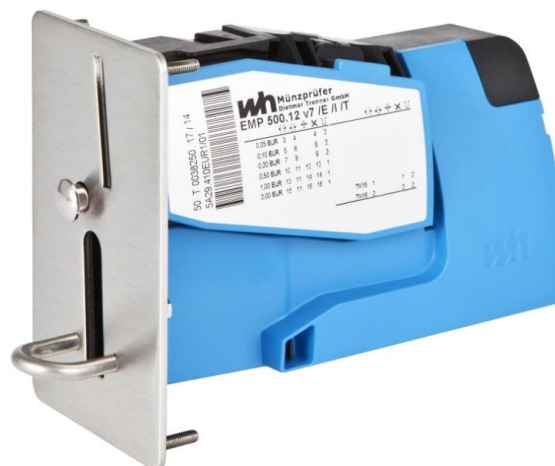

Technical Manual

ELECTRONIC COIN SELECTOR
with Cashless/Bluetooth
EMP 500 v7 /CLB

with parallel or serial interfaces

and optional
totalizer function

- version 2.8 -



0. Safety Precautions

You are advised to observe the safety information during operation, maintenance and repairing of electronic coin selectors of the EMP 500 v7 /CLB series. Failure to do so may result in warranty and other claims being excluded.

Whilst every care has been taken in the preparation of information contained in this manual, WH Münzprüfer Dietmar Trenner GmbH will not be liable for any consequential loss or damage howsoever caused.

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The Company would be very grateful if any accidental inaccuracies could be pointed out to us with any other constructive criticism which might lead to a better understanding.

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1. Introduction

The EMP 500 v7 /CLB offers multiple payment methods in one device. The unit accepts coins and cashless payments. Developed to be more flexible and to make e.g. laundrettes more convenient for users and operators. The solution is supported by Android and IOS applications for mobile devices with Bluetooth technology and mobile network.

Payment at the machine can be done with the easy-to-use wh Münzprüfer's "cashless laundry" app and supports PayPal and credit card payments. Alternatively, the payment can be carried out with coins or an RFID-key.

The EMP 500 v7 /CLB coin selector enables the operator to increase the number of accepted payment methods within the same device. It is retrofittable to previous EMP 500 series. No modification of the machine is required.

When retrofitting, mobile app payments allow flexible pricing. The price is to be read from the display of the machine and then adjusted in the payment screen of the app. Flexible payment with RFID-key is not possible. Alternatively, a fixed pricing of the machine is possible. Here both cashless options are possible, RFID and app payment with the wh cashless app.

The electrical outputs of the EMP 500 v7 /CLB have been especially designed to facilitate the substitution of mechanical coin selectors such as W 2000, W 6000 and W 7000 and electronic coin selectors of the EMP 500 v5 and v7 series, ensuring that only with minimal technical amendments are required. We offer a range of front plates to ensure that no alteration of the front plate cut-out is required on the machine.

The coin selector has an operation voltage of 8 to 30 DC or 12 to 24 AC and is fitted with switching outputs that – depending on version used – can totally replace the micro switches or opto-couplers of the mechanical coin selectors.

In addition, the EMP 500 v7 /CLB can be supplied with an integrated totalizer function (EMP 500 v7 /CLB, interface 06). Via the serial programming connector, the selector can be operated with the MDB or the ccTalk protocol.

Compared to previous EMP 500 v5 models the EMP 500 v7 has a new mechanical design. The new design is even more solid and offers a higher security against vandalism.

The coin selector generation v7 offers a combined optical and inductive measuring system. The measuring system consists of various light barriers and coil alignments, which are located directly behind the coin insert in the flap and in the main body. It ensures a high coin acceptance rate and an optimum rejection of counterfeits.

The EMP 500 v7 /CLB is equipped with a sophisticated coin monitoring as a security provision against manipulation. Thus the EMP 500 v7 /CLB is the ideal choice for all machines even for applications with high requirements in regards to counterfeits detection and security against manipulation.

1.1. Technical Data

1.1.1. Interfaces of the EMP 500 v7 /CLB

The EMP 500 v7 /CLB has 32 in-built coin channels and has 2 output lines. The coin output assignment to the output lines can be freely programmed.

In addition, the coin selector offers a serial interface with different protocols. The serial interface can be used to connect a display to the coin selector also.

The various interfaces are described in greater detail in the chapters, 2.4, 2.5, 3 and 4.

Parallel Interfaces

- EMP 500 v7 /CLB IF: **00**
2 open collector outputs
30 V, 100 mA, $U_{CEsat} < 800$ mV
- EMP 500 v7 /CLB IF: **01**
2 solid state relay outputs
60 Vac, 600 mA
- EMP 500 v7 /CLB IF: **04**
2 galvanised separated infra-red opto-coupler outputs, output transistors closed in standby
35 V, 20 mA, $U_{CEsat} < 200$ mV (at 1 mA)
- EMP 500 v7 /CLB IF: **12**
2 galvanised separated infra-red opto-coupler outputs, output transistors open in standby
35 V, 30 mA, $U_{CEsat} < 1$ V
- EMP 500 v7 /CLB IF: **1206**
coin selector with totalizer function, 2 galvanised separated infra-red opto-coupler outputs, output transistors closed in standby, input general blocking
35 V, 30 mA, $U_{CEsat} < 1$ V
- EMP 500 v7 /CLB IF: **0106**
coin selector with totalizer function, solid state relay outputs
60 V AC, 600 mA
- EMP 500 v7 /CLB IF: **1207**
coin selector with timer function, galvanised separated infra-red opto-coupler outputs, output transistors closed in standby, input general blocking
35 V, 30 mA, $U_{CEsat} < 1$ V

Serial Interfaces

- EMP 500 v7 /CLB IF: **13**
The programming connector of the coin selector supports the serial Multi Drop Bus (MDB) protocol, the ccTalk protocol and the SCI (serial communication interface). The serial interface can be used to drive a

display too. The hardware of the serial interface does not match the ccTalk or MDB specification.

There are 32 available coin channels – 16 master channels and 16 slave channels. The slave channels can be freely linked to the master channels. They always have the same coin value and the same coin outputs as the master channels. In general, they are used for the wide and narrow settings.

The electronic coin selector EMP 500 v7 /CLB series can be programmed through the serial interface. The Windows™ software wheasy 5 is available for these procedures.



wh Münzprüfer maintains a policy of continuous research and development and unconditionally reserves the right for technical modifications with respect to the EMP 500 v7 /CLB series coin selector and the wheasy 5 software.

The electronic coin selector EMP 500 v7 /CLB is available with the following front plates:

Front plate F 503	117 x 60 mm	(height x width)
Front plate F 504	129 x 52 mm	
Front plate F 68.51	88.5 x 100.8 mm	
Front plate F 507	114.5 x 84 mm	
Front plate F 70.5	95.25 x 57 mm	
Front plate F 77.5	103.1 x 104.9 mm	
Front plate F 97.5	90.4 x 99.3 mm	



EMP 500 v7 /CLB with front plate F 70.5



EMP 500 v7 /CLB with front plate F 503

1.1.2. Technical Overview of the EMP 500 v7 /CLB

coin acceptance	32 coin channels, 16 master and 16 slave channels
coin blocking	Individual coin or group of coins can be blocked through DIP switches. The 16 switches can be freely assigned to each of the 32 coin channels. Each channel can be assigned two switches. General blocking via potential free opto-coupler input (option), max. blocking voltage 60 volts.
output signals	Two coin output signals, open collector, opto-coupler or solid state relays. Each output line can be freely assigned to any of the 16 master coin channels through programming. The number of coin pulses per coin can be freely programmed as well.
output pulse length	1 ms ($\pm 2\%$) to 65 seconds, programmable, pulse / pause interval programmable.
supply voltage	10 to 30 V DC 8 to 30 V DC (nur EMP 500 v7 /CLB interface: 16) 12 to 24 V AC These are the absolute limiting values. To ensure the undisturbed performance of the coin selector the applied voltage should be within these ranges and must never drop below or rise higher even in worst cases.
start up time	15 ms
rise of voltage	8 volts in less than 100 ms
power supply	90 mA current, peak current for approx. 20 ms 200mA
temperature range	+10°C to +70 °C
humidity classification	annual average $\leq 65\%$ relative humidity maximum 60 days per year 85% relative humidity no condensation
max. coin sizes	diameter: 30 mm thickness: 3.3 mm
dimensions	(without front plate) height: 80.1 mm width: 47.6 mm depth: 119.8 mm

Options

/E	extended temperature and humidity range temperature: -20°C to $+70^{\circ}\text{C}$, humidity classification: annual average $\leq 80\%$ relative humidity maximum 30 days per year 100% relative humidity remaining days maximum 90 % relative humidity
/I	inventory pulse
/T	teach mode (2 coin channels activated)
/U	potential free general coin blocking via opto-coupler through the machine controller

2. Function of the Coin Selector

2.1. Introduction

This chapter gives directions for preparing the EMP 500 v7 /CLB for programming. Please conform to all safety precautions before making changes to the unit.

Please note that all settings / programming of our electronic coin selectors may be carried out at the factory or by any authorised "wh Münzprüfer Service Centre." For a list with contacts please see also our website (www.whberlin.de).



Coin operated machines, as well as coin selectors are dangerous electrical devices. Always follow proper safety procedures when working with electrical devices. Please turn the power off before making or removing connections or otherwise performing work on the unit.

This manual assumes that the wheasy 5 programming manual and the programming software are available and that the operator is familiar with them. References here to wheasy 5 software, are only made relative to its specific application to the particular coin selector and its functions.

To power up the EMP 500 v7 /CLB and the associated PC interface, we strongly recommend our N 789 power supply for this purpose. The coin selector is connected to the dongle (interface converter) with the cable K 548 provided with the software to the N 789 power supply. The dongle is connected to an available USB port. See figure 1.

As shown in figure 2, the coin selector may also be programmed whilst in situ and powered by the vending machine. This procedure requires the use of the cable K 548 (See figure 2).

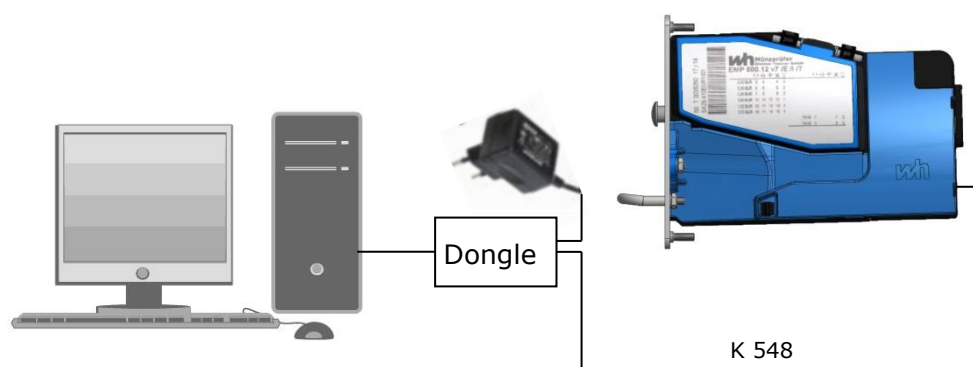


Fig. 1 Connection of the coin selector with the N 789 and the PC

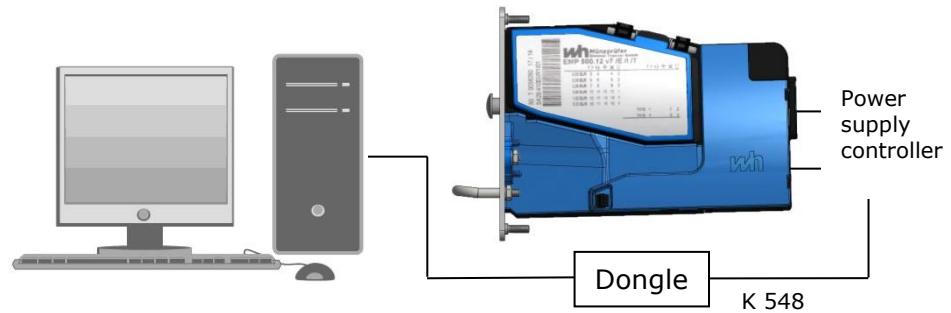


Fig. 2 Connection between a coin operated machine (controller), an installed coin selector and a PC



Every coin selector is fully tested and configured at the factory and is supplied ready for installation. Please make note of the factory settings, or alternatively, read and store them on the hard disk before making changes. The settings could be stored with a file name incorporating the serial number. The coin selector must be "read out" first and this procedure is explained in the wheasy 5 manual.

Please also note the information on the coin selector label.



It is important that the coin selector be located in an upright position when programming. Similarly, the bottom surface of the coin selector needs to be horizontal. This can often be achieved by mounting the coin selector in the same manner that it is mounted in the coin-operated machine. Alternatively, wh Münzprüfer can provide you with a purpose designed stand T 500.

The following sections detail each Windows™ software wheasy 5 related function of the coin selector. Each function has its own chapter as listed in the table of contents in this manual.

2.2. Programming Connector

The programming connector of the EMP 500 v7 /CLB is located at the end of the coin selector (please see figure 1 and 2). The connector is a 5-pin AMP connector type HE14. The connector has the following pin out:

PIN No.	Connection
1	GND
2	UB (8 ... 18 V DC)
3	CLK
4	TDO
5	RDI

The programming connector is also used for the serial interfaces as well as to connect the display D 500.

The following wiring diagram shows the serial interface located on the pcb of the EMP 500 v7 /CLB.

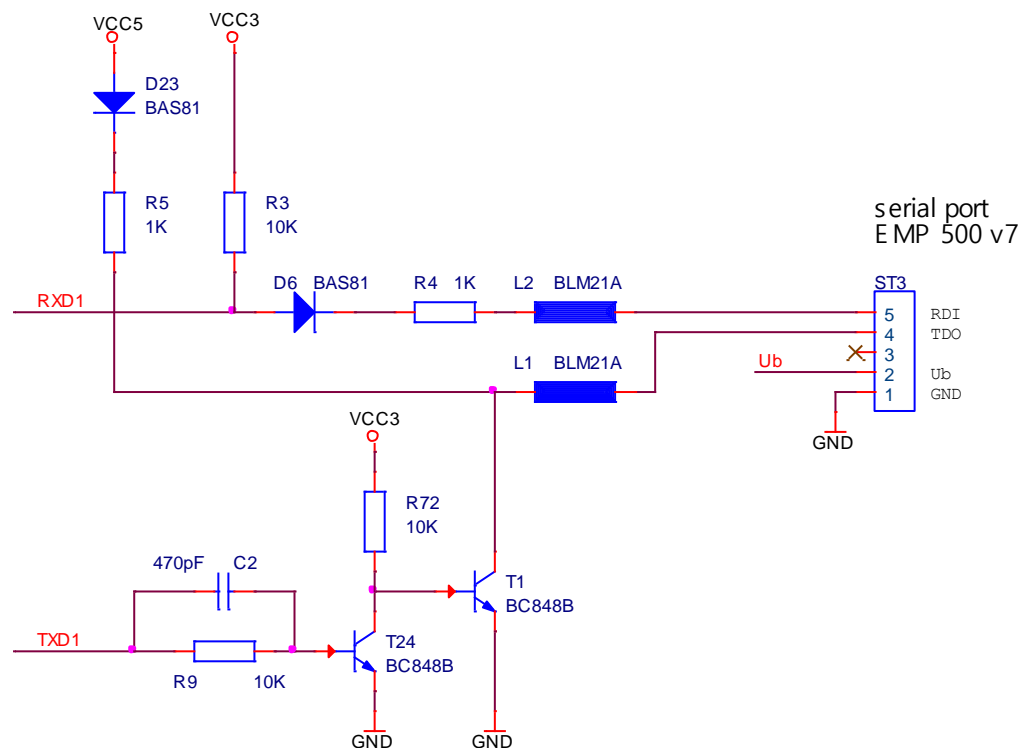


Fig. 3 Wiring diagram serial programming connector and machine interface

2.3. Programming of Coins

There are a variety of ways in which the coin acceptance of the EMP 500 v7 /CLB may be programmed.

