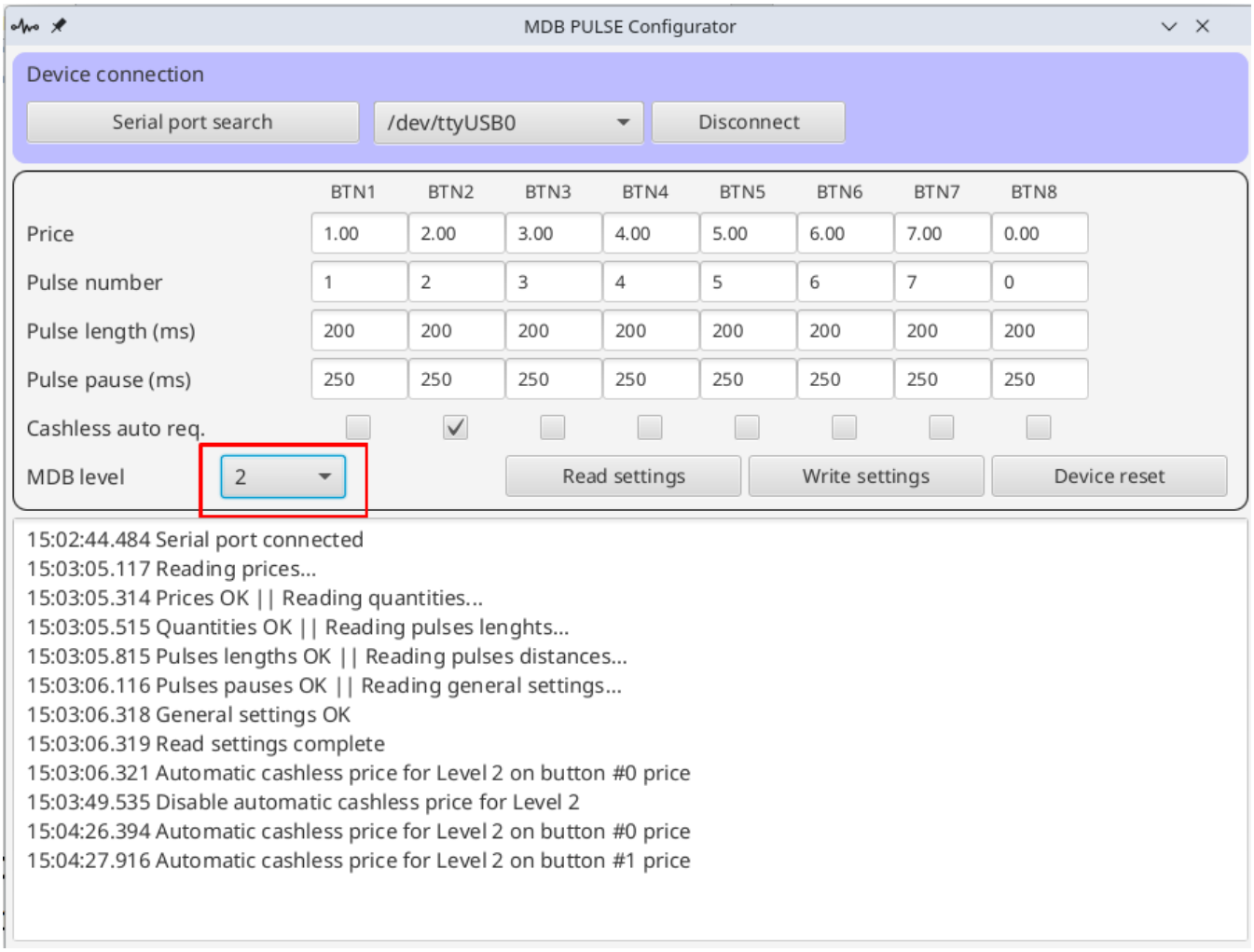
1. Disabling one or more products (buttons)

To disable a product, you need to set both price and pulse number to 0 (see the picture below, where product no.8 is disabled).



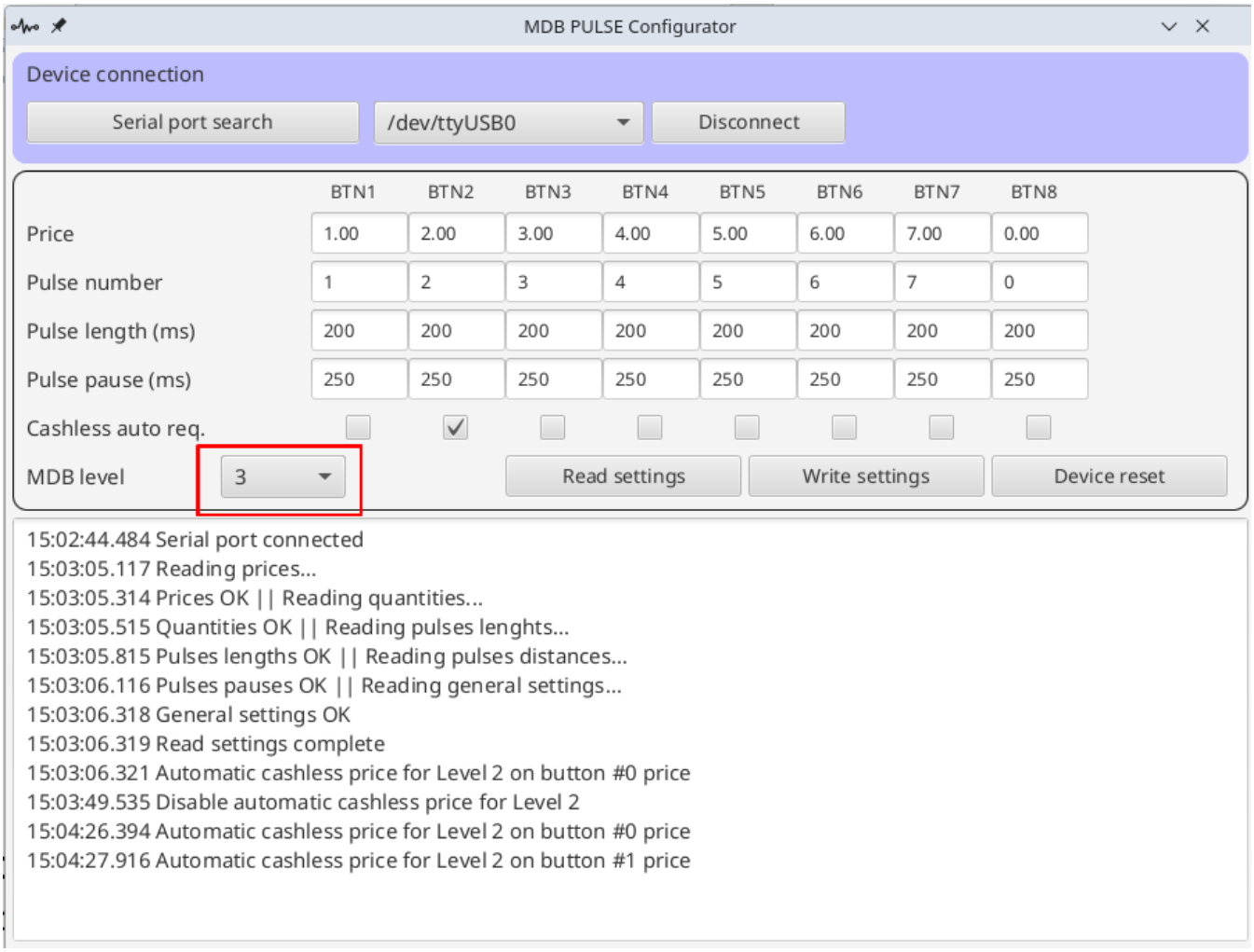
2. Setting the interface to MDB Level 2

To set the interface working as an MDB Level 2 VMC, you need to select “2” in MDB Level combo list (see picture below).