The coin selector can “learn” new coin parameters, including individual tolerance requirements, with the help of the **Calibration Function**. Calibration is carried out either using the PC based wheasy 5 software or

directly in the coin-operated machine using the **Teachmode Function** (see On site programming).

Yet another alternative would be to transfer a previously prepared complete coin parameter data set from the PC to the coin selector. This is commonly referred to as the **Cloning Function**. This method is far less involved than calibration because it dispenses with the time consuming task of inserting coins. A pre-requisite however is that an approved and appropriate coin parameter data set is available. These may be acquired via the internet from WH Münzprüfer (info@whberlin.de).

2.3.1. Calibration

2.3.1.1. Calibration using wheasy 5

Under the Edit pull down menu is the function "Calibration". Pressing the <F4> key can also directly access this window. This will bring up the following window:

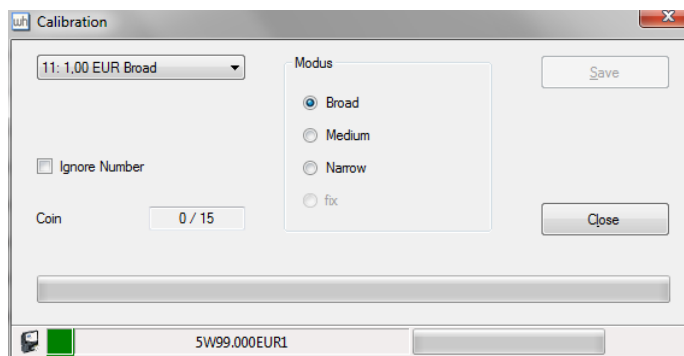


Fig. 4 Window Calibration

At the top left side a coin channel to be calibrated is selected. The coin value and currency code for the selected channel is displayed provided that it has been written to the file as being programmed to that channel. This is shown next to the channel number.

Not only the coin channel may be chosen but also the calibration mode. The calibration mode is activated for the chosen coin channel from the data set, it may be modified at any time until the end of the calibration.

The calibration mode "fix" is intended for use with coins and coin channels for which preset tolerance parameters are available and calibration mode "fix" is also preset. As a general rule, "fix" provides the best results when such information is already available.

The coin tolerances are automatically adjusted to the test coin set when "narrow", "average" or "broad" are chosen. This makes them particularly appropriate for the calibration of new coins or tokens in the absence of coin data sets.

Each of the calibration ranges approximates coin acceptance as follows:

narrow	approx. 95%,
average	approx. 98%,
broad	approx. 99%.

Obviously, the actual acceptance rate in a vending application may vary from the figures above. The level of variation relates directly to just how the coin set used for calibration is typical of the coins currently in circulation. Therefore, a mixture of older and newer coins must be used for this procedure. The coins must have no damages.

The number of inserted coins as well as the overall number of coins required is shown in the calibration window. The total number of required coins is determined by the data file. Calibration automatically ends once the required number of coins has been inserted and the procedure may now be finished or another coin channel selected for calibration.

If the checkbox "Ignore Number" is activated the calibration is no longer automatically finished once the pre-set number of coins is reached. It is possible to insert as many coins as desired. Following this, an additional channel can be chosen or the calibration procedure can be finished with the push bottom "close".

For the creation of a new coin or token channel, please select an unused channel from the existing 16 and assign a value and an output line. To do this, please refer to chapter 2.6 of this document. For the assignment of coin blocking DIP switches to this channel please refer to chapter 2.5. To accept the new coins or tokens of the new channel during testing with the polling function of wheasy 5 mark the respective checkbox (please see "Test" - "Coin Control").

2.3.1.2. Calibration Using the Teach Mode Function (Option /T)

The coin selector can be delivered with an optional teach mode function (on site programming). The teach mode can be set up for a maximum of 14 channels at the factory. No PC is required for the teach mode, since the necessary software is built into the coin selector.

The teach mode is activated by setting the number 8 switch on the left side of the DIP switches to "ON". The number 7 switch of the same DIP switch block is used to set the acceptance tolerance to "broad" or "narrow". The "ON" setting selects a narrow tolerance.

To start the calibration it is necessary to select a channel to be calibrated by setting one channel switch to "ON". The left DIP switch on the left side corresponds to channel 1 and right DIP switch on the right side corresponds to channel 16.

The coin channel must be chosen after activation of the teach mode switch 8. The advantage is that it is not necessary to set all DIP switches to "OFF" first before programming a particular channel.

Channels 7 and 8 cannot be calibrated with the teach mode because the DIP switches 7 and 8 are used to set the acceptance tolerance and to activate teach mode respectively.



Only 15 blocking switches are available on those coin selectors that have been factory set with the teach mode. The coin selector will not accept any coins while it is in the teach mode.

Figure 5 below shows the example of setting up channel 15 for calibration with narrow acceptance tolerances.

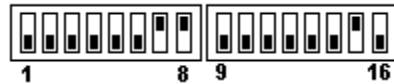


Fig. 5 Example DIP switch settings for teaching channel 15 with narrow tolerances.

The following procedure is for coin selectors with activated teach mode (factory setting):

1. The coin selector is configured, so that only **coin channel 15** and **16** (i.e. coin output lines 5 and 6) may be used for teaching.
2. The teach mode is activated via **blocking switch no. 8** (ON).
3. If **blocking switch no. 7** is activated additionally (ON), teaching is effected using **narrow tolerances**.
4. The **blocking switches 15** and **16** are used to teach **coin channels 15** and **16**. The switches have to be set to the OFF position when activating the teach mode, otherwise the coin selector software blocks the two channels for the teach mode.
5. If any coin blocking switches are activated (ON) for channels which are not released for the teach mode, the coin selector magnet will operate briefly three times to indicate an incorrect operation.
6. To program the coin selector with the teach mode a **minimum of 10 coins or tokens** must be inserted. When the requisite number of coins have been inserted and the teaching procedure has been completed (by setting the blocking switch no. 15 or 16 back to the OFF position), the coin selector solenoid will operate briefly and once only.
7. Should the coin selector establish an **overlapping** of the newly programmed coin with a coin / token already programmed, then the coin selector solenoid will operate briefly twice and no new data will be stored in the memory of the selector. If it is not possible to program the new coin / token with the setting "wide" (inhibit switch number 7 is on OFF), then it may be possible to program it in the narrow setting (inhibit switch 7 is ON).
8. **Insufficient coins** being inserted will result in the solenoid not operating and no new data will be stored into the memory of the selector.
9. The teach mode is deactivated via **blocking switch no. 8** (OFF). When the teach mode is deactivated, all blocking switches may then be used for individual coin blocking with the exception of blocking switch no. 8.

2.3.2. Cloning (Programming without coins)

Cloning is the fastest way in which to program a coin set. Using this method, coin parameter sets are transferred into the coin selector from the PC. It is also possible to transfer a coin parameter set from one coin selector to another thereby giving it nearly identical acceptance and reject rates. It does not make any difference whether the cloning data set is a wh original data set or whether it was copied from a coin selector and stored in the PC.

As a prerequisite to cloning, it is necessary for the coin measuring system of the originating coin selector to be the same as the measuring system of the target coin selector. wheasy 5 automatically compares the measuring configuration of the attached coin selector with the measuring configuration of the coin selector that produced the coin parameter set. Cloning is only accomplished if the two systems are indeed the same.

Other data sets are available from wh Münzprüfer if wheasy 5 does not allow cloning because of a mismatch in the measuring system characteristics.

Cloning can begin once the PC has been loaded with the cloning data set and when the coin selector has been connected. This function can be accessed by selecting "EMP cloning" from the "Data" pull down menu or directly by clicking



on the tool bar.

The following window opens up after selecting the function "EMP Cloning":

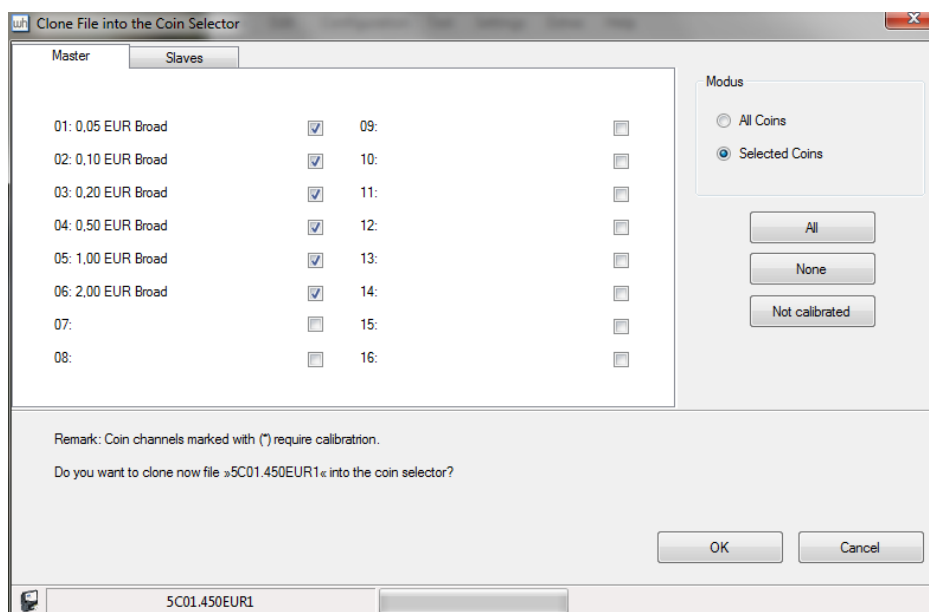


Fig. 6 Window "Clone EMP"

In certain situations it is possible to selectively clone individual channels. This can be carried out provided that the loaded data file is identical with the name of the file loaded from the coin selector. This we refer to as selective cloning.

Selective cloning is useful when the parameters for a specific coin are to be changed, or maybe a token is to be added without overwriting the fine tuning of other coins. With selective cloning all coin channels with activated coin boxes will be cloned.

The actual cloning process takes about 10 seconds after the OK button has been pressed (at 38400 Baud).

2.4. Coin Selector Output Signals

There are 2 parallel coin output lines on the EMP 500 v7 /CLB. They can be freely assigned in any combination to the 16 master channels. This means that each coin channel can have multiple output lines and that the number of pulses can be freely configured for each coin channel. One and the same output line or a combination of the output lines can be assigned to several coin channels. The 16 slave channels always have the same output line(s) as the associated master channel.

After accepting a coin or token the coin selector releases the corresponding number of pulses on the respective output line. The pulse width and the pulse pause of the coin output signal can be programmed in steps of 1 millisecond, between 1 millisecond and 65 milliseconds. The output lines are normally open. A pulse is signalled by making the output transistor conducting.

The pulse length can be programmed using wheasy 5 under "Configuration" - "Interfaces" and tab "Receipt".

The programming of the output lines for all coin channels 1 to 16 can be done via the menu point "Configuration" - "Interface" and tab "Output Lines" (see figure 7).



If no output line is assigned to a coin channel and a coin is accepted, the coin selector does not release a coin signal via the parallel interface. As an alternative a credit signal can be released as an inventory pulse. The assignment of inventory pulses is done on the tab "Output Lines".

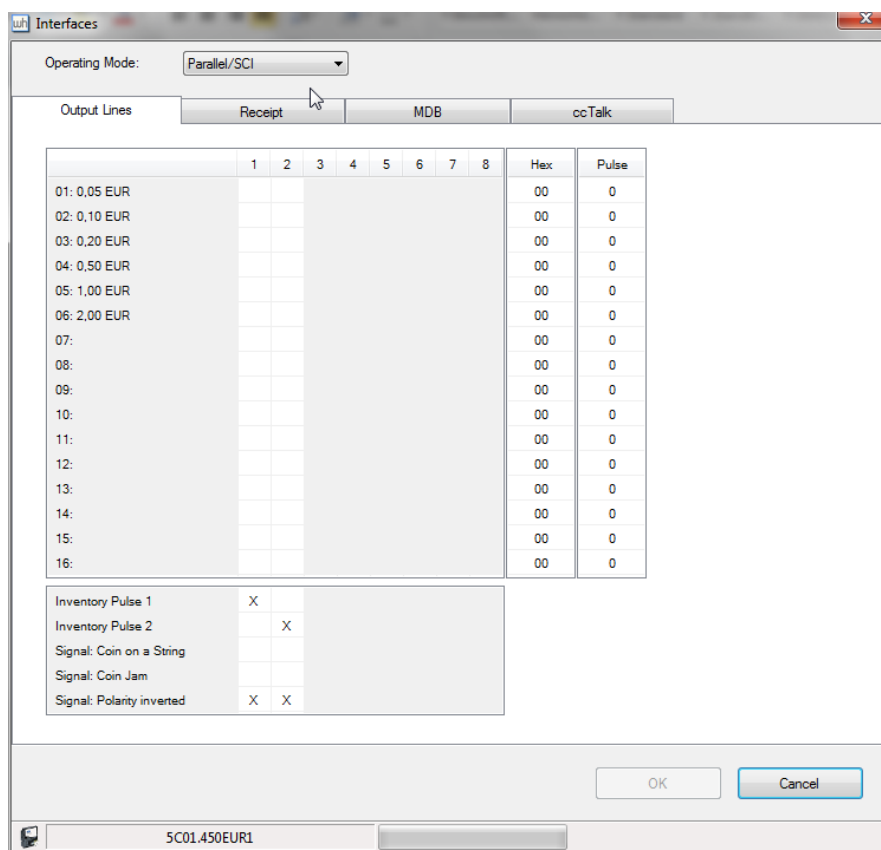


Fig. 7 Register tab "Output Lines"

The figure shows the 16 coin channels (vertically) and the 8 output lines (horizontally). Please note that the EMP 500 v7 uses two output lines only.

The number of coin signals per output channel can be programmed in the column "Pulse".

In the lines "Inventory Pulse 1" and "Inventory Pulse 2" the inventory pulses can be assigned to one of the output lines.

In the lines "Coin on a String" and "Coin Jam" the alarm signals are assigned to one of the output lines. The alarm signals can be distinguished by the controller by a different pulse length.

In the line "Polarity inverted" the active state of the output lines are to be selected (active high or active low). Inverted means, the output transistor is normally conducting and is not conducting to signal a pulse. "Not Inverted" means there is no current through the output during idle times but for signaling coins there is current for the length of the pulse through the output.