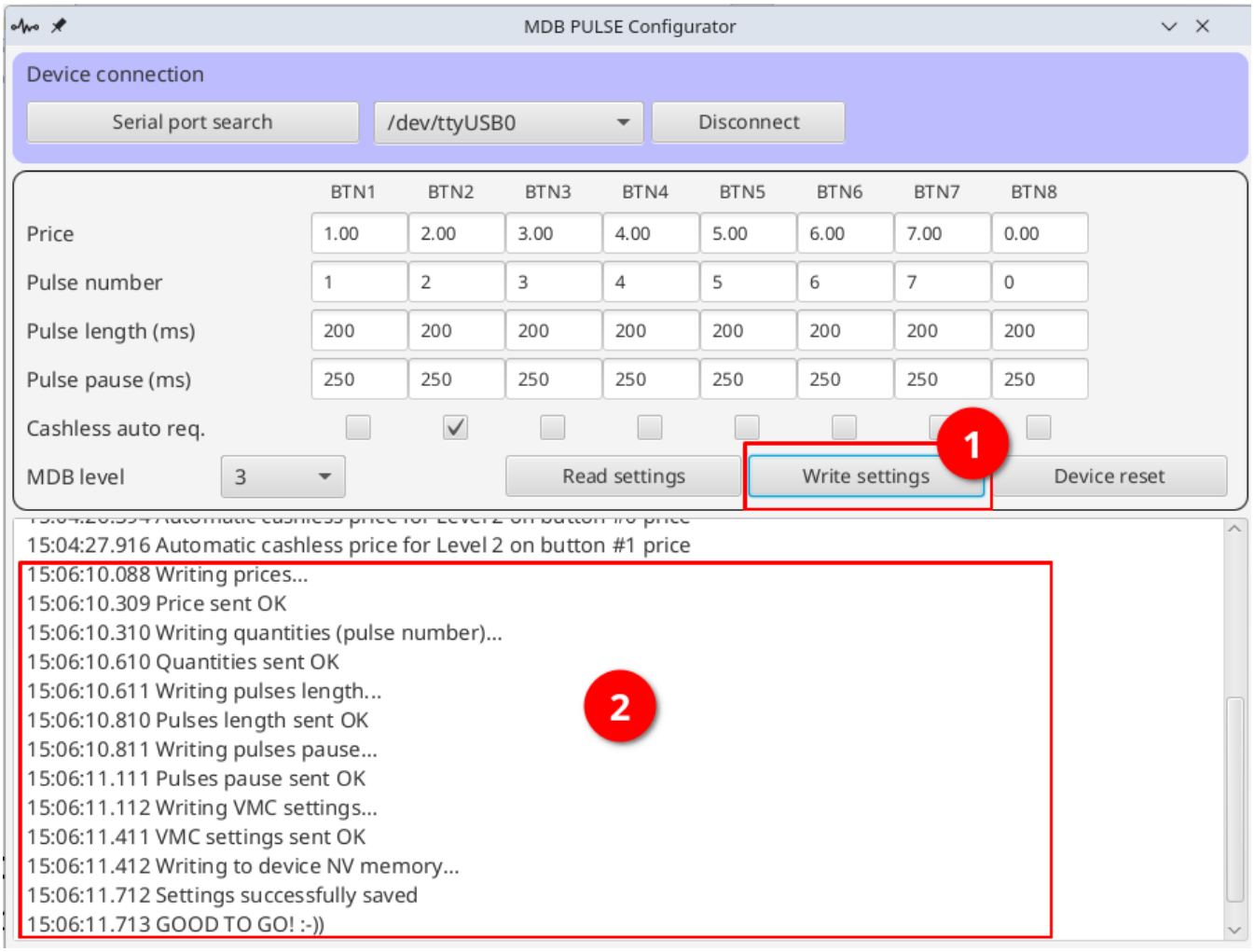
3. Setting the interface to MDB Level 3

To set the interface working as an MDB Level 3 VMC, you need to select “3” in MDB Level combo list (see picture below).



4. Saving interface working parameters

After modifying any working parameter, you need to save them to the interface. Configuration saving is performed by simply pressing “Write settings” - see picture below, action (1).



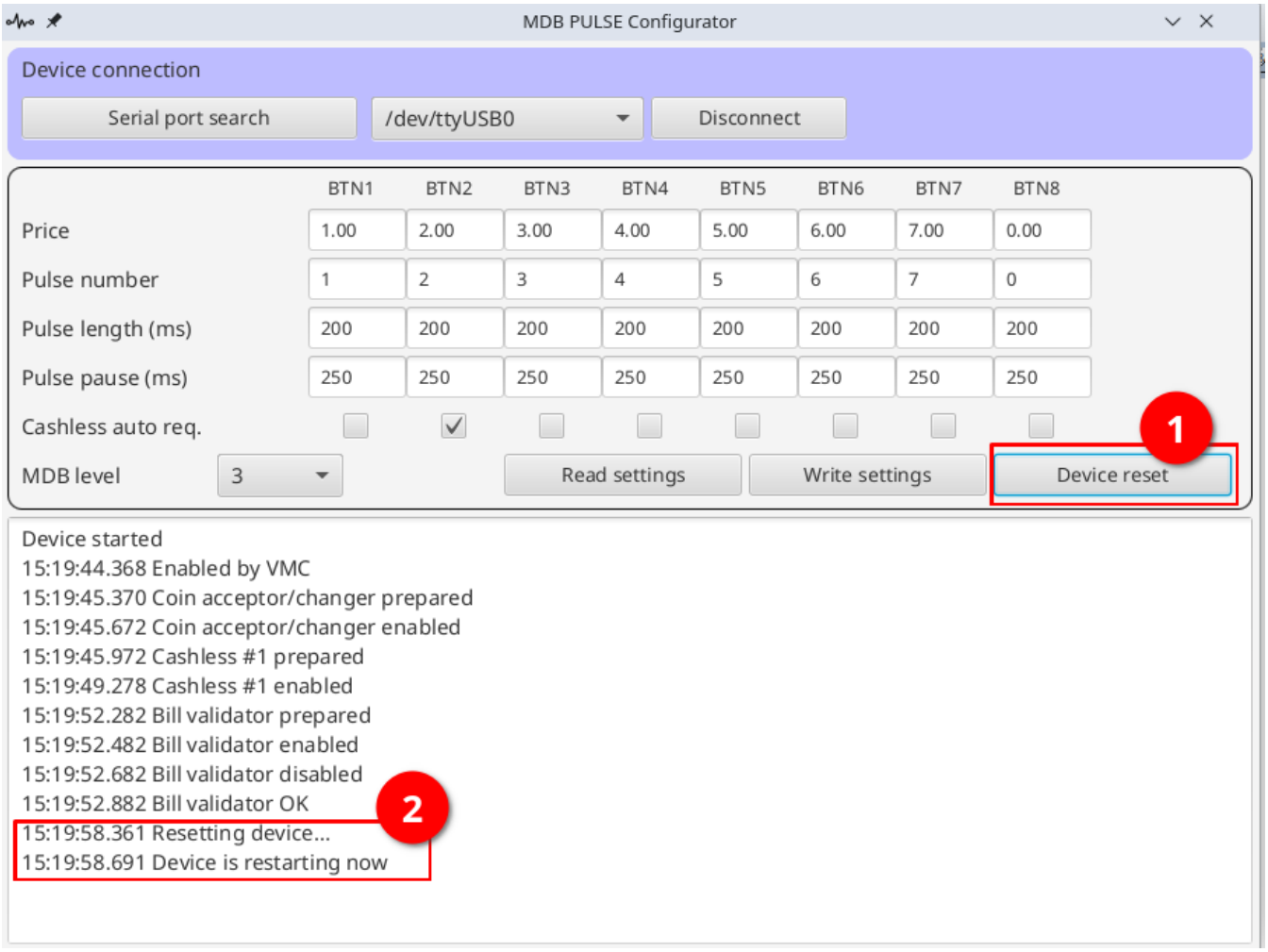
After pressing “Write settings” button, in the messages log you will be able to see the information about configuration saving stage - see picture above, area (2). When everything is fine and configuration saved, you will see “GOOD to GO!” message. The usual parameters saving operation is taking a maximum 4-5 seconds. If the saving procedure takes more than 10 seconds and you will not receive the “GOOD TO GO!” message, you may need to retry parameters saving procedure.

Important note!!!

The settings are not becoming effective on the interface if you are not saving them with “Write settings”. Device reset is also recommended after saving the settings.