2.4.1. Inventory Pulses (Option /I)

The EMP 500 v7 /CLB offers 2 different inventory pulses optionally. These inventory pulses are intended for the counting and logging of accepted coins. The values of the two inventory pulses can be defined under "Configuration" - "Currencies and Coins" (see chapter 2.6. Currencies and Coins). This menu also allows to activate the inventory pulses and to

allocate inventory pulse 1 and inventory pulse 2 to the 16 coin channels. The pulse length and pulse pause are individually programmable in the range of 1 to 255 milliseconds. The factory default is an impulse duty factor of 50 milliseconds /50 milliseconds.



The EMP 500 v7 /CLB can be delivered with two different inventory pulses for both output lines ("Inventory Pulse 1" and "Inventory Pulse 2"). The two inventory pulses can be assigned to the coin channels with the programming software wheasy 5. The advantage is that the number of inventory pulses for the different coin values is reduced and therefore the coin acceptance speed is increased. In contrary to the standard coin pulses with the help of the inventory pulse coins can be accepted even though the release of pulses for the already accepted coin(s) is still in progress.

2.5. Coin Blocking

Coin blocking may be accomplished in various ways. One possibility is the general blocking input line, which will block the coin selector from accepting all coins. Secondly, it is possible to block coins or groups of coins individually through 16 DIP blocking switches on the coin selector. The DIP blocking switches are accessible through a recess in the coin selector cover.

2.5.1. General Blocking (Option /U)

Optionally the EMP 500 v7 /CLB has a potential-free infrared opto-coupler at its disposal for the general blocking. The inhibit voltage depends on the coin selector hardware and lies between 12 and 60 V AC/DC. It is standard that the coin selector is blocked when the infrared opto-coupler is powered up. This is known as "general blocking via low" for the coin selector programming with wheasy 5. Alternatively the general blocking function can be programmed so that the coin selector is blocked when the infrared opto-coupler is not powered.

The signal polarity of the general blocking is programmable with wheasy 5 under the menu selection "Configuration" - "Blocking" and check box "General Blocking by means of '0'" (See figure 8).

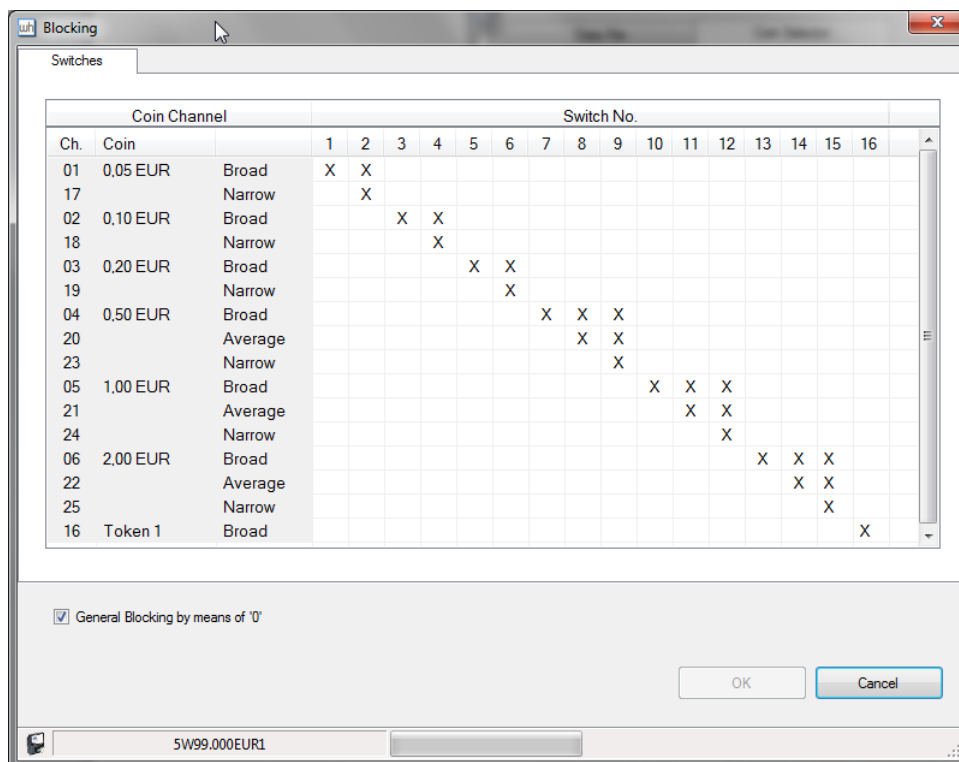


Fig. 8 Allocation of blocking dip switches and function of general blocking with wheasy 5

2.5.2. Individual Coin Blocking via DIP switches

The coin selector has 16 DIP switches for individual coin blocking. Blocking is not active, that is, the coin will be accepted when the switch is in the "OFF" position. A coin will be rejected when the switch is "ON".

The 16 switches can be freely assigned to the 32 coin channels. Each coin channel can be associated with 16 switches. This configuration makes it possible to block individual coins or, if multiple currencies are programmed, it is possible to block a whole currency with one switch. For example 12 individual coins can be assigned to the first 12 switches. Then switch 13 to 16 can be used to block whole currencies. This optimal use of the switches allows the easy selection of one currency or even multiple currencies at the same time.

The following figure illustrates the assignment of blocking switches and also the numeric identity of each switch.

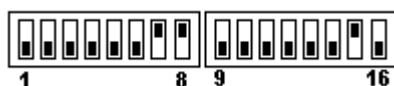


Fig. 9 Blocking assignment

The lower switch position is the "Off" position. The upper switch position denotes "ON". In this example all coins assigned to switch 7, 8 and 15 are blocked

The programming of the blocking switches is done with wheasy 5 and is explained in the wheasy 5 technical manual (see also figure 8).

2.6. Currencies and Coins

Each coin programmed into the coin selector is given a coin value. This value is used for the inventory pulses. For the model EMP 500 v7 /CLB with interface 06 the coin values are used to determine the value paid and for the model EMP 500 v7 /CLB with interface 07 the value is used to determine the purchased time. Coin selectors using the MDB or the ccTalk protocol the currencies and the coin values are required for the status request. During programming with wheasy 5 the coin value is also required for displaying the coins already programmed and the respective channel assignment.

16 different coin values can be programmed into the master channels. The slave channels always have the same coin value as the master channel.

The "Coin Values" selection is available under the "Configuration" – "Currencies and Coins" pull down menu. This window can be used to set and edit the coin values for each channel. Please note that only part of the information in this window is transferred to the coin selector. The remaining information (grey background) is just stored as part of the data on the PC and is used to better describe and understand each channel while working with wheasy 5.

S. Value	Value	Currency	Remark	Tolerance	Inv. 1/2
1	0,05	EUR		Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>
2	0,10	EUR		Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>
3	0,20	EUR		Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>
4	0,50	EUR		Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>
5	1,00	EUR		Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>
6	2,00	EUR		Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>
7	0,00			Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>
8	0,00			Broad	<input checked="" type="checkbox"/> <input type="checkbox"/>

MDB

Scaling Factor: 1

Decimal Point: 2

Value Inventory Pulse 1: 0,01

Value Inventory Pulse 2: 0,50

Create automatically ccTalk Standard IDs

5W99.000EUR1

Fig. 10 Window "Currencies and Coins"

The individual fields are defined as follows:

- S.Value (Calculated Coin value)
The calculated coin value is stored in the coin selector. This value uses the machine controller for the determination of credit (models EMP 500 v7 /CLB with interfaces 06 or 07) and the selector for

calculating the number of inventory pulses. The S.Value is also used for the identification of a coin for the MDB and ccTalk communication.

- Value (Actual coin value)
This "value" is not stored in the coin selector. In certain situations it may be necessary to give a coin an S.value other than its face value. For example, a rebate value may be assigned to a particularly valuable coin. In this case, the "value" is displayed for clarity when working with wheasy 5.
- Currency
The currency information is also stored in the coin selector EMP 500 v7 /CLB. This information is specially of importance when working with multiple currencies in a coin selector and for the ccTalk communication.
- Tolerance
The tolerances are stored in the coin selector. They serve to provide a choice of active tolerance bands with regards to the MDB or ccTalk interface and gives a better overview when working with wheasy 5. The desired tolerances "broad", "narrow", "or very narrow " or "no indication" may be entered here.
- Inv. 1/2
Here a choice is offered between two check boxes, if the corresponding coin inventory pulse 1 or 2 is applied.

There are some special fields at the bottom of the window, below the heading of "Scaling." These adjustable parameters have the following meaning:

- Scaling Factor
This value is used in vending machines that communicate with the coin selector over the serial MDB protocol. This is not significant for the EMP 500 v7 /CLB with parallel interface.
- Decimals
A decimal point location is likewise transferred to the vending machine during a status request as part of the MDB protocol. This does not apply to the EMP 500 v7 /CLB with parallel interface.
- Value Inventory Pulse 1
Here the value for the inventory pulse 1 is defined.
- Value Inventory Pulse 2
Here the value for the inventory pulse 2 is defined.
- Test button
This button is used to let wheasy 5 test whether it is possible to create 8 bit coin values for the MDB status request with the given scaling factor and decimal location. This does not apply to the EMP 500 v7 /CLB with parallel interface.
- Proposal button
wheasy 5 attempts to find a scaling factor and a decimal point position that works for the status request. It is not possible to find such a value if the largest coin value is more than 255 times greater than the

smallest coin value. In this case an error message is shown. This does not apply to the EMP 500 v7 /CLB with parallel interface.

2.7. Slave Channels

The generation v7 coin selectors also have 16 slave channels (channels 17 to 32) available in addition to the so-called 16 master channels. The slave channels can have their own settings for the coin parameters and blocking switches. The slave channels may be assigned arbitrarily to any master channels. It is even possible to assign multiple slave channels (up to 16) to a master channel. The slave channel assignment can be done with wheasy 5 by selecting the "Configuration" pull down - "Currencies and Coins" and "Slave 17 ...24" or "Slave 25 ...32".

The slave channels share the following attributes with the associated master channel:

- Output line. This means that the slave channel will always signal the same output line as the associated master channel.
- Coin Value
- Sorting shaft

2.8. Coin Return

The coin selector EMP 500 v7 /CLB has a feature which will measure and give credit for a coin, and then return it. This feature can be used, for example with test tokens. It can also be used where certain persons, for example employees, are to receive benefits without cost (e.g. car parking).

The setting of this function is also discussed in the wheasy 5 manual in the "Configuration" chapter, under the sub-heading "Coin Routing". The coin return feature is activated by clicking the check box "R".

2.9. Safety Features

2.9.1. Coin on a String (Strimming)

Even if the coin selector is in standby mode, the light barriers are still live. If the light barrier detects a coin in the acceptance channel which has not previously passed the measuring system in the correct way, the coin selector will assume that this coin, for which a receipt has been transmitted, is being pulled back on a thread. Via the parallel interface, the coin selector can give a message for coin-on-a-thread-detection to the machine. The customer can choose any of the coin output lines or a combination of output lines through which the coin-on-a-thread detection is to be signalled. This can be programmed by the factory. The information is emitted by a minimum pulse width of 200 milliseconds. The machine is able to distinguish between coin-on-a-thread detection and a normal receipt signal, as it can recognise the different width and (or) identify a combination of simultaneously arranged coin output lines.

If a coin is still identified in the light barrier after 200 milliseconds have passed, the information will be repeated. During that time, no coin can be accepted.

2.9.2. Coin Jam

If the measuring system identifies a coin, but measuring is concluded via "timeout" instead of the correct measuring procedure (coin leaves coin selector passing the receipt light barrier or the return), this will be interpreted as "coin jamming".

Via the parallel interface, the coin selector can give a signal for coin jamming to the machine. The customer can choose any of the coin output lines or a combination of output lines through which coin jamming will be signalled. This can be programmed by the factory. The information is emitted by a minimum pulse width of 200 milliseconds. The machine is able to distinguish between coin jamming and a normal receipt signal, as it can recognise the different width and (or) identify a combination of simultaneously arranged coin output lines.

The following coin jam signals are possible:

- Coin jam 1 (in the measurement system)
- Coin jam 2 (not used on EMP 500 v7 /CLB)
- Coin jam 3 (between the measurement system and the acceptance light barrier)
- Coin jam 4 (in the acceptance light barrier)
- Coin jam 5 (not possible with the EMP 500 v7 /CLB)
- Coin jam 6 (not used on EMP 500 v7 /CLB)

If a coin is still identified in the light barrier after 200 milliseconds have passed, the message will be repeated. During this time the coin acceptance is blocked.

2.10. RFID Card Reader Functionality EMP 500 v7 /CLB

The EMP 500 v7 /CLB does have a RFID card reader integrated into the side wall of the coin slot. It can be used to pay with a preformatted RFID tag. Please ask your provider of the coin selectors for more information.

General there are two modes of operation:

- a) The serial interface between the coin selector and the machine controller transfers the price to charge to the EMP 500v7 /CLB and the price is deducted from the CLB Pay Key upon insertion into the coin slot. The machine gets told the successful payment via serial interface.
- b) The price of the service is set with the help of a CLB Price Key. Upon insertion of a CLB Pay Key the set price is deducted from and the machine is started by emitting the paid value as inventory pulses.

2.10.1. Install whcashless App

Please install the whcashless App from the Android app store "Play Store". You can use this QR code to install the app from the Play Store for Android:

<https://play.google.com/store/apps/details?id=com.ionicframework.whbalancingapp936250&hl=de>



Or the App store of Apple:

<https://apps.apple.com/us/app/cashless-laundry/id1385395416>



2.10.2. Creation of an Operator Account

To enable the cash flow through PayPal to your PayPal Account you need to own a PayPal Business Account. Please have the information of your PayPal Business account available when creating the operators account:

Client ID (an example – not working):

AYBeaaAoGa8ZzNfj7Kp36L8HYIeu-
BKgcu7Z2CzYcUi7tSwbgN1VQIZ5X0fGyT9mwtP5HiNTN-1MP1E5

Secret (an example – not working):

EK7Le2_rdLeQCqUjDVyARHDIRqrCbMLJ6pWhcOZNMkr8PuwkbtOhT5itTL
_49Ofudh3Bj7ZFbysG3Sn9

You receive this data from inside your PayPal business account:

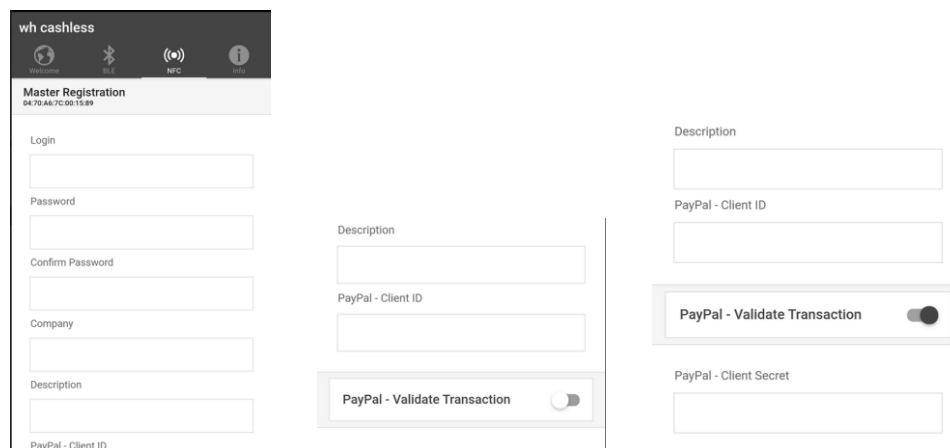
Select in the menu: Tools -> All Tools, then click on "developer" (|</>|)
Inside the developer Menu-Bar select "Dashboard" hidden under your account name on the far right side

Scroll down to "REST API apps" and create an app and name it "whpay" or similar. When created you select "live" (Sandbox Live) and find the "Client ID" and the secret will be shown by clicking "show" under "secret".

Please make sure you selected "Live" (Sandbox Live), otherwise you will not receive payments!

Creating your operators account you need to have a CLB Operator Key. If you do not have a CLB Operator Key, please contact your provider to get you one.

Please scan your CLB Operator Key while the app whcashless is open. The correct tab is opened and enables you to insert your data. Please make sure you remember your password and please double-check the email address you typed in.



The fields have the following rules (If the rules are satisfied you will see a little green checkmark beside the field of the entry.):

Login: at least 8 characters, no spaces or punctuation allowed

Password and Confirm password

Company: 2 ... 32 characters

Description: 2 ... 64 characters

PayPal ID: The ID with 80 characters

PayPal validate transaction: Here you decide whether you like the server to validate the transaction made by the user to have taken place before adding the value to the users account. If so, you need to insert the PayPal – Client Secret into the next field.

PayPal – Client Secret: The secret retrieved from PayPal

If all mandatory fields have entries and the requirements to the entries (as described above) are satisfied, the "Register" button becomes available. Please hit "Register" to create your account.

2.10.3. Setting the Identity of a Coin Selector

To set the identity of a coin selector a CLB Operator Key needs to be used. The CLB Operator Key needs to be initialized with the operators account as described above.

This identity makes sure the funds charged to the CLB Pay Key are routed to you as the owner of the coin selector.

There are multiple possibilities to prepare the coin selector to accept a CLB Operator Key:

- a) Move all DIP switches of the coin selector to the ON position, the last one to be number 8 – insert the CLB Operator Key – hear one activation of the solenoid – switch off all DIP switches the first one to be number 8.
- b) If your coin selector is attached to the serial interface of your machine – bring your machine in "service mode" or in "price setting mode" – insert the CLB Operator Key – hear one activation of the solenoid – make the machine return to normal operation mode.
- c) Attach the coin selector to wheasy 5 - insert the CLB Operator Key – hear one activation of the solenoid – detach from wheasy 5.

Please set the machine name in your app connected via Bluetooth according to the ID of the machine printed visible on the machine. The user will have a list of machines in their BLE tab of their whcashless App. They need to identify the machine they want to use using this identifier.

2.10.4. Getting multiple Operator Keys

There are two options:

- a) The CLB Operator Key can be purchased from the same source as you purchased the EMP 500 v7 /CLB.
- b) When logging in to your account on <https://cashless.whberlin.de/home#/> there is the option to order additional keys under "CLB Operator Keys".

2.10.5. Setting the Price(s) of a Coin Selector

The prices are in use only in the case of the pulse interface of the coin selector is used and therefore the coin selector does not get the actual prices of the washing / drying cycle told from the washer/dryer.

The coin selector has an adjustable price setting.

To set / change the price setting the CLB Operator Key is to be placed into the coin selector to enter the operator mode which allows the setting of the price. Now the app needs to connect to the coin selector mode within 30 seconds after the placement of the CLB Operator Key. The dialog allows the setting of the price deducted from the CLB Pay Key with each insertion.

2.10.6. Setting the Price with a Price Setting Key

To initialize or change a CLB Price Key the CLB Operator Key is to be placed into a coin selector which represents the wanted price settings. How to adjust the price setting of this coin selector is described in 2.10.5 "Setting the Price(s) of a Coin Selector". The coin selector will click once as a receipt for being in operator mode.

This mode does have a timeout of 30 seconds. If a CLB Price Key is inserted during this time, the price setting of this specific coin selector is copied onto the CLB Price Key.

Now this CLB Price Key can be used to set the prices contained on the key to every coin selector of this operator by just inserting it and waiting for the click of the solenoid as a receipt.

2.10.7. Personalize a CLB Pay Key

To personalize CLB Pay Key to the operator, please follow this process:

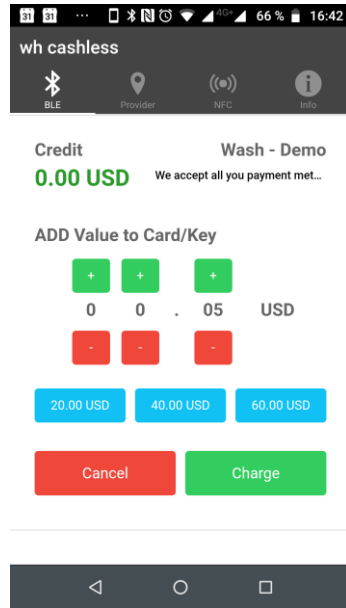
1. Insert an unused CLB Pay Key into the coin slot of an initialized coin selector
2. Hear the solenoid of the coin selector click once as the receipt of successful initialization

Now the CLB Pay Key is ready to be used. Funds need to be loaded onto the CLB Pay Key, which is described in the next chapter.

2.10.8. Loading CLB Pay Key with funds via PayPal

To load the CLB Pay Key with usable funds please use the following process:

1. Please scan your CLB Pay Key with your cell phone (precondition the payment app is installed as described in the chapter "Install whcashless App"). The payment App is started automatically. Please rescan the card, the correct tab is opened.



2. Use "+" and "-" buttons to adjust the amount to put on the CLB Pay Key or tap on the pre-set buttons to select an amount.
3. Tap on "Charge" to get forwarded to the PayPal Screen where you can choose between the payment with Credit card or the payment with your PayPal funds. Afterwards please follow through the PayPal process
4. Rescan the CLB Pay Key with your cell phone to write the new value onto your CLB Pay Key.
5. The new value on your card is shown in the App.

2.10.9. Use the CLB Pay Key

The amount to deduct from the card is either transmitted to the coin selector via serial interface or pre-set to the coin selector with a price setting card.

Only CLB Pay Key with personalisation matching the personalisation of the coin selector are accepted.

Upon insertion of the CLB Pay Key into the coin slot of the coin selector the price is deducted from the CLB Pay Key in the coin slot. Then the according pulses are emitted or the price deducted from the CLB Pay Key is transmitted to the machine.

2.11. Bluetooth Functionality

The Bluetooth functionality uses the Bluetooth Low Energy communication standard implemented in cell phones using Android 5.0 or higher or iPhone 5 or higher.

All Bluetooth functionality require to have the whcashless App to be installed on the cell phone.

2.11.1. Charging the Cell Phone with Funds

The cell phone can be used as if it was a CLB Pay Key described above. There are two major differences:

- It handles multiple accounts of operators on the same device.
- The connection between the cell phone and the coin selector is a Bluetooth connection.

Opening the whcashless App and selecting the BLE tab the app scans the environment. Being in the reach of a machine offering payment via Bluetooth the machine identifier (shown on the machine) is shown in a list on the BLE tab.

The company names of the operators are given and the tapping on "charge" enters the same payment dialog described under "Loading CLB Pay Key with funds via PayPal".

2.11.2. Use the Bluetooth Functionality of the Cell Phone for Payments

Open the wh cashless App on your cell phone. If there are coin selectors in reach for accepting a Bluetooth connection, the Bluetooth Tab is selected automatically.

Select the machine you want to use on the list of available machines on the BLE tab of your app with tapping on the machine number.

For machines using serial connection between controller and coin selector:

Use the machine to select a service. Check the price shown on the cell phone and tap on "pay".

For machines using parallel connection between controller and coin selector (pulse interface):

Check the price of the service you selected on the display of the machine and type the price with the provided number keypad and tap on "Pay".

The funds are deducted from your cell phone account and the machine starts the service.

3. The EMP 500 v7 /CLB with Interface 06 – 1 Price Totalizer

3.1. General

The EMP 500 v7 /CLB with interface 06 is an electronic coin selector with an incorporated totalizer for 1 vending price. The price is set via an eightfold DIP-switch (binary-coded 0 to 255) or via the programming software as a multiplier of a programmed internal transfer value (usually smallest coin value)

The EMP 500 v7 /CLB with interface 06 has different deletion functions (e.g. self-deletion) for the price line, which will be explained in detail in the manual.

For tokens the coin selector can be programmed as such that the credit always equals the set price.

3.2. Price Setting

The programming of the price is carried out via the programming software wheasy 5 or is set via the DIP-switches 9 to 16. The required settings are found under "Configuration" – "Stepper/Timer" and "Common". If checkbox "2nd switch is price switch" is activated DIP switches 9 to 16 can be used to set the price.

3.2.1. Price Setting via wheasy 5

The setting of the price by means of wheasy 5 is done on the tab: "Price" in the menu: "Configuration" – "Stepper/Timer". The following shows an example with a vend price setting of 5.00 EUR.

Price and Bonus

Value	<input type="text" value="5.00"/>	Bonus Counter	<input type="text" value="4"/>
Calculation Value:	<input type="text" value="5.00"/>		

Fig. 11 Setting the vend price for the EMP 500 v7 /CLB interface 06

The setting of the number of vends for the bonus system is carried out on this tab. For more details of the bonus system refer to chapter 3.3.

3.2.2. Price Setting via DIP Switches

If checkbox "2nd switch is price switch" on the tab "Common" in the menu "Configuration" – "Stepper/Timer" is activated, the price setting must be accomplished via the DIP switches 9 to 16. In this case these DIP switches are no longer available for individual coin blocking. The setting of the "calculation value" for the DIP switches is done on the tab "Price" in the menu "Configuration" – "Stepper/Timer". Figure 12 shows an example with a value set to 0.50 (e.g. 0.50 €).

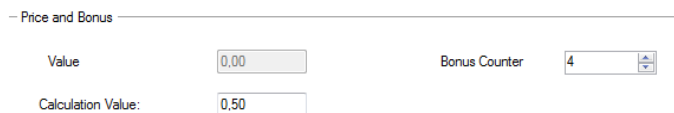


Fig. 12 Programming of the multiplier to set the vend price via DIP switches

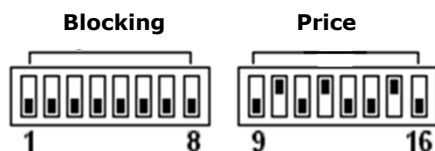


Fig. 13 Assignment of the DIP switches when the price setting is programmed to be carried out via DIP switches

By means of the DIP switches the price is set binary as a multiplier (0 ... 255) to the programmed calculation value. By default, the "calculation value" is set to equal the smallest programmed coin value. However, it may also be programmed with a different value.

The following example illustrates how a price of 37.00 € is set via the DIP switches. The calculation value in this case is programmed with 0.50 € (see also figure 13).

switch no.	binary value	value	position	price
9	1	0.50 €	OFF	0.00 €
10	2	1.00 €	ON	1.00 €
11	4	2.00 €	OFF	0.00 €
12	8	4.00 €	ON	4.00 €
13	16	8.00 €	OFF	0.00 €
14	32	16.00 €	OFF	0.00 €
15	64	32.00 €	ON	32.00 €
16	128	64.00 €	OFF	0.00 €
sum:				<u>37.00 €</u>

3.3. The Bonus Function

With the bonus function of the EMP 500 v7 /CLB with interface 06 the number of vends needed for a free vend can be set. Only credits which are achieved before the first cashing are considered. Therefore a bonus function with automatic deletion of prices should not be used as this would require to achieve the required amount for the number of vends by inserting a single coin only. With the EMP 500.xx.6 v7 coins are cashed with the main blocking line.

If the number of vends required for bonus function is set to "0" no bonus is given.

3.3.1. Setting the Bonus with wheasy 5

Programming of the bonus function with wheasy 5 is carried out under "Configuration" - "Stepper/Timer" on tab "Prices". Figure 11 and figure 12 show a setting where a free vend is given after four vends in a row. After inserting 10 x 2.00 € the credit achieved is not 20.00 € = 4 vends, but 25.00- = 5 vends.

3.4. Token Management

If the coin selector has been calibrated with tokens, it is possible to trigger a vending process independently of the programmed price via the price line by programming the respective coin channels for the associated token.

The programming of the function is carried out with wheasy 5 under "Configuration" - "Stepper/Timer" and register tab "Coins".

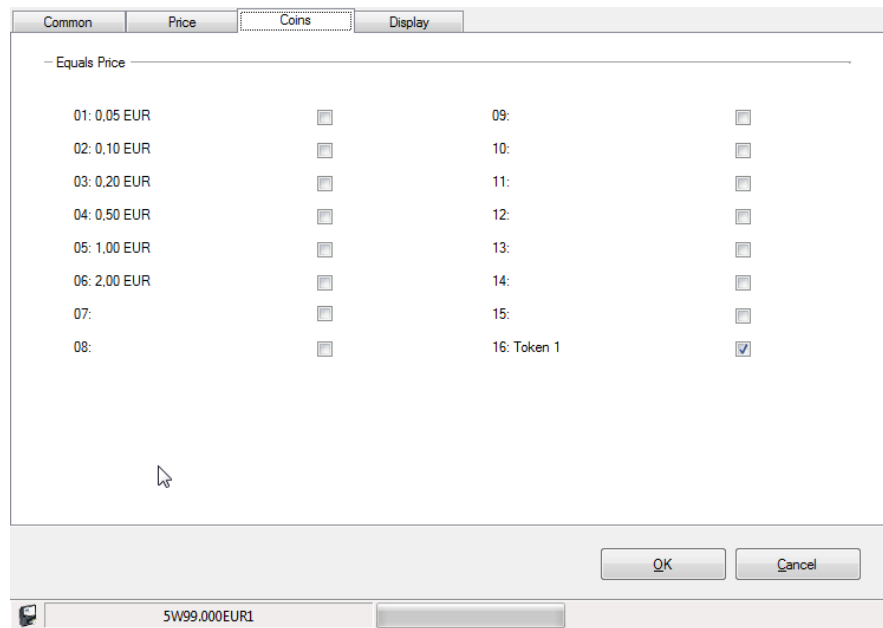


Fig. 14 Register tab "Coins" / "Stepper/Timer"

Figure 14 shows the register tab "Coins", in which the following adjustment example has been chosen. The token programmed in channel 16 triggers immediately the price.

3.5. Allocation of the Price Signal to the Coin Selector Output Lines

The allocation of the price signal to a coin selector output line takes place under "Configuration" - "Stepper/Timer" on the tab "Price". For the EMP 500 v7 /CLB with interface 06 the price signal can be allocated to output line 1 or 2. Fig. 15 shows the standard configuration where the price signal is assigned to output line 1.