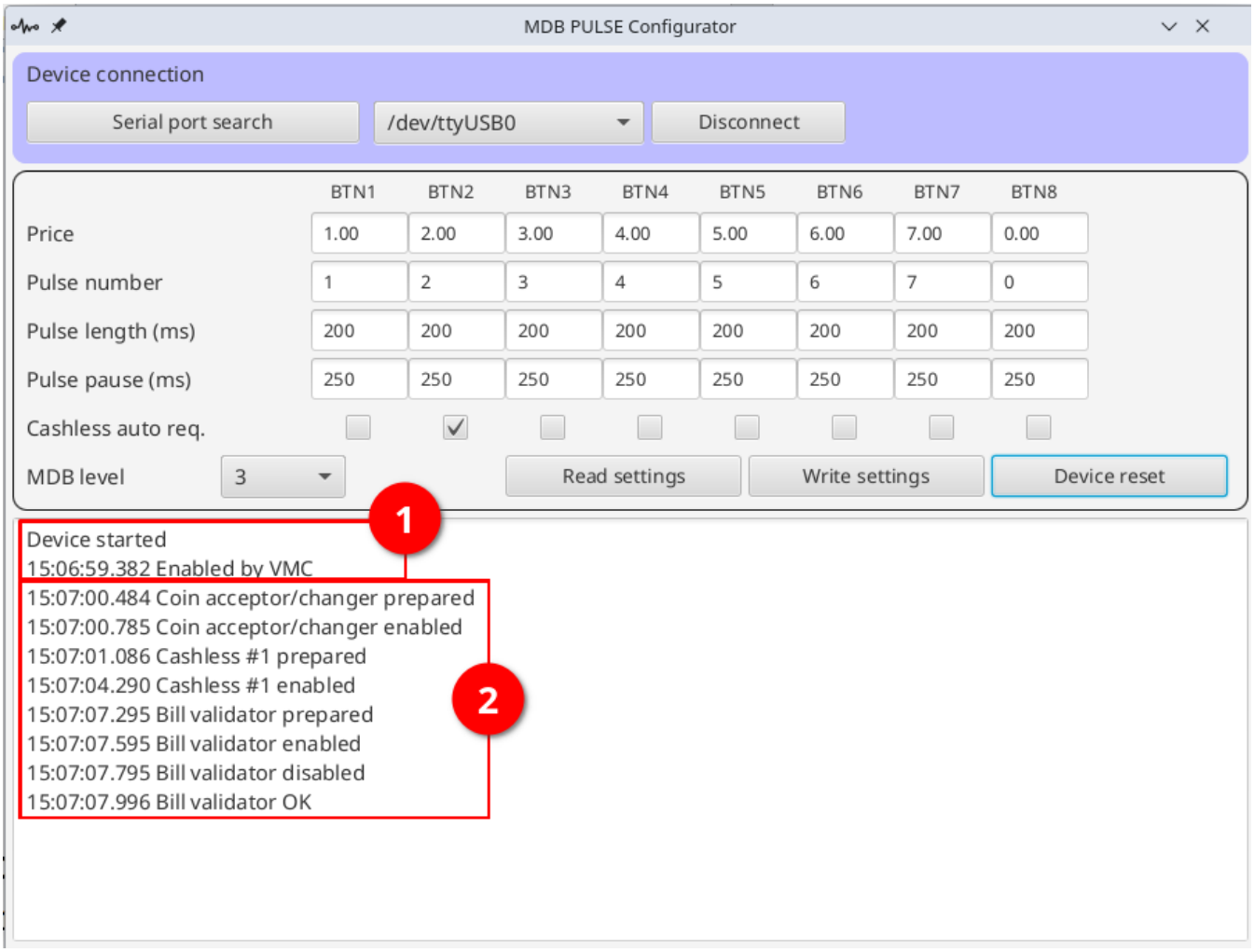
5. Resetting the interface (reboot)

After any configuration modification saved, it is recommended to reboot the interface. In order to reboot it without disconnecting it's power cable, you can use the "Device reset" button - see picture below, button marked as (1).



After pressing the button, if everything is fine, you will get the messages marked with (2) in the picture above.

When the interface reboots and starts again, the log area will be automatically cleared and you will get the messages marked in the picture below – area (1). Depending on connected machine's stage, you may receive "Disabled by VMC" instead of "Enabled by VMC". If the VMC is not connected, you will always receive "Enabled by VMC".



Depending on the connected MDB peripherals, after reset, you can also receive one or more of the messages in area (2), picture above.