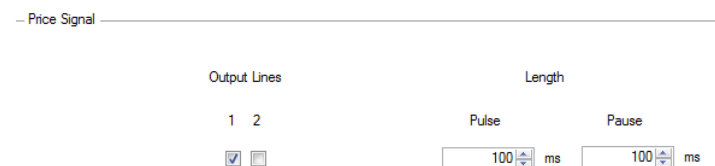


Fig. 15 Detail "Stepper/Timer" tab "Price"

For multiple vending the pulse and pause time is important and defines the period after the price line may be set again if the credit is still sufficient for another vend.

3.6. Vending Mode

3.6.1. Multiple Vending

“Multiple Vending” means that the pre-set price can be “overpaid” repeated times. After deleting the price, the price line is set again, if the credit is still sufficient for another vend. Between the deletion of the price line and the new setting of the price line a programmed time passes by, which is adjustable between 1 milliseconds and 65 seconds.

The function “Multiple Vending” is activated under “Configuration” – “Stepper/Timer” on the tab “Common” (see Fig. 16). The pause time between the price pulses is set under “Configuration” – “Stepper/Timer” on the tab “Prices” under “Pause” (see Fig. 15, the example shows a pause time of 100 ms).

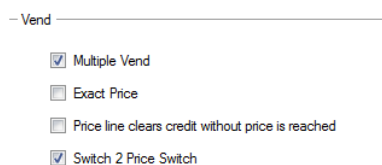


Fig. 16 Vend Functions

3.6.2. Pay Exact Amount

The function “pay exact amount” ensures that the coin selector accepts only coins until the credit equals exactly the pre-set price. By using this function an overpayment is not possible.

The setting of this function is carried out with wheasy 5 under “Configuration” – “Stepper/Timer” and register tab “Common” (see Fig. 16).

3.7. Cancellation and Encashment

The price-line of the EMP 500 v7 /CLB with interface 06 will be activated when the credit, accumulated by coin insertion, equals or exceeds the pre-set price. It will be deactivated when the vending machine controller sends the cancellation signal after the vend has been accomplished. For the adaption to the various machine requirements, the EMP 500 v7 /CLB with interface 06 offers different possibilities for the cancellation.

The configuration of the “Cancellation and Encashment” function is by means of wheasy 5 effected on the tab “Common” in the menu “Configuration” – “Stepper/Timer”. Figure 17 shows a detail of the respective window.



Fig. 17 Cancellation and encashment function

3.7.1. External Cancellation

3.7.1.1. In General

External cancellation specifies that the reset is accomplished by the receipt of a signal from the machine controller. This can be effected on the EMP 500 v7 /CLB with interface 06 via the input line "General Blocking". Figure 17 shows the setup with the cancellation programmed to be effected via the main blocking line.

The coin selector will not accept coins as long as an external cancellation signal is applied. The resetting of the price line is effected earliest after 1 millisecond after receipt of the cancellation signal and it can be delayed up to 65 seconds (pulse duration). The setting of the delay time is accomplished in the menu "Configuration" – "Stepper/Timer" on the tab "Price" in the field "Length" - "Pulse". Figure 15 shows a setting of pulse duration of 100 milliseconds.

3.7.1.2. Configurations of the Cancel Function

Clear line holds price line

Sometimes the machine control demands that the price line remains active as long as the cancel signal is applied. The price line is reset and the credit is erased when the cancel signal gets inactive. In this case the checkbox „Clear line holds price line" must be activated (see Figure 17).

No price line on active clear

In the mode "Multiple Vend", the price line will be set again after cancellation when the remaining credit is still equal or higher than the set vend price. The second activation of the price line can be programmed to be delayed between 1 millisecond and 65 seconds. The setting is accomplished in the menu "Configuration" – "Stepper / Timer" on the tab "Price" in the field "Pause", see Figure 15.

With some machine controller it is essential that the price line is not set as long as the cancel signal is active. In this case, the function "No price line on active clear" must be enabled (see Figure 17).



The functions "Clear line holds price line" and "No price line on active clear" are mutually exclusive. If one function is activated wheasy 5 disables the other one automatically.

Timed credit clear

The function "Timed credit clear" specifies that a credit lower than the pre-set price will be erased automatically after a programmed time. The time after which the remaining credit should be erased is set in the same window as this function is activated by means of the respective checkbox (see Figure 17).

Always delete credit

This feature expands the function "Timed credit clear" in the way that a credit that is higher or equals the set price is also erased after the time out. It is essential that the function "Timed credit clear" is enabled when "Always clear credit" is activated.

3.7.2. Automatic Erasure

This function features that the coin selector will automatically send a pulse via the price line and deduct the credit each time the build-up credit equals or exceeds the set price. This mode requires no signal from the machine.

The setting of the duration is effected in the menu "Configuration" – "Stepper/Timer" on the tab "Price" in the field "Pulse". Figure 15 shows a setting of the pulse length of 100 milliseconds.

The price line will be automatically activated again if the coin selector is set for "multiple vend" and the remaining credit is higher or equals the set price. The reactivation of the price line can be delayed by a programmable time between 1 milliseconds and 65 seconds. The setting is accomplished in the menu "Configuration" – "Stepper/Timer" on the tab "Price" in the field "Pause". Figure 14 shows a setting of the delay time of 100 milliseconds.

3.8. Display

For the EMP 500 v7 /CLB with interface 06 the 4-digit LED display D 500 is suitable. The display is connected to the programming connector (see chapter 2.2 Programming Connector) of the coin selector. It can show the price, the remaining value or the accumulated credit.

The configuration of the display functions is accomplished in the menu "Configuration" – "Stepper/Timer..." on the tab "Display" (see Fig 18).

3.8.1. Hide Leading Zeros

This feature is to be activated, if left-hand zeros shall not be displayed. If this feature is activated, e.g. 1.00 is displayed, whereas when this feature is not activated 01.00 is displayed.

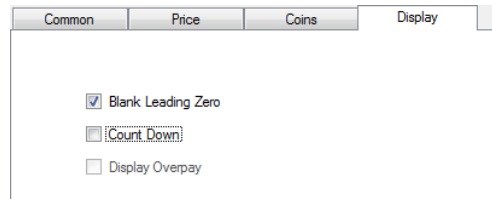


Fig. 18 Tab „Display“ for totalizer function

3.8.2. Count Down

In this mode the display D 500 will show the set price as long as no credit is available. It will change to show the value: "set price - credit" when a coin was inserted.

Example: Price 1 is set to 1.50 €. After the insertion of 1 x 1.00 € and 1 x 0.50 €, the following is shown in the display:

insertion	credit	display	remarks
	0.00	01.50	display of price
0.50 €	0.50	01.00	
1.00 €	1.50	00.00	price line 1 active
			selection of goods price 1
			cancellation & encashment
	0.00	01.50	display of price

Should an amount be inserted which is higher than the set price, the display indicates 00.00 until the vend is finished.

3.8.3. Display Overpayment

The feature "Display Overpayment" only works in combination with the function "Count down".

In this mode the display D 500 shows also the pre-set price, as far as no credit is available. If the customer however pays more than the set price, the display will then show the overpaid value.



This mode is advisable when the coin selector is set to "multiple vend" and the price should be displayed.

Example: price 1 is set to 1.50 €. After the insertion of 2 x 1.00 € the following is shown in the display:

insertion	credit	display	remarks
	0.00	01.50	display of price
1.00 €	1.00	00.50	display of remaining amount
1.00 €	2.00	00.50	price line 1 active, display of overpayment
			selection of goods price 1
			cancellation & encashment
	0.50	01.00	display of price minus overpayment

When an amount is inserted which is higher than the set price, the display indicates the overpayment until the vend is completed. On completion, the outstanding amount needed for the following vend is displayed.

4. Serial Interface

The EMP 500 v7 /CLB serial interface communicates over one of three different protocols with the machine controller. The first serial protocol is the SCI (serial communication interface), in which the coin selector sends out a 5-byte data frame to the machine controller after each event. The other serial protocol is the MDB protocol (Multi Drop Bus). The third serial protocol is ccTalk, which has its own connector on the coin selector.

All three interfaces operate at 9600 baud rate.

4.1. Serial Connector

A description of the serial connector can be found in chapter 2.2 Programming Connector. All three protocols use the same hardware. Therefore the interface does not meet the hardware specification of the MDB and the ccTalk interface!

4.2. SCI Interface (display interface)

The EMP 500 v7 /CLB communicates through a serial interface with the following specifications:

data format: 9600 Baud, 1 start bit, 1 stop bit, no parity, 8 data bits, separate send and receive lines.

high level	+ 5 volts	logical 0
low level	0 volts	logical 1

The SCI interface of the coin selector can be programmed to operate in one of two modes:

1. The programmed coin value of the last accepted coin is sent repeatedly at a rate of 5 Hz.
2. The programmed coin value is only sent once after the coin is accepted.

The SCI mode can be configured with the programming software wheasy 5. Select the "Configuration" pull down menu. Select "Interfaces" and then the "Receipt" tab. The checkbox "SCI only once" sets the mode so that the data set is only set once.

The EMP 500 v7 sends a 5-byte data frame with each message. The first 4 bytes each are one digit of the value of the accepted coin. The fifth byte contains information such as the channel number (with accepted coins), whether the coin return was pressed, if the channel was blocked, error messages, etc.

The data bytes have the following format:

1. Start bit
2. LSB
- ...
9. MSB
10. Stop bit

The least significant byte (LSD) of the data bytes is sent first. All other bytes follow relative to their ascending value. The details of the value of the corresponding decimal place is included (hexadecimal) in the lower nibble of the bytes. The upper nibble shows again the place.

Value of the data bytes

(X: value between 0 and 9)

Ascending Value

FXh

MSD (Most Significant Digit)

EXh

DXh

CXh

LSD (Least Significant Digit)

The EMP 500 v7 is always a master device when it is in SCI Mode. The SCI interface transfers 5 bytes with a refresh frequency of 5 Hz or after each result.

Definition of the 5th byte:

value of the 5th.byte (HEX)	Meaning		
	standard	32 channel messages	SCI v3 compatible
70H ... 7FH	/	coin channel 17 ... 32 recognized	/
80H ... 8FH	coin channel 1 ... 16 recognized		
90H	coin return button pressed		
91H	reject – coin following to closely		
92H	coin jam 1		/
93H	reject – no matching parameter set		
94H	/		reject - coin channel blocked
95H	coin jam 2		/
96H	reject – DIP switch blocking		/
97H	coin jam 3		coin jam
98H	coin jam 4		/
99H	coin jam 6		/
9AH	reject – rim detection		
9BH	reject – lead detection		
9DH	coin on a thread		
9EH	reject – general blocking		
9FH	reject – coin selector busy		

Example:

programmed value of the accepted coin	transferred data, binary	data, hexadecimal
channel 1 20.00	1100 0000 1101 0000 1110 0000 1111 0010 1000 0001	C0 D0 E0 F2 80
channel 2 05.00	1100 0000 1101 0000 1110 0101 1111 0000 1000 0010	C0 D0 E5 F0 81
channel 3 00.50	1100 0000 1101 0101 1110 0000 1111 0000 1000 0011	C0 D5 E0 F0 82
channel 4 00.25	1100 0101 1101 0010 1110 0000 1111 0000 1000 0100	C5 D2 E0 F0 83
chan. 17 00.05	1100 0101 1101 0000 1110 0000 1111 0000 0111 0001	C5 D0 E0 F0 70

Fig. 19 Data format for acceptance of coins with different coin values and different channels

4.3. Multi Drop Bus (MDB)

The coin selector can be set up to communicate with the machine controller using the MDB protocol. wheasy 5 can be used to program this setting. Select "Configuration" – "Interfaces". Set the operating mode to MDB/ccTalk.



The EMP 500 v7 /CLB has an implementation of the MDB protocol according to I.C.P. (MDB European Version). The still free available address 0Fh (15Dez) was chosen in order to avoid conflicts with other MDB devices. The command set and the bus timing correspond to I.C.P. standard. Additionally a MDB adapter (MDB 100) is available if the hardware specification of the interface is also requested.



After each "Reset" the coin selector will be set automatically to either MDB or ccTalk communication depending on the first command received from the host. The first command may only be sent after the "start up period" of 20 milliseconds.

4.3.1. Protocol Specifications

Data format:

- 1 Start Bit
- 8 Data Bits
- 1 Mode Bit
- 1 Stop Bit

Mode Bit: VMC to EMP

The mode bit distinguishes ADDRESS bytes and DATA bytes. ADDRESS bytes are read by all peripheral devices and DATA bytes are only read by active peripheral devices. An active peripheral device is defined as a device that has successfully established a contact with the master (VMC).

The mode bit is set (logically 1) in order to mark an ADDRESS byte. When the mode bit is not set (logically 0) it marks a data byte.

Mode Bit: EMP to VMC

The mode bit is set with the last byte when the slave (EMP) is transmitting data to the master (VMC). Consequently, the slave (EMP) always sets the mode bit together with the check sum or with ACK.

Check sum

The last byte of every data transfer from the VMC to the EMP is always the check sum.

4.3.2. Conventions

Using the Multi drop Bus all commands and answers must be answered within a given period or acknowledged respectively!

The coin selector answers every command and every polling within 5 milliseconds. If the coin selector is busy and therefore cannot answer within the 5 milliseconds the selector no longer retains the command. The VMC (Vending Machine Controller) must handle this as a NACK (FFh). All

answers from the coin selector to a poll command must be acknowledged through the VMC within 5 milliseconds with ACK (00h). Older specifications of the MDB protocol defined 5 ms, nowadays it is 20 ms. With the EMP 500 v7 /CLB this timing can be programmed. As a standard for the EMP 500 v7 /CLB 8 ms are set. If no acknowledgement has been received within 8 milliseconds the coin selector handles this as a NACK and transmits the same answer on the next poll command again.

4.3.3. Basic Commands

Command	Code	Data
RESET	78h	-

The acceptance of coins is blocked. The response to the next poll is 07h (Reset).

Command	Code	Data from the EMP
STATUS	79h	30 byte Z1 to Z30

Z1	[reserved]
Z2 - Z3	country code
Z4	scaling factor
Z5	decimal place
Z6	number of sorting shafts (upper nibble)
Z7 - Z14	shaft of main cash box (lower nibble)
Z7 - Z14	channel – shaft assignment
	in one nibble the number of a coin channel beginning with the shaft number of type 0; in the upper nibble beginning with Z7
Z15 - Z30	values of coins, beginning with type 0 in Z15

Command	Code	Modifier	Data from EMP
Master – Slave assignment	7Fh	23h	8 Bytes Z1 to Z8
Z1 – Z8	Master – Slave assignment, coded in one nibble. Beginning with the master for channel 17 (slave 1) in the upper nibble of Z1 to the master for channel 32 (slave 16) in the bottom nibble of Z8.		

Command	Code	Data from EMP
POLL	7Bh	1 byte

When a response is given it is important whether the coin selector is operating in ordinary or in extended MDB protocol.

- ordinary multi drop bus protocol

00h	no result (ACK)
07h	reset
8nh	type n ¹⁾
90h	coin return button pressed
91h	subsequent coin in measuring system
92h	coin jam 1
93h	coin does not match parameter set
94h	multi drop blocking
95h	coin jam 2

96h	coin blocking
97h	coin jam 3
98h	coin jam 4
99h	coin jam 5
9Ah	rim detection error
9Bh	lead detection
9Ch	coin following to closely in TCAP1
9Dh	coin-on-a-thread detection
9Eh	sorting error
9Fh	coin selector busy

1)

If the interface has been set to "Report 32 channel" (factory setting) the channels 1 to 16 are reported with 80h to 8Fh and channels 17 to 32 are reported with 70h to 7Fh. This is a special WH Münzprüfer function, as the MDB specifications only define for a maximum of 16 coin channels.

- Extended Multi Drop Bus Protocol

00h		No result (ACK)	
07h		Reset	
8nh	0nh	type n ¹⁾	shaft m
90h	8nh	coin return button pressed	type n ¹⁾
91h	8nh	subsequent coin in measuring system	type n ¹⁾
92h		coin jam 1	
93h		coin does not match parameter set	
94h	8nh	multi drop blocking	type n ¹⁾
95h	8nh	coin jam 2	type n ¹⁾
96h	8nh	coin blocking	type n ¹⁾
97h	8nh	coin jam 3	type n ¹⁾
98h	8nh	coin jam 4	type n ¹⁾
99h	8nh	coin jam 5	type n ¹⁾
9Ah		rim detection error	
9Bh		lead detection	
9Ch	8nh	coin following to closely in TCAP1	type n ¹⁾
9Dh	8nh	coin-on-a-thread detection	type n ¹⁾
9Eh	8nh	sorting error	type n ¹⁾
9Fh		coin selector busy	

1)

If the interface has been set to "Report 32 channel" (factory setting) the channels 1 to 16 are reported with 80h to 8Fh and channels 17 to 32 are reported with 70h to 7Fh. This is a special WH Münzprüfer function, as the MDB specifications only define for a maximum of 16 coin channels.

Command	Code	Data to the Coin Selector
Coin Type	7Ch	4 Bytes Y1 to Y4
Y1 - Y2		coin release for each type 1 bit, 1 = release Note: the least significant bit is assigned to type 1!
Y3 - Y4		coin in main cash box for each type 1 bit, 1 = to main cash Note: the least significant bit is assigned to type 1!

The coin type command is equally valid for the master and all assigned slave units.

Command	Code	Modifier	Data to the Coin Selector
Extended Coin Type	7Fh	20h	6 Bytes Y1 to Y6

Y1 - Y4 coin release
for each type 1 bit, 1 = release
Note: the least significant bit is assigned to type 1.

Y5 - Y6 coin in main cash box
for each type 1 bit, 1 = to main cash
Note: the least significant bit is assigned to type 1.

The extended coin type command allows for the individual blocking or unblocking of each of the 32 coin channels. The main coin box rerouting applies to all master and associated slave channels equally.

Command	Code	Data to the Coin Selector
Channel assignment	7Eh	9 Bytes Y1 to Y9

Y1 Number of the main coin box
Y2 - Y9 Assignment of the channel/shaft, one nibble each
Y2 Y3 Channel 1/2 2/3



The given default coin sorting sequence is reverted to after a reset.

Command	Code	Modifier	Data from EMP
Identify	7Fh	00h	33 Bytes Z1 to Z33

Z0 - Z3 WHM
Z4 - Z15 number of machine
Z16- Z27 number of model / bar code
Z28- Z29 software version packed BCD-code
Z30- Z33 future options

Command	Code	Modifier	Data from EMP
Request	7Fh	01h	13 Bytes Z1 to Z13

Z1 - Z2 Coin Release, 1 Bit per type, 1 = Unblock coin
Z3 - Z4 Coin routed to cash box, 1 Bit per type, 1 = cash box
Z5 Cash box sorting shaft
Z6 - Z13 Sorting shaft number of each type of coin; one nibble per type, beginning with type 1 in the upper nibble Z6

This request is used to establish the actual blocking and sorting of the 16 master channels.

Command	Code	Modifier	Data from EMP
Extended Request	7Fh	21h	15 Bytes Z1 to Z15

Z1 - Z4 Coin Release, 1 Bit per type, 1 = Unblock coin
Z5 - Z6 Coin routed to cash box, 1 Bit per type, 1 = cash box
Z7 Cash box sorting shaft
Z8 - Z15 Sorting shaft number of each type of coin; one nibble per type, beginning with type 1 in the upper nibble Z8

The extended request is used to establish the actual coin release and sorting of all 32 channels. The sorting of the master and slave channels are always the same.

Command	Code	Modifier	Data from EMP
Coin Precision	7Fh	FFh	13 Bytes Y1 to Y13

Y1 – Y4	ASCII-Code for BDTA
Y5	Command Code 00H
Y6 – Y13	Value for the desired acceptance band width for coin type 0 – 15 coded in half bytes.
00H:	wide
01H:	medium
02H:	narrow
03H:	very narrow
0AH:	tests factory-wise
0EH:	give back max. possible default setting
0FH:	no modification of current adjustments
Data for VMC:	
Z1 – Z8	current value for the acceptance band width coded for coin types 0 – 15 in half bytes

4.4. ccTalk Interface



The EMP 500 v7 /CLB uses a ccTalk standard protocol (www.cctalk.org Version 4.2). The hardware interface does not satisfy the standard. The voltage levels and currents have to be checked against the limits and the other side has to be implemented accordingly.

Coin selector selectors to be used with the ccTalk interface have to be set to MDB. The coin selector recognises automatically the active protocol of the connected controller.



After each "Reset" the coin selector will be set automatically to either MDB or ccTalk communication depending on the first command received from the host. The first command may only be sent after the "start-up period" of 20 milliseconds.

4.4.1. Command Overview

Header	Function	Answer, data and remarks
254	Simple poll	Answer with ACK
253	Address poll	MDCES support acc. to specification
252	Address clash	MDCES support acc. to specification
251	Address change	MDCES support acc. to specification
250	Address random	MDCES support acc. to specification
249	Request polling priority	[002][020] = 10ms × 20 = 200ms
248	Request status	[000] = OK [001] = reject activated [002] = coin-on-a-string manipulation
247	Request variable set	2 Byte customer identification (wh specific)
246	Request manufacturer id	,WHM'
245	Request equipment category id	,Coin Acceptor'
244	Request product code	,EMP'
243	Request database version	[000] = no remote programming via ccTalk
242	Request serial number	[032][003][000]
241	Request software revision	,EMP-V4.29b' or later version
240	Test solenoids	Bit 0 = acceptance solenoid Bit 1 = solenoid 1 Bit 2 = solenoid 2 Bit 3 = solenoid 3 activated for 500ms

238	Test output lines	Bit 0...7 = output 1...8 activated for 500ms
237	Read input lines	6 Byte 0 = DIP-Switch 1 1 = DIP-Switch 2 2 = DIP-Switch 3 3 = DIP-Switch 4 4 = external blocking 5 = general blocking, reject
236	Read opto states	Bit 0 = acceptance light barrier Bit 1 = reject light barrier
233	Latch output lines	Bit 0...7 = output 1...8 activated continuously
232	Perform self-check	Answer with ACK, no activities
231	Modify inhibit status	2 Bytes for 16 coins 0 = blocked, 1 = released, all blocked after power on
230	Request inhibit status	[inhibit 1][inhibit 2]
229	Read buffered credit or error codes	Buffer with 5 events, see also table 2 must be transmitted at least every 500 ms, otherwise the coin acceptance will be blocked.
228	Modify master inhibit	0 = coin acceptance blocked 1 = coin acceptance released
227	Request master inhibit status	[inhibit] Bit 0 gives general blocking: 0 = blocked, 1 = released
226	Request insertion counter	[count1][count2][count3] Number of inserts since power on
225	Request accept counter	[count1][count2][count3] Number of accepted coins since power on
222	Modify sorter override status	2 Byte for 16 coins cash box redirection, 0 = into cash box, 1 = normal routing, After Power on normal routing for all coins is activated
221	Request sorter override status	[override1][override2] Polling of cash box redirecting
216	Request data storage availability	[000] [000] [000] [000] [000] no more data storage available
213	Request option flags	[000] "Coin Position Format" is used
212	Request coin position	[pos1][pos2] provides inhibit vector for given coin number
210	Modify sorter path	Changes sorting path for given coin number. After power on the preset shaft is active.
209	Request sorter path	Provides sorting path for given coin number

202	Teach mode control	<p>Format (a) Transmitted data: [position] Received data: ACK</p> <p>Format (b) Transmitted data: [position] [extension] Received data : ACK</p> <p>[position] Channel 1 to 16 [extension] tolerance broadening</p> <p>Once in teach mode the device should be polled with the 'Request teach status' command to see what is happening.</p>
201	Request teach status	<p>Format (a) - default Transmitted data: [0] Received data: [no. of coins] [status code]</p> <p>Format (b) - abort teach operation Transmitted data: [1] Received data: [no. of coins entered] [status code]</p> <p>[status code] 252 - teach aborted 253 - teach error 254 - teaching in progress (busy) 255 - teach completed</p> <p>This command is used to monitor the progress of teach mode. Only when a 'teach completed' status message is received can the operation be deemed successful.</p> <p>The actual teach mechanism is under the full control of the slave device. It decides when enough coins have been entered.</p>
197	Calculate ROM checksum	[000] [000] [000] [000], no activities
196	Request creation date	Provides date of last factory programming
195	Request last modification date	Provides date of last customer programming
194	Request reject counter	[count1][count2][count3] number of rejects since power-on
193	Request fraud counter	[000] [000] [000], not supported
192	Request build code	Provides 16 ASCII codes technical specification

		192 001 provides 16 ASCII codes technical specification + n ASCII codes week/year and version. Example: 5A29.326EUR1 KW38/016 V0.06
185	Modify coin id	Actually not supported, changes are only possible using wheasy 5 from version 3.08 onwards
184	Request coin id	Provides 6 ASCII codes coin ID, for example EU200A
183	Upload window data	Answer with ACK, not supported
182	Download calibration info	Answer with ACK, not supported
173	Request thermistor reading	temperature in °Celsius
170	Request base year	„2000“
169	Request address mode	[132] Address is stored in EEPROM and can be changed
100	Coin Precision	Sub header 3 16 half bytes coded in 8 bytes starting with channel 1 in Highbyte 1 etc. 0 = wide 1 = medium 2 = narrow 3 = very narrow A = for testing purposes E = give back max. possible default setting F = no modification of current adjustments, only return Response: Z1 – Z8 current value for the acceptance band width coded for coin types 0 – 15 in half bytes.
100	Coin Precision	Sub header 4 Request of current Coin Precision
4	Request comms revision	[001][004][000] ccTalk Level 1, Specification 4.0
3	Clear comm status variables	Clears communication error counters
2	Request comm status variables	Provides 3 communication error counters
1	Reset device	Carries out software reset

4.4.2. Assigning MDB Error Codes to ccTalk Error Codes

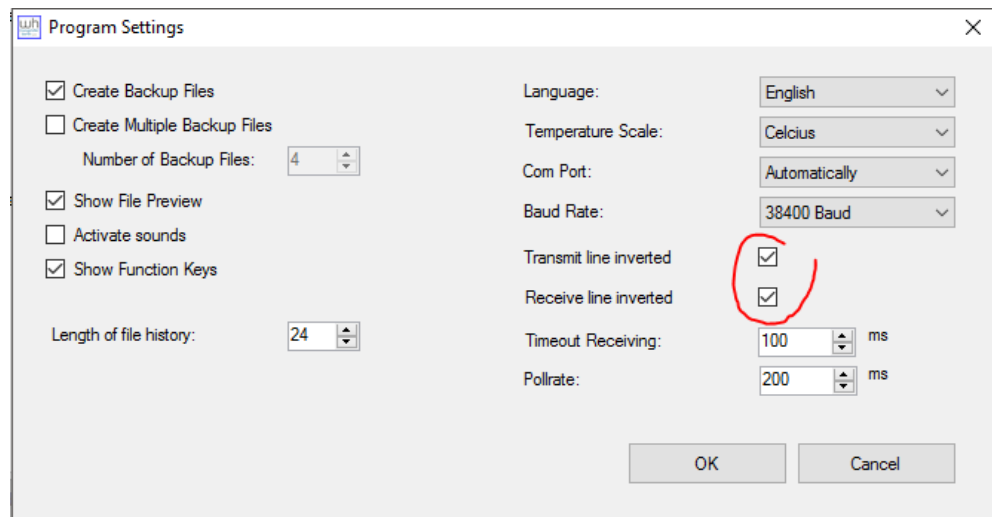
MDB	Remarks	ccTalk	Remarks
\$90	Coin return button pressed	254	Coin return button pressed
\$91	Subsequent coin	8	Subsequent coin
\$92	Coin jam 1	19	Coin too slow
\$93	Coin does not match parameter set	1	Coin rejected
\$94	MDB blocking	2	Coin blocked
\$95	Coin jam 2	19	Coin too slow
\$96	DIP switch blocking	2	Coin blocked
\$97	Coin jam 3	19	Coin too slow
\$98	Coin jam 4	19	Coin too slow
\$99	Coin jam 6	19	Coin too slow
\$9A	Rim detection error	1	Coin rejected
\$9B	Lead detection	1	Coin rejected
\$9C	Old: coin following to closely in TCAP1	255	Unknown error
\$9D	Coin-on-a-thread detection	20	Coin on a thread manipulation
\$9E	General blocking	2	Coin blocked
\$9F	EMP busy	13	Not ready

5. RS232 Interface

The EMP 500 v7 /CLB communicates through a RS232 interface. The connector used for this interface is the programming connector used.

PIN No.	Connection
1	GND
2	UB (8 ... 18 V DC)
3	
4	TDO
5	RDI

This means internally the ADM101E (Analog Devices) is used to create the correct voltages and currents. For the usage of wheasy 5 it is necessary to change the polarity of the signals:



6. Coin Selector Label

The label of the coin selector has all the necessary information required by the machine controller such as the output lines and blocking switch configurations. The following section explains and clarifies the format and legend on the label.

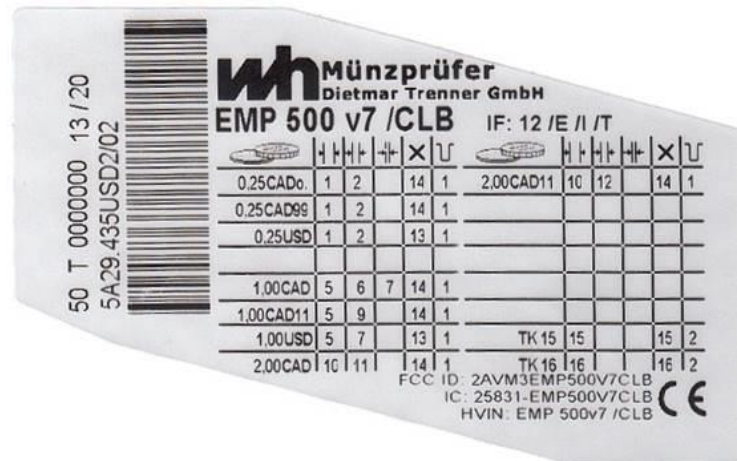


Fig. 20 Example of an EMP 500 v7 /CLB label





Below the logo is printed the exact type of coin selector. In this example: EMP 500 v7 /CLB

Close behind of the same line you find the installed options. In this example

- /E Extended temperature and humidity range
- /I Inventory impulses
- /T Teach mode

On the left, besides the barcode (turned 90°) is the serial number and the week and year of manufacture. The same information is contained in the bar code. To the right of the serial number is the number of the technical specification, that has been used when programming the device in the factory.