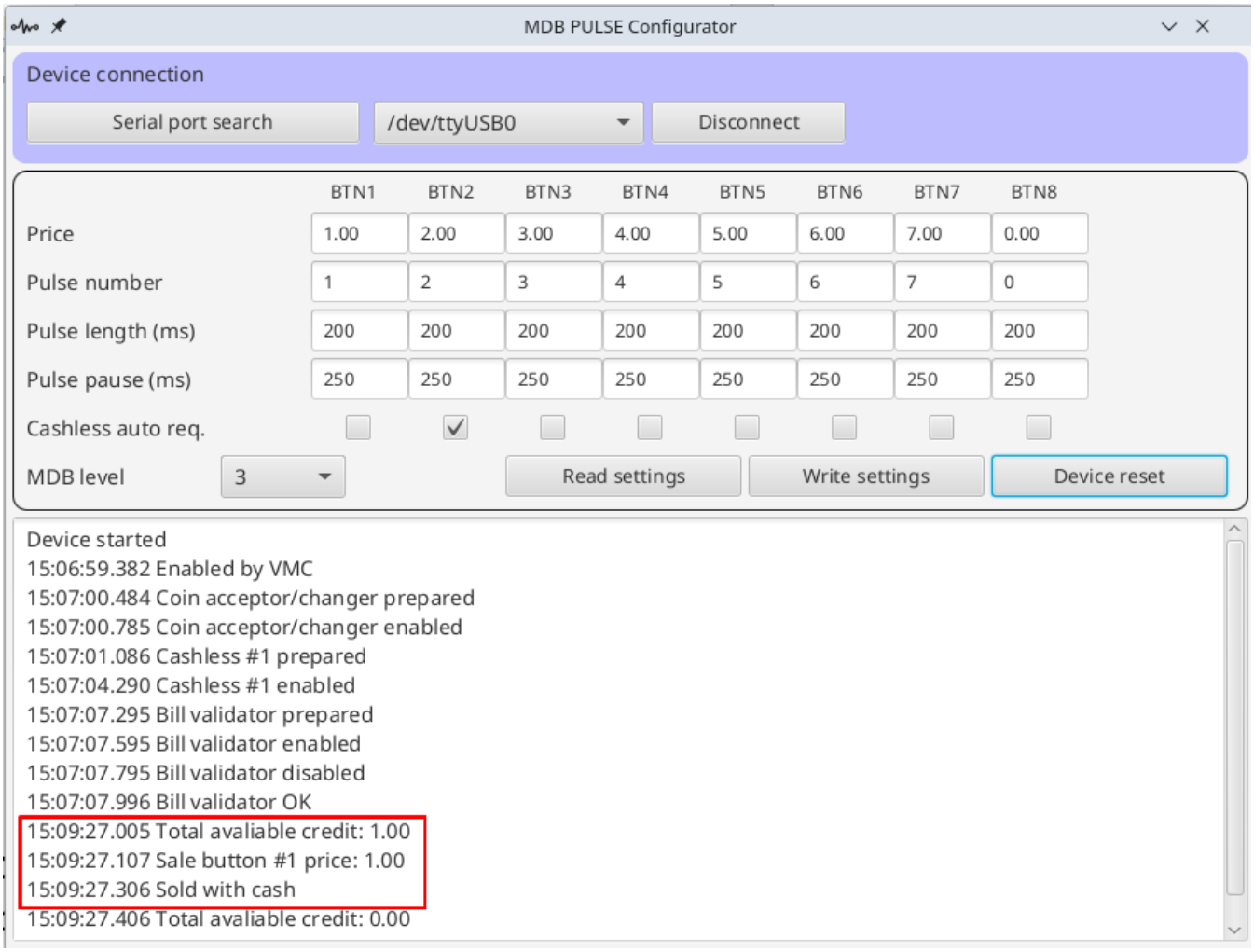
F. Testing configuration and/or MDB payment systems (MDB peripherals).

You may also use this application to test the saved configuration and the connected MDB peripherals (MDB payment systems).

1. Cash sale test

You can test cash sales by simply inserting coins and/or bills until the accumulated cash credit amount matches with one of the configured prices.