The remaining space on the label is devoted to the specification of the programmed coins. These specifications are in the form of a table. The columns have the following meaning:

-  Coin type (Value und currency)
Teach mode channels are marked with TKn. "n" = number of blocking switch, which has to be used to activate the teach mode for this channel.
-  Blocking switch for the broad channel
-  Blocking switch for the narrow channel
-  Blocking switch for the very narrow channel

- ✕ Blocking switch for a coin type or coin group (currency)
- ⌋ Output line

7. Maintenance

The EMP 500 v7 /CLB is an extraordinarily robust coin selector and operates relatively maintenance free. However, it should be cleaned at regular intervals especially if it is operating in an environment with high levels of dust, smoke or nicotine. The cleaning intervals are of course dependent on the level of air borne contaminants.

Modest use with minimum contaminant levels indicate the need to clean the top of the coin path once a year. Open the coin path door and wipe the exposed surfaces with an alcohol moistened cloth. Also lukewarm water with a little washing-up liquid may be used. It is important that no dirt is pushed inside the openings of the optical sensors. The light sensors may be cleaned with a soft brush or air duster spray.



Make sure that the coin selector is without power during the cleaning.

Use a damp not wet - cloth. Under no circumstance's liquid should run into the coin selector.



Avoid solvent or abrasives which may affect the plastic material.

Never use an oily rag! Never lubricate the solenoid, hinge joints etc.!

8. EC Conformation Declaration

EC-declarations of conformity on directive 2004/108/EG, attachment IV

(Electromagnetic compatibility (EMC))

Name of supplier: **wh Münzprüfer Dietmar Trenner GmbH**

Address: **Teltower Damm 276, 14167 Berlin**

Declares under its sole responsibility and based on a sample testing (type testing), that the product

Product name: **EMP 500 v7 /CLB**

Type: with interfaces 00, 01, 04, 06, 07, 12 and 13

corresponds to the following laws, standards, security rules and guidelines:

EN 61000-4-2:2009-12 Electromagnetic compatibility (EMC)

Part 4-2: Testing and measurement techniques; Electrostatic discharge immunity test

EN 61000-4-4:2013-04 Electromagnetic compatibility (EMC)

Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test

EN 61000-6-1:2016-05 Electromagnetic compatibility (EMC)

Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments

EN 61000-6-2:2016-05 Electromagnetic compatibility (EMC)

Part 6-2: Generic standards - Immunity for industrial environments

EN 55014-2:2016-01 Electromagnetic compatibility

Requirements for household appliances, electric tools and similar apparatus -

Part 2: Immunity - Product family standard

Date: 21.10.2019

Signatures:



Ch. Trenner
Managing Director



B. Weickmann
Head R&D

9. Compliance Statements FCC / ISED for EMP 500 v7 /CLB

FCC ID: 2AVM3EMP500V7CLB

IC: 25831-EMP500V7CLB



9.1. USA - User Manual Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

9.2. Canada – User Manual Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

This device may not cause interference.

This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

L'appareil ne doit pas produire de brouillage;

L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

10. Appendix

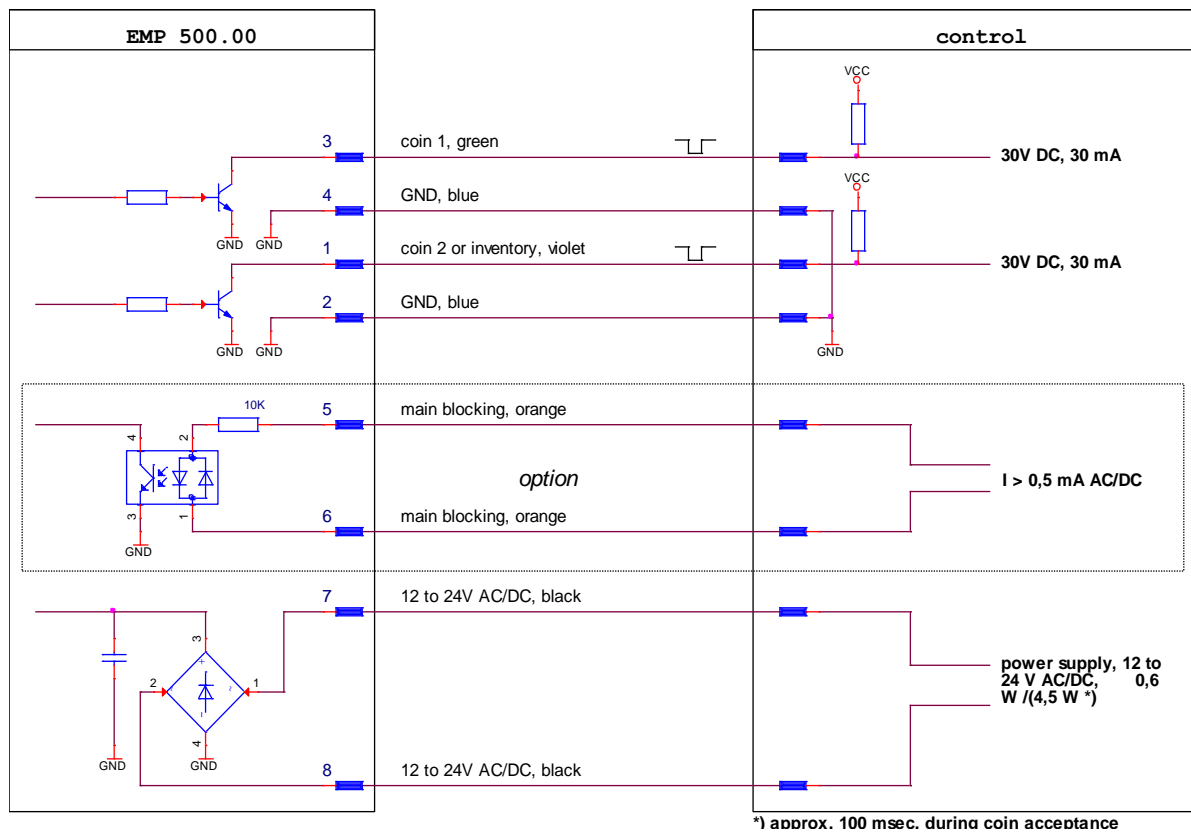


Fig. 21 Connecting diagram EMP 500 v7 /CLB with interface 00

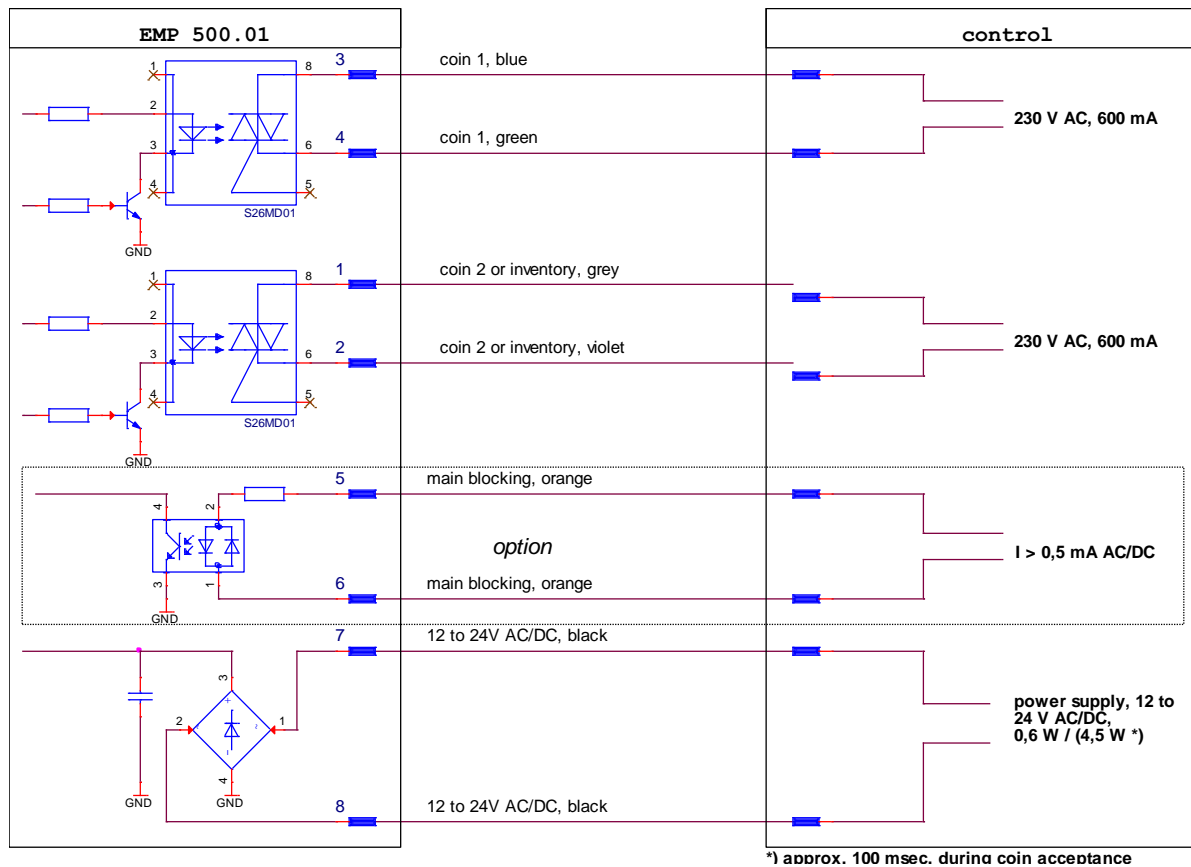


Fig. 22 Connecting diagram EMP 500 v7 /CLB with interface 01

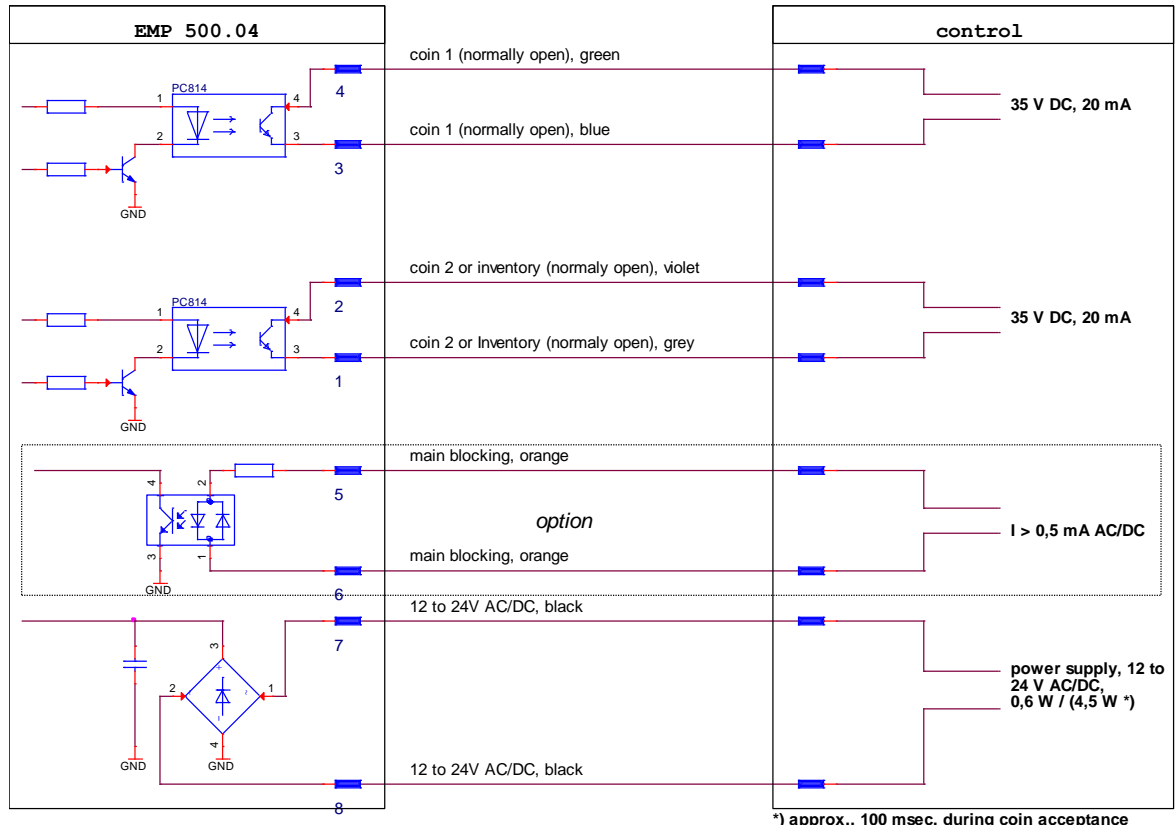


Fig. 23 Connecting diagram EMP 500 v7 /CLB with interface 04

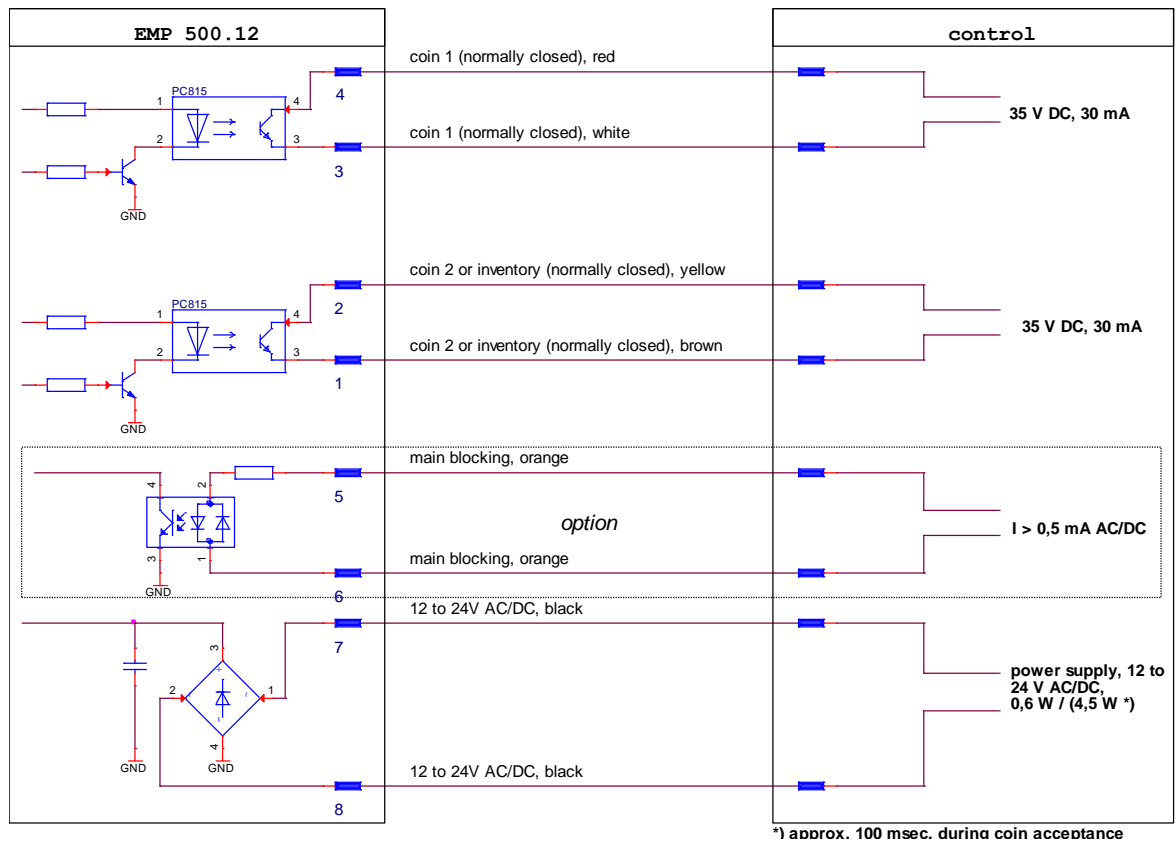


Fig. 24 Connecting diagram EMP 500 v7 /CLB with interface 12

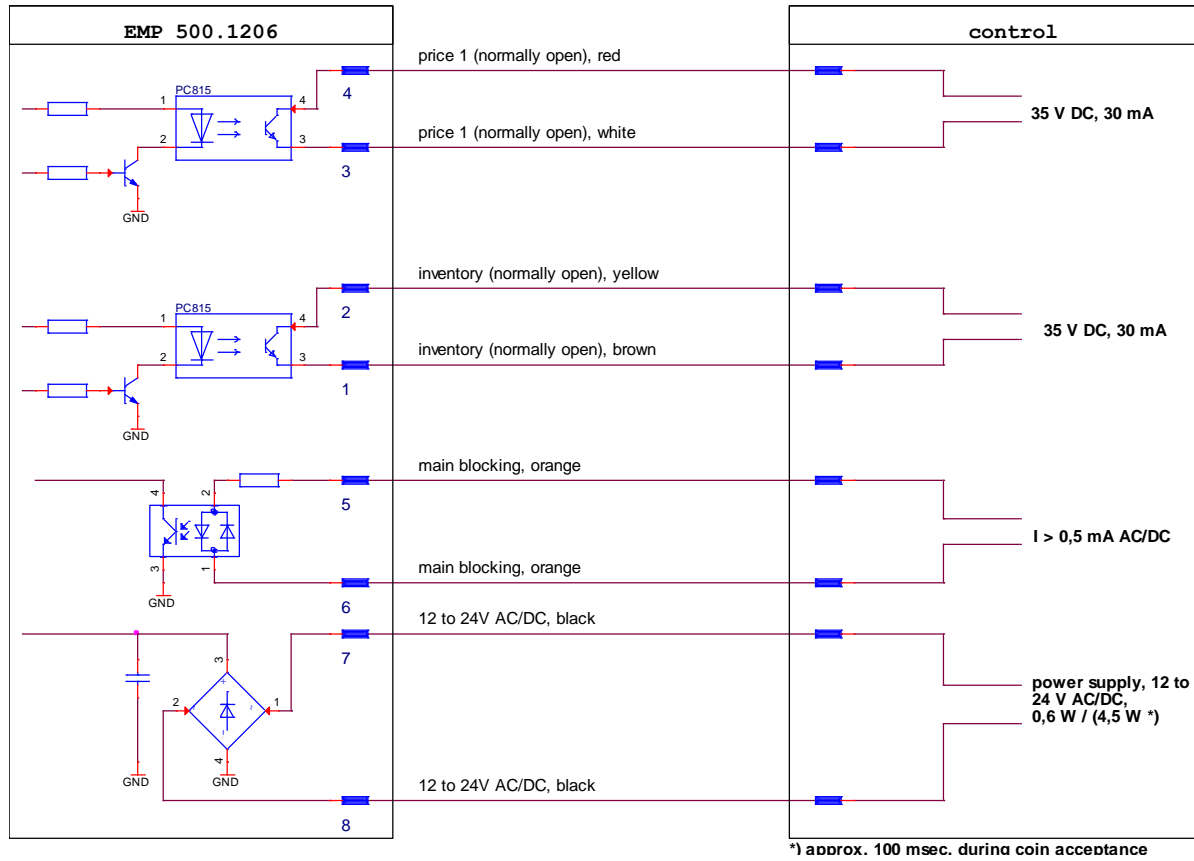


Fig. 25 Connecting diagram Totalizer EMP 500 v7 /CLB with 1206

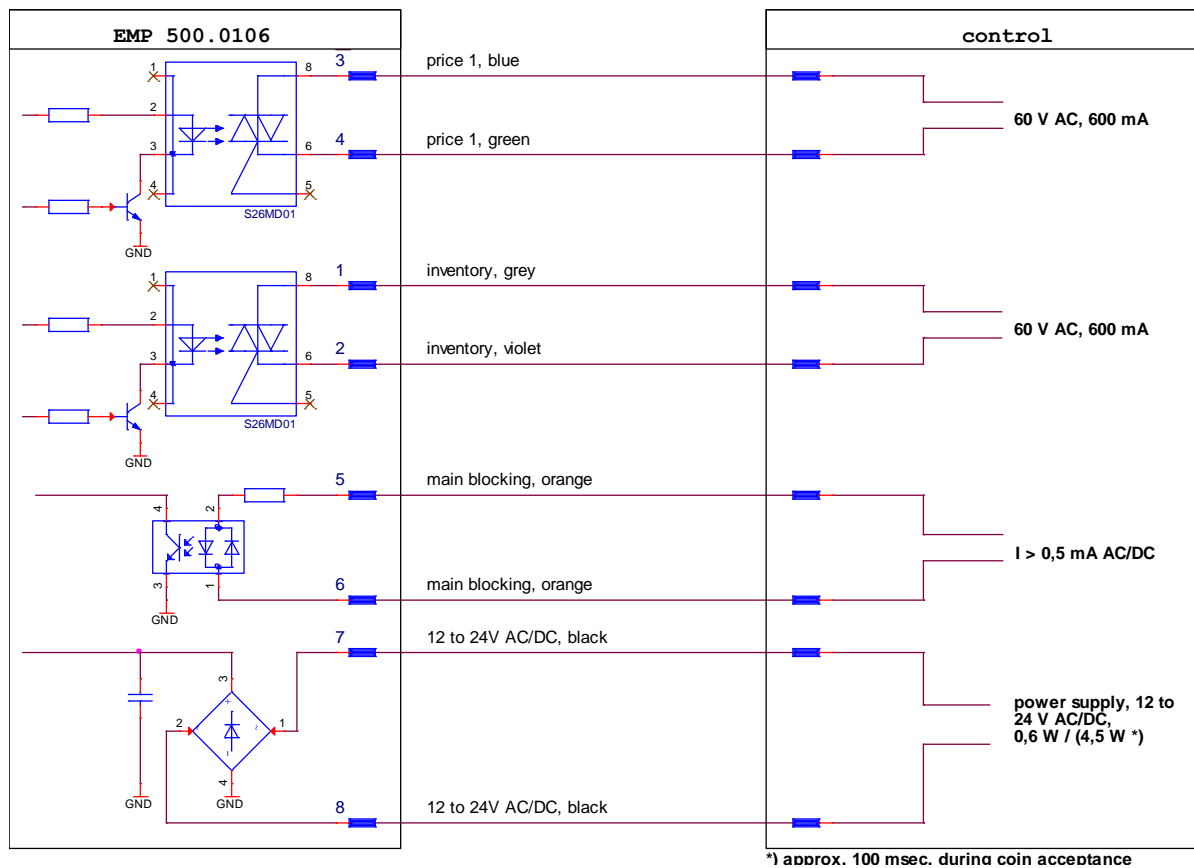


Fig. 36 Connecting diagram Stepper EMP 500 v7 /CLB with interface 0106

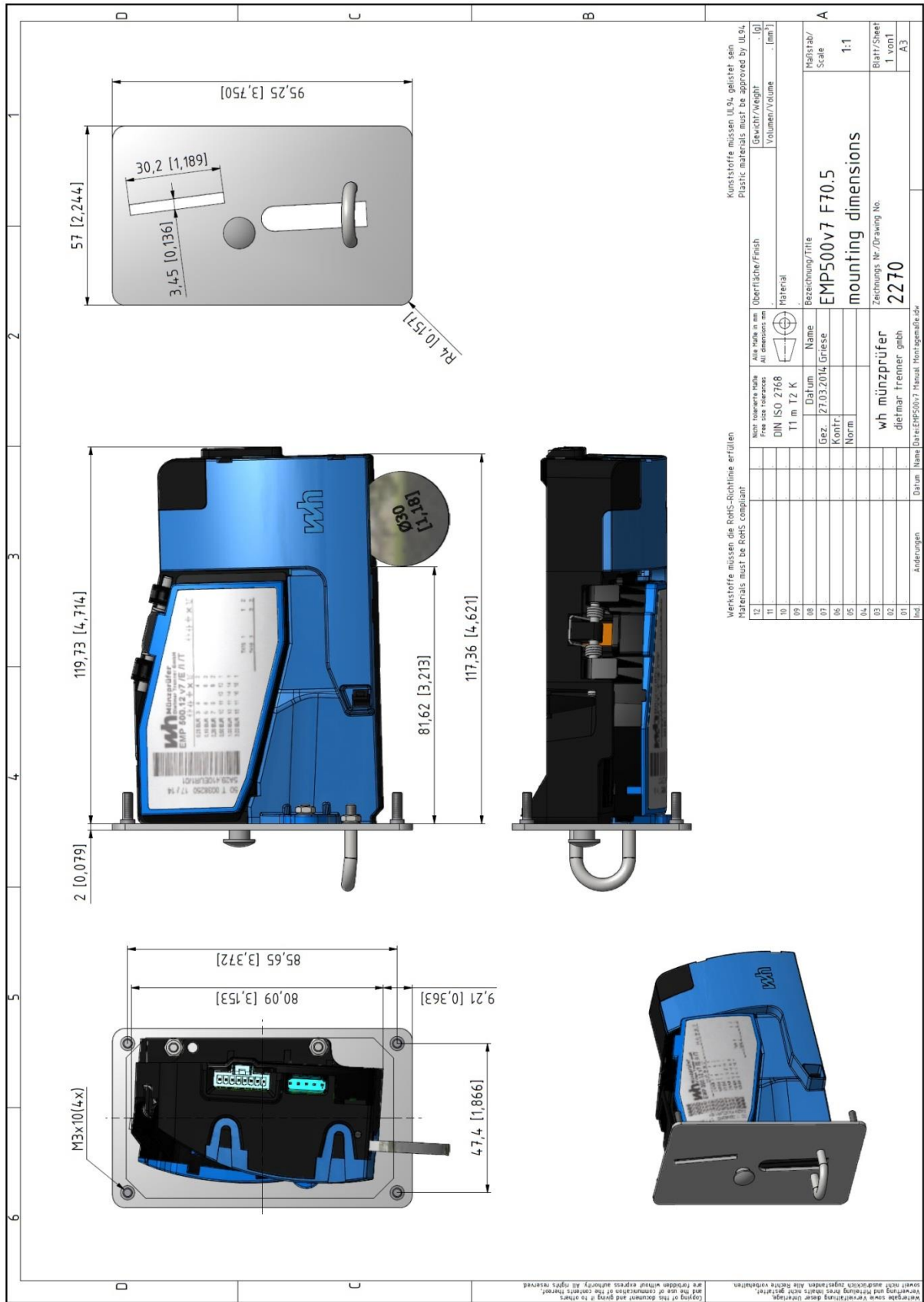


Fig. 37 Dimensions of EMP 500 v7 with front plate F70.5

11. Applications

Example 1: Dryer

present application: mechanical coin selector with optical switch, e.g. model: F70-W7005-i4 for 25 Canadian Cent (0.25 CAD)

future application: electronic coin selector, e.g. model: EMP 500 v7 /CLB with interface 04 /E/I/T with front plate F70.5 for the acceptance of US and Canadian Dollars as well as two tokens for on-site programming.



Programming

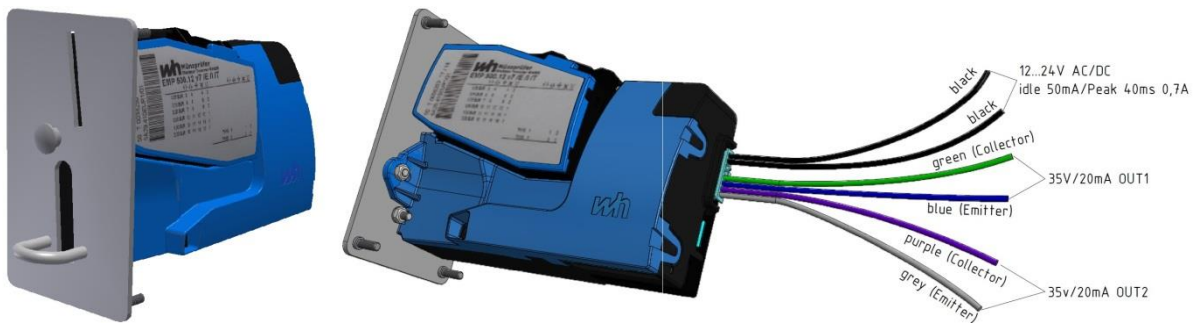
pulse length: 50 ms pulse pause: 100 ms

coins	blocking switch no.			number of pulses	output line	notes
	wide	mid	narrow			
0.25 USD	1	2		1	1	total blocking of USD via switch number 14
1.00 USD	5	6		4	1	
0.25 CAD	1	2		1	1	total blocking of CAD via switch number 13
0.50 CAD	3	4		2	1	
1.00 CAD	5	6	9	4	1	
2.00 CAD	10	11		8	1	
STD-118-1 (.880)	15			1	2	teach mode channel
STD-118-5 (.990)	16			1	2	teach mode channel

Example 2: Washer

present application: mechanical dual selector with micro switch, e.g. model: SF03.2-W-A-S /-W-A-S for 0.20 and 1.00 British Pound Sterling

future application: electronic coin selector, e.g. model: EMP 500 v7 /CLB with interface 04 /E/T with front plate F 503 for the acceptance of British Pound Sterling and Euro as well as two tokens for on-site programming.



Programming

pulse length: 50 ms pulse pause: 100 ms

coins	blocking switch no.			number of pulses	output line	notes
	wide	mid	narrow			
0,10 GBP	1	2		1	1	total blocking of GBP via switch number 14
0,20 GBP	1	2		2	1	
0,50 GBP	1	3		5	1	
1,00 GBP	4	5	6	10	1	
2,00 GBP	4	5	7	20	1	
STD-118-1 (.880)	15			1	1	teach mode channel
0,10 EUR	9	10		1	2	total blocking of EUR via switch number 13
0,20 EUR	9	10		2	2	
0,50 EUR	9	10		5	2	
1,00 EUR	9	11		10	2	
2,00 EUR	9	12		20	2	
STD-118-5 (.990)	16			1	2	teach mode channel