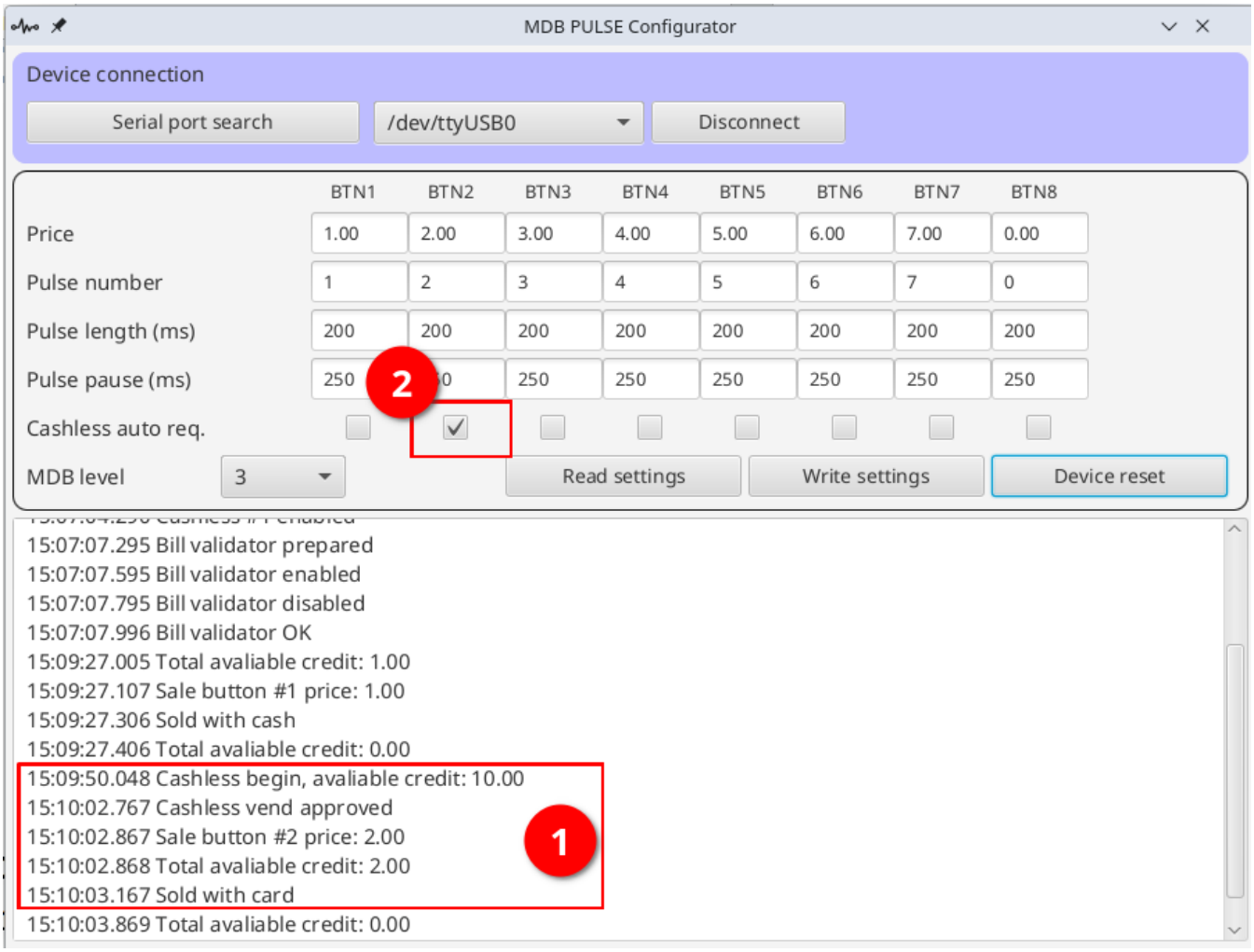
In the picture below, you can see the result of a cash sale (product automatically sold #1 – button 1).



The last information is about the sale type: “Sold with cash”

2. Card (cashless) sale test – automatic selection cashless sale

If you need to check the correct configuration, press “Start” or tap card to start a session (depending on your cashless device configuration). In the picture below, you can see a “Cashless begin” message with the available amount, after pressing “Start” or tapping a card on the cashless (POS) device. This only works if the cashless device can work in MDB Level 2 mode, without Always Idle mechanism. Some devices may support both Level 2 and Level 3 with Always Idle mechanism so, if you want to force this working mode, you will need to set the interface to Level 2 (“MDB Level” combo list set to 2).



If there is any cashless request option checked (no. (2) in picture above), after BEGIN, the interface will automatically request the corresponding amount (2.00EUR) for authorization to the cashless device. If the authorization message is a VEND APPROVED, then, you will see message “Cashless vend approved” in the log area. Otherwise, you will see “Cashless vend denied” message. If the transaction is approved, you will also see a message about the product automatically selected (in our example, product #2 – “Sale button #2 price: 2.00”).

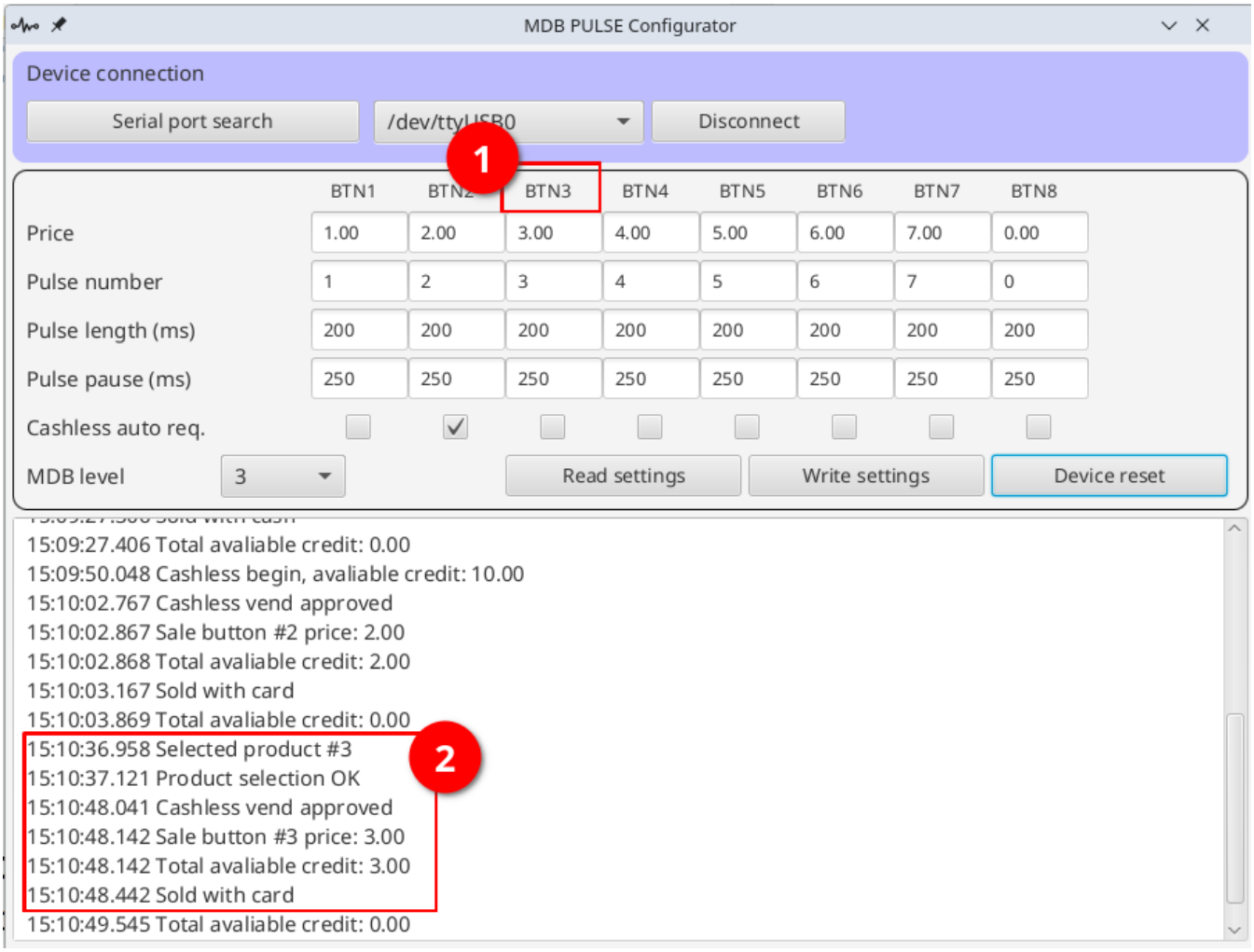
The last information is about the sale type: “Sold with card”.

2. Card (cashless) sale test – manual selection cashless sale

Manual selection cashless sale can be performed in both Level 2 and Level 3 (anytime if Level 3 and after a card session has been started if Level 2).

A card session in Level 2 is starting by pressing “Start” button or tapping a card on the cashless device (POS). Session cannot be started by pressing product selection buttons on the interface. Direct product selection on the interface is only available in Level 3 mode (both the interface and the cashless device - POS), with Always Idle mechanism enabled on the cashless device.

In order to initiate a manual product selection, you need to press a button on the interface or the corresponding product label in the configuring software (see picture below – area (1)).



In the picture above, area (2), you can see a message after product selection (“Selected product #3”), another message (“Product selection OK”) that is confirming the selection was a valid one. And the payment confirmation and execution, ended by the “Sold with card” message. If the selected product is disabled (both “Price” and “Pulse number” are set to 0), you will receive the message “Product selection failed” after pressing the physical button or selecting the product in labels (1) area.

This page is intentionally left blank

NOTES: