Technical Manual

ELECTRONIC COIN SELECTOR
EMP 500.xx v4

- Version 1.5 -

0.   Safety Precautions

You are advised to observe the safety information during operation, maintenance and repairing of electronic coin selectors of the EMP 500 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, *w*h Münzprüfer 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 electronic coin selector EMP 500 has been especially designed for coin-operated machines in which a mechanical coin selector has traditionally been fitted. The mechanical dimensions fundamentally correspond to those of our mechanical coin selector W2000. We offer a full range of front plates to ensure that no alteration of the front-plate cut-out is required on the machine.

The electrical outputs of the EMP 500 have been especially designed to facilitate the substitution of mechanical coin selectors, ensuring that only with minimal technical amendments are required.

The coin selector has an operation voltage of 11 to 24 V AC or DC and is fitted with switching outputs that – depending on version used – can totally replace the micro switches or optocouplers of the mechanical coin selectors.

1.1.   Technical Data

1.1.1   The Connectors of the EMP 500.xx

The EMP 500.xx v4 has 32 in-built coin channels and has 2 output lines. Coin output assignment to the output lines can be freely programmed.

- EMP 500.00 v4
  open collector outputs
  30 V, 30 mA, U_{CEsat} < 800 mV

- EMP 500.01 v4
  solid state relay outputs
  230 V AC, 600 mA

- EMP 500.04
  galvanised separated infra-red optocoupler outputs, output transistors closed in standby
  35 V , 20 mA, U_{CEsat} < 100 mV
  maximum potential difference = 350 V DC

- EMP 500.12 v4
  galvanised separated infra-red optocoupler outputs, output transistors open in standby
  35 V , 30 mA, U_{CEsat} < 1 V
 maximum potential difference = 350 V DC

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 then 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 programming of electronic coin selectors of the series EMP 500 is done via the serial connector. Our Windows™ PC software wheasy2 or our software whpocket for the Palm OS® organizer are available for this purpose.

Note: wh Münzprüfer maintains a policy of continuous research and development and unconditionally reserves the right to technically modify the EMP 500 v4 series coin selector and the *w*heasy 2 software / whpocket at any time.

The electronic coin selector EMP 500.xx v4 is available with the following front plates:

Front plate **F503**	117 x 60 mm	(height x width)
Front plate **F70.5**	92,25 x 57 mm	
Front plate **F94.5**	101 x 88,5 mm	
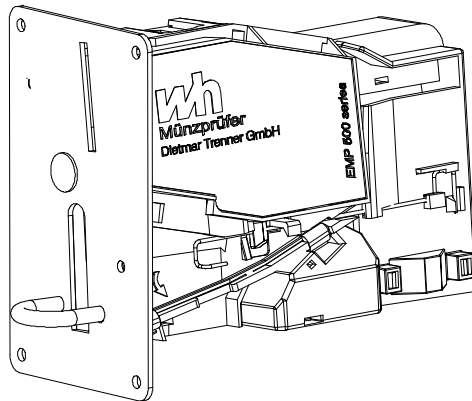
EMP 500 with Front Plate F 70.5
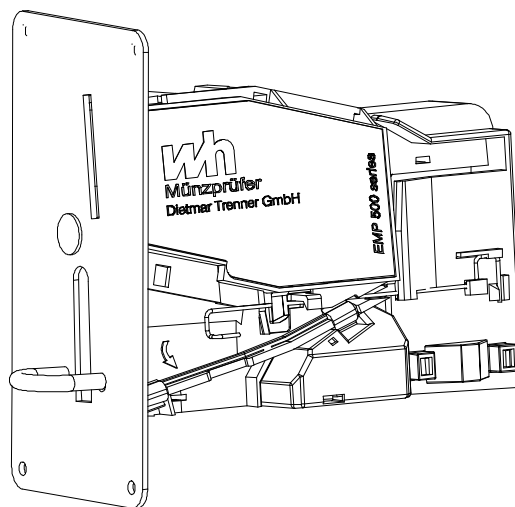
EMP 500 with Front Plate F 503

1.1.2   Technical Overview of the EMP 500.xx v4

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.
output signals	Two coin output signals, open collector, optocoupler or solid state relays. Each output line can be freely assigned to any of the 16 master coin channels through programming. Please note that the number of coin pulses per coin can be freely programmed as well.
output pulse length	50 ms (±2%) to 10 seconds, programmable, pulse / pause interval programmable.
supply voltage	11 V to 24 V AC / DC
power supply	Maximum 0,6 W standby, during coin acceptance 4,5 W for approx. 100 ms
temperature range	+10°C to +70 °C
humidity classification	according to DIN 40040: F
max. coin sizes	diameter: 30 mm thickness: 3.3 mm
dimensions	(without front plate) height: 77.3 mm width: 40 mm depth: 125 mm

Options

/E	extended temperature and humidity range –20°C to +70°C, humidity classification E/D:
/I	inventory impulse
/T	teach mode (2 coin channels activated)
/U	Potential free complete coin blocking via optocoupler to the machine controller

2.   Function of the Coin Selector

2.1.   Introduction

This chapter gives directions for preparing the EMP 500 v4 for programming. Please conform to all safety precautions before making changes to the unit.

Please note that all setting / programming of our electronic coin selectors may be carried out at the factory or by any authorised "*w*h Münzprüfer Service Centre."

Note: 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 *w*heasy 2 programming manual and the programming software are available and that the operator is familiar with them. References here to *w*heasy 2 software, are only made relative to its specific application to the particular coin selector and its functions.

To power up the EMP 500 v4 and the associated PC interface, we strongly recommend our N 780 power supply for this purpose. The power supply must be set to the 12 V position for programming and testing the EMP 500 v4. The coin selector is connected to the dongle (interface converter) with the cable provided with the software to the N 780 power supply. The dongle is connected to an available COM 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 K518/1800, which is not supplied with the standard *w*heasy kit.
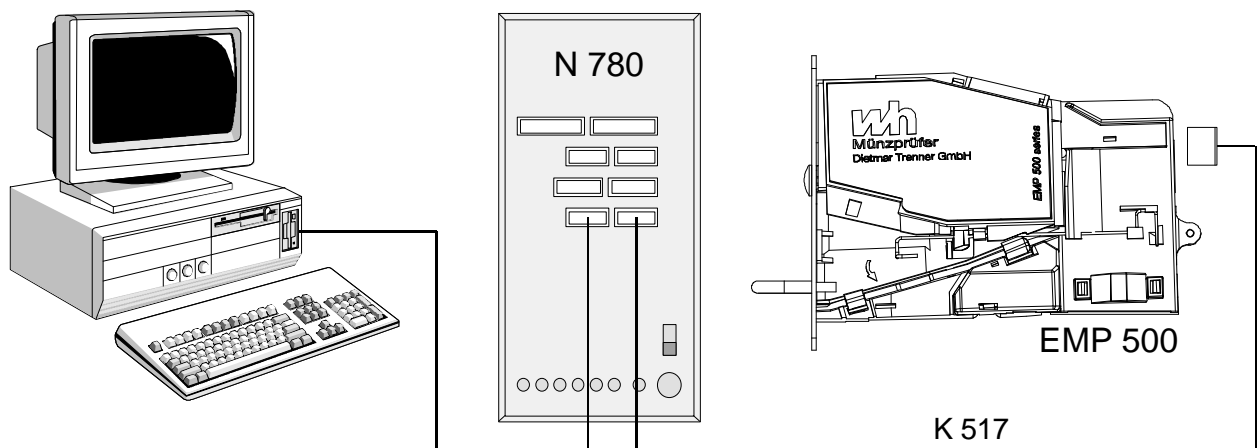

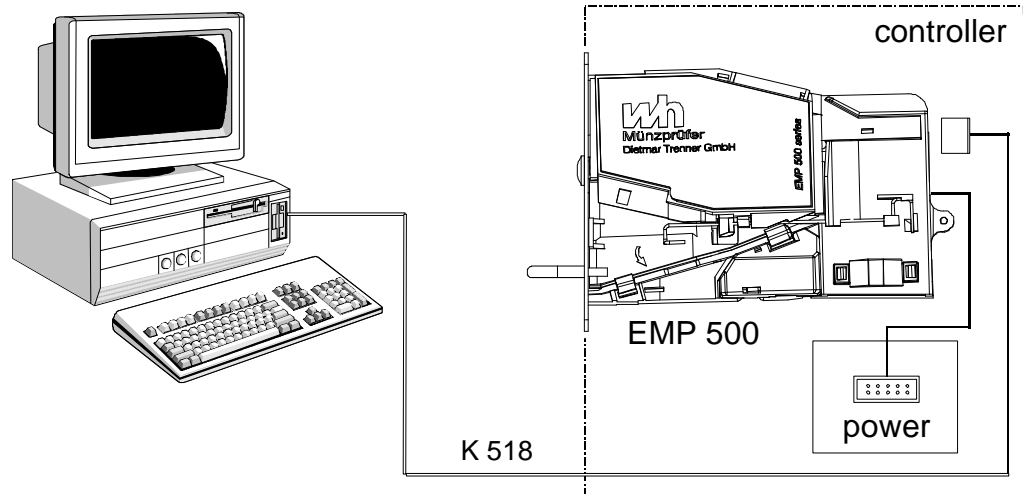Figure 1: Connection of the coin selector with the N 780 and the PC

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

Note: 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 *w*heasy 2 manual.

Please also note the information on the coin selector decal.

It is important that the coin selector be located in an upright stance 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 vending machine. Alternatively, wh Münzprüfer can provide you with a purpose designed stand T 500.

The following sections detail each *w*heasy 2 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 of Coins

There are a variety of ways in which the coin acceptance of the EMP 500 v4 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 2 software or directly in the vending machine using the Teach mode Function (see On site programming) or using whpocket for the Palm OS® organizer.

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 *w*h Münzprüfer.

The wheasy 2 cloning function also allows the transfer of a data set from a factory set coin selector to any electronic coin selector in the same series. In this way identical programming may be duplicated for all units, as required, especially for new currencies.

2.2.1.   Calibration

2.2.1.1.   Calibration Using wheasy 2

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:
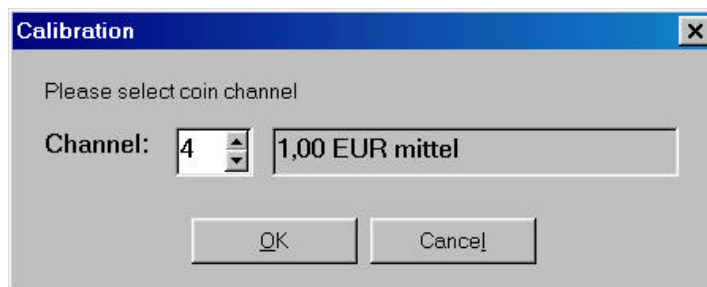
Figure 3 Window for selecting the coin channel to be calibrated.

Next, 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.

Note: The coin description shown is taken from the loaded file for the particular channel. Specifically, the correct description is shown only if the correct file for the coin selector has also been loaded.

The calibration window is displayed only after a coin channel has been selected. The calibration tolerance mode for the chosen channel is also shown, but this may be changed at any time prior to pressing OK.

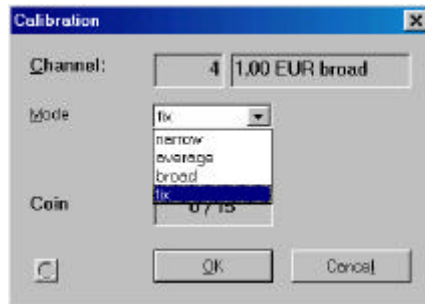Figure. 4 Calibration window for EMP 500 v4 coin selector

The calibration mode "fix" is intended for use with coins and coin channels for which preset tolerance parameters are available. These parameter sets can be seen by selecting the menu selection "Coin Overview". Please refer to the *w*heasy 2 programming manual for more information, but 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.

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 have been inserted and the procedure may now be finished or another coin channel selected for calibration.

2.2.1.2.   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 (left DIP switch block) 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 of the left DIP switch block corresponds to channel 1 and right DIP switch of the right DIP switch block corresponds to channel 16.

The coin channel must be chosen <u>after</u> 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.

Note: 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.
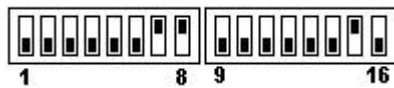

Figure 5 Example DIP switch settings for teaching channel 15 with narrow tolerances.

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** 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 magnet 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 magnet 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 is possible to program it in the narrow setting (inhibit switch 7 is ON).

8. **Insufficient coins** being inserted will result in the magnet 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.

2.2.2. 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 *w*h 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. *w*heasy 2 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 *w*h Münzprüfer if *w*heasy 2 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.
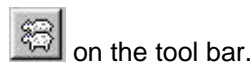
The following window opens up after selecting the function "EMP Cloning":
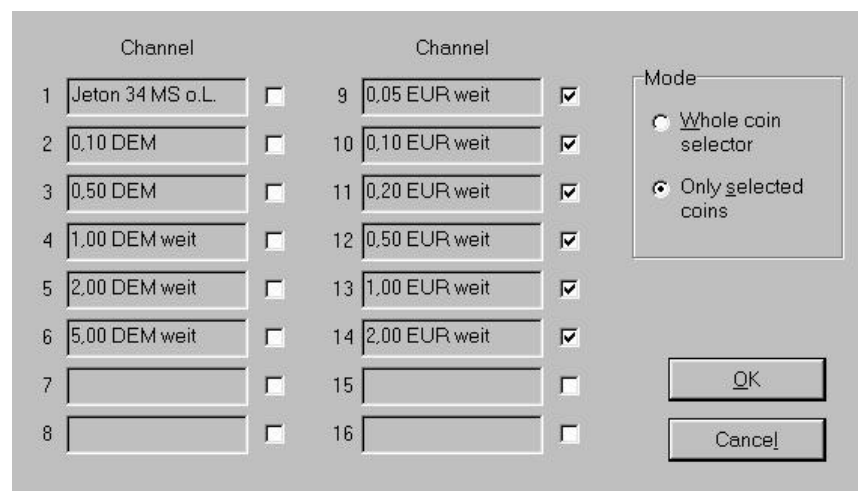

Figure. 6 Window "EMP Cloning"

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. This procedure can also be carried out with a coin selector that is set up for multiple currencies. For example, should you need to update the Euro coins while, at the same time, retaining the national currency you simply select "Only selected coins" and activate the check bottoms for the Euro coins.

The actual cloning process takes about 15 seconds after the OK button has been pressed.

2.3.   Coin Selector Output Signals

There are 2 parallel coin output channels on the EMP 500 v4. They can be freely assigned in any combination to the 16 master channels. This means that each coin channel can have multiple output channels 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 channel(s) as the associated master channel.

The coin selector signals gives the corresponding number of pulses on the respective output channel. The pulse widths and the pulse intervals of the coin output signal can be programmed in the following steps:

50 ms, 100 ms, 200 ms, 500 ms, 1 sec, 2 sec, 5 sec and 10 sec

The pulse timing can be programmed using wheays2 under "configuration" – "B values" and then via "receipt".

The programming of the output lines can be done via the menu point "edit" – "output channels".

Note: If a coin channel has no output channel programmed to it, then the coin will be accepted but no accept signal will be generated on the parallel interface. The EMP 500 v4 has been designed only with output lines 1 and 2. Other electronic coin selectors have up to 8 coin output channels (EMP 770, EMP 780, EMP 800).

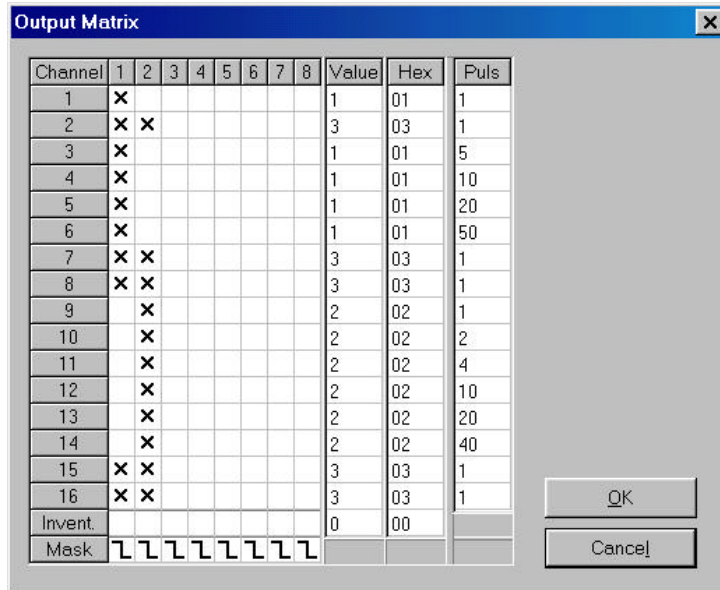| Channel	1	2	3	4	5	6	7	8	Value	Hex	Puls
1	×								1	01	1
2	×	×							3	03	1
3	×								1	01	5
4	×								1	01	10
5	×								1	01	20
6	×								1	01	50
7	×	×							3	03	1
8	×	×							3	03	1
9		×							2	02	1
10		×							2	02	2
11		×							2	02	4
12		×							2	02	10
13		×							2	02	20
14		×							2	02	40
15	×	×							3	03	1
16	×	×							3	03	1
Invent.									0	00	
Mask	⌐	⌐	⌐	⌐	⌐	⌐	⌐	⌐			

Figure 7: Programming Window for the Output Channels

The figure shows the 16 coin channels (horizontally) and the 8 output channels (vertically). Please note that the EMP 500 v4 only uses two output channels.

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

The output channel on which the inventory pulse can be given can be chosen on the "Invent." line. "Mask" allows you to decide whether the output should be open or closed in standby. This is essential for the configuration of the infrared optocoulper output lines.

2.3.1.   Inventory Impulse (Option /I)

The EMP 500 v4 may be programmed to release an inventory or credit impulse. This inventory impulse is intended for the counting and logging of accepted coins. The impulse length and impulse pause are separately programmable in the range of 1 to 255 ms. The factory set standard is an impulse duty factor of 50 ms/50 ms. Please note that only one specific coin output signal can be used when this option is chosen.

*w*heasy 2 can be used to activate "Inventory Impulse". The checkbox can be found under "Configuration", "B-Values" as part of the "Receipt" dialog box. The value is set under "Edit", "Coin Values" in the field "S.Value".

2.4. 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 is 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.

2.4.1. General Blocking (Option /M)

The EMP 500 v4 has a potential-free infrared optocoupler at its disposal for the general blocking. The inhibit voltage depends on the coin selector hardware and lies between 12 and 230 V AC/DC. It is standard that the coin selector is blocked when the infrared optocoupler is powered up. This is known as "general blocking via low" for the coin selector programming with wheasy2.

The signal polarity of the blocking line is programmable. The programming can be carried out using *w*heasy 2 under the menu selection "Configuration". Select "B-Values", select the register tab "Mode." This tab, among other things, has a check box for "Main blocking with 0" and "Main blocking with an open input." The following table shows the possible combinations of the above two options.

selected check box		Infrared optocoupler input	
general blocking with "0"	general blocking with an open input	powered	not powered
			X
X		X	

Table 1   The function of general blocking in relationship to the programmed mode of the coin selector

As the EMP 500 v4 has an infrared optocoupler only the two recommended settings are shown in Table 1.

Note: Please inform us when ordering if the inhibit voltage is to be at 115 V or 230 V otherwise it must be ensured that on the coin-operated machine the current is limited from 1 mA to 10 mA.

2.4.2. 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 two 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.
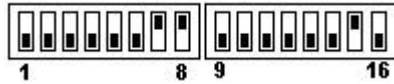
Figure. 8   Blocking assignment.

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

The programming of the blocking switches is done with *w*heasy 2 and is explained in the *w*heasy 2 technical manual.

2.5.   Coin Values

Each coin programmed into the coin selector is also given a coin value. This value may be used for the inventory impulses. Most importantly programming the coin values display a check on what is already programmed in coin selector including channel assignments.

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 "Edit" 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 rest is just stored as part of the data on the PC and is used to better describe and understand each channel while working with *w*heasy 2.
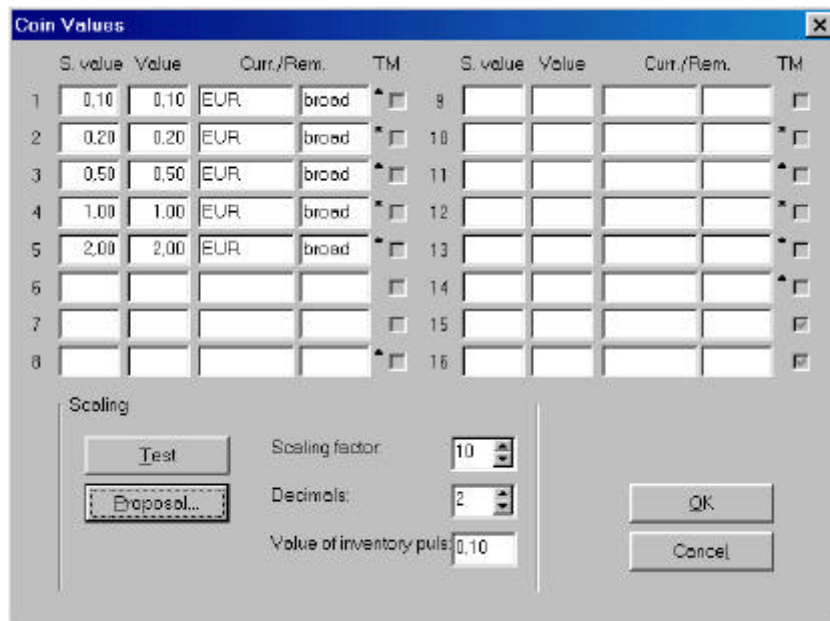

Figure. 9 Window for "Coin Values"

The individual fields are defined as follows:

- S.Value (Calculated Coin value)
  A calculated coin value is the value transferred to the coin selector. The calculated coin value represents the inventory value.

- 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 *w*heasy 2.

- Curr. (Currency)
  The currency description is not stored in the coin selector. However, it is still important to have this description when working with *w*heasy 2 because a coin selector may be programmed to accept multiple currencies.

- Rem. (Remark)
  The remarks are not stored in the coin selector. They serve to provide a better overview when working with *w*heasy 2. Supplementary information such as "broad" or "narrow", "old" or "new", or "before 74" or "64-76" etc. may be entered here.

- TM (Teach mode)
  This choice enables the coin selector mounted DIP switch teach mode function for a channel. This mode is activated when the appropriate box shows a "√ ".

From the series v4 onwards a star (*) may be shown to the left of the "TM" checkbox. The star indicates that this master channel also has a slave channel associated with it (See section 2.6).

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. The vending machine may read these values during a status request. This is not significant for the EMP 500 v4.

- Decimals
  A decimal point location is likewise transferred to the vending machine during a status request as part of the MDB protocol. This value tells the vending machine how many digits to use after the decimal point as part of the coin value. This is not significant for the EMP 500 v4.

- Set Value
  A set value represents one impulse when inventory pulses are generated. For those coin selectors that calculate prices and the price is set up via the binary price switches, the set value is also used as the multiplication factor.

- Test button
  This button is used to let *w*heasy 2 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 is not significant for the EMP 500 v4.

- Proposal button
  *w*heasy 2 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 is not significant for the EMP 500 v4.

2.6.   Slave Channels

The generation v4 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 carried out in *w*heasy 2 with the "Edit" pull down and then selecting "Slave channel." This is discussed in the *w*heasy 2 manual.

The slave channels share the following attributes with the associated master channel:
- Output channel. This means that the slave channel will always signal the same output line as the associated master channel.
- Coin Value
- Sorting shaft

2.7.   Coin Return

The coin selector EMP 500 v4 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 *w*heasy 2 manual in the "Edit" chapter, under the sub-heading "Sorting Shafts."

2.8.   Safety Features

2.8.1.   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 channels or a combination of channels 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 impulse width of 200 ms. 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 ms have passed, the information will be repeated. During that time, no coin can be accepted.

2.8.2.   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 channels or a combination of channels through which coin jamming will be signalled. This can be programmed by the factory. The information is emitted by a minimum impulse width of 200 ms. 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 v4)
- 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 v4)
- Coin jam 6 (not used on EMP 500 v4)

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

3.   The 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.

Figure 10   Example of an EMP 500 v4 Label

At the top is printed the exact type of coin selector. In this example:

EMP 500.04 v4

The next line contains the installed options, which are separated by a "/".

/T   Teach mode
/E   Extended temperature and humidity range

Along the right margin are the serial number and the week and year of manufacture. The same information is contained in the bar code.

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 and 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

4.   Maintenance

The EMP 500 v4 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. The light sensors may be cleaned with a soft brush or air spray duster.

5.   EC Conformation Declaration

Product name: EMP 500.00 v4, EMP 500.01 v4, EMP 500.04 v4 and EMP 500.12 v4.
Date: 24/01

Harmonized European Standard:

EN 50081-1
EN 55014-2
EN50082-1 (Criterion B for Level 2, Criterion C1 for Level 3)

IEC-Standard

IEC 801-4 (Criterion B for Level 2, Criterion C1 for Level 3

The EC Standard Specifications which are still in the process of being developed have applied up to now for finished products and their bringing into circulation. Tests are effected according to the EMC regulations, which means certification of electromagnetic compatibility and, if applicable, of interference (emission). The tests have been realized according to EN 50082-1 and EN 50081-1. These tests grant, that electronic coin selectors of type EMP 500.00 v4, EMP 500.01 v4, EMP 500.04 v4 and EMP 500.12 v4 meet general regulations. However, they do not exempt the seller of the machines from his duty of care as there are still some other important characteristics of the machine which could impede the EM conformity or restrict it.
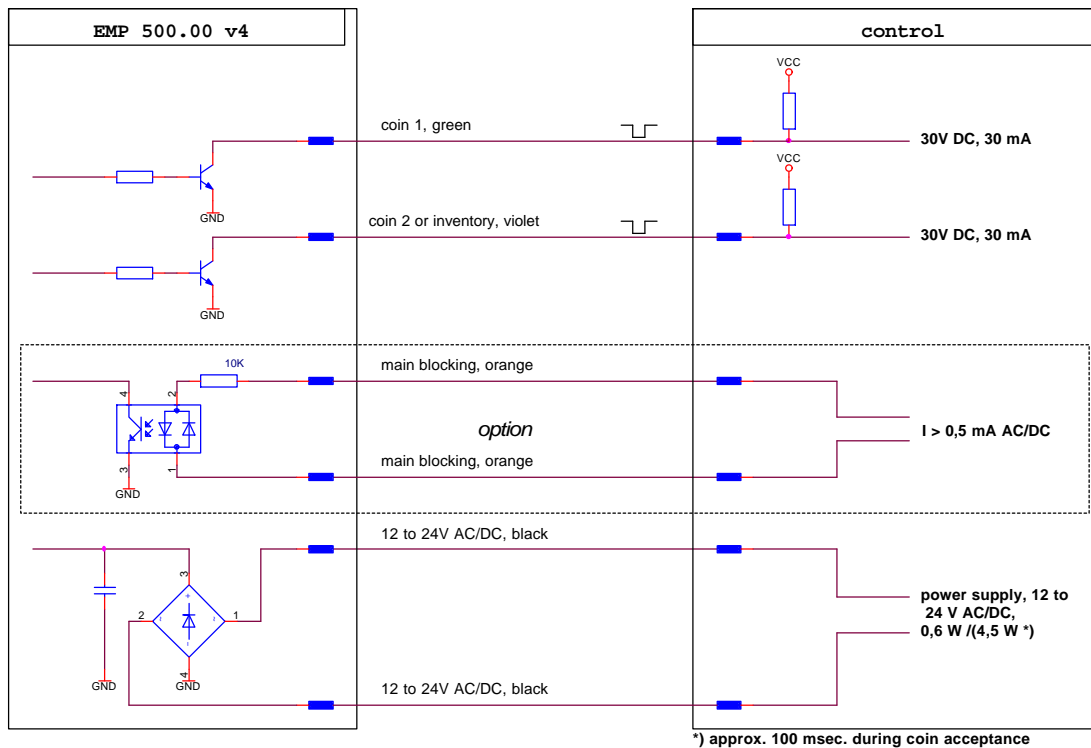
6. Appendix

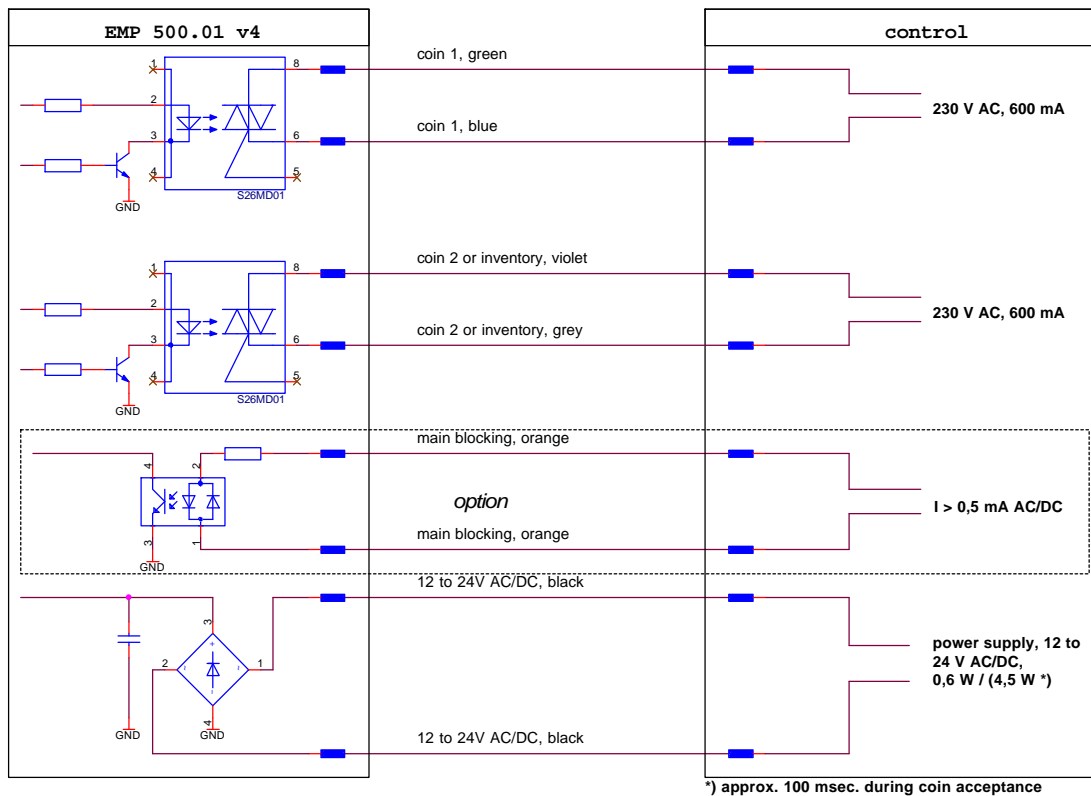Figure 11   Connecting diagram EMP 500.00 v4

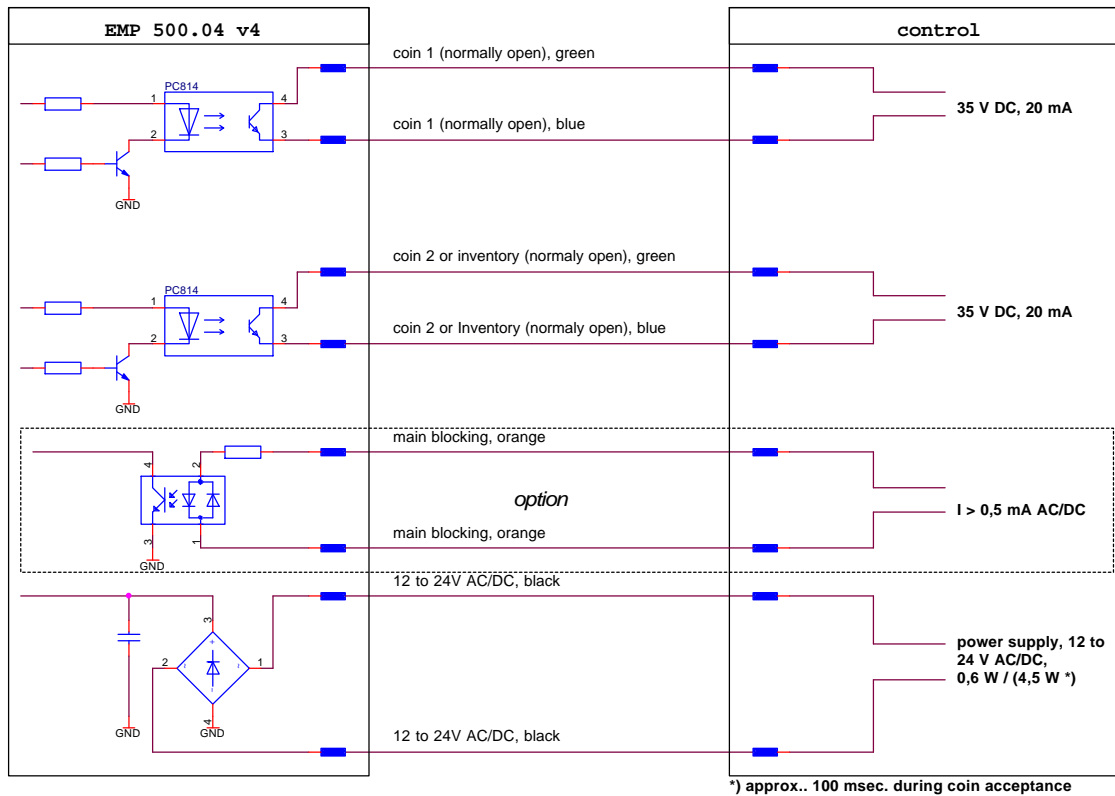Figure 12   Connecting diagram EMP 500.01 v4

EMP 500.04 v4		control

coin 1 (normally open), green

PC814

35 V DC, 20 mA

coin 1 (normally open), blue

GND

coin 2 or inventory (normaly open), green

PC814

35 V DC, 20 mA

coin 2 or Inventory (normaly open), blue

GND

main blocking, orange

option

I > 0,5 mA AC/DC

main blocking, orange

GND

12 to 24V AC/DC, black

power supply, 12 to 24 V AC/DC, 0,6 W / (4,5 W *)

GND   GND

12 to 24V AC/DC, black

) approx.. 100 msec. during coin acceptance

Figure 13   Connecting diagram EMP 500.04 v4

EMP 500.12 v4		control

coin 1 (normally closed), red

PC815

35 V DC, 30 mA

coin 1 (normally closed), white

GND

coin 2 or inventory (normally closed), red

PC815

35 V DC, 30 mA

coin 2 or inventory (normally closed), white

GND

main blocking, orange

option

I > 0,5 mA AC/DC

main blocking, orange

GND

12 to 24V AC/DC, black

power supply, 12 to 24 V AC/DC, 0,6 W / (4,5 W *)

GND   GND

12 to 24V AC/DC, black

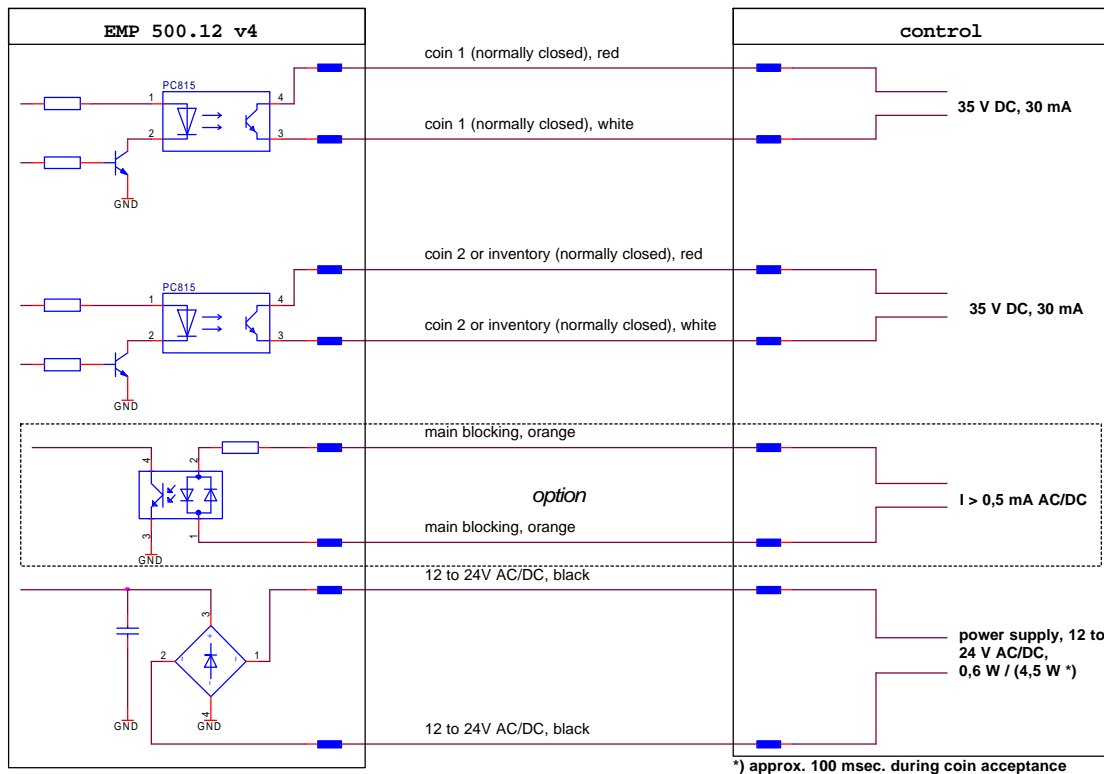**) approx. 100 msec. during coin acceptance**

Figure 14   Connecting diagram EMP 500.12 v4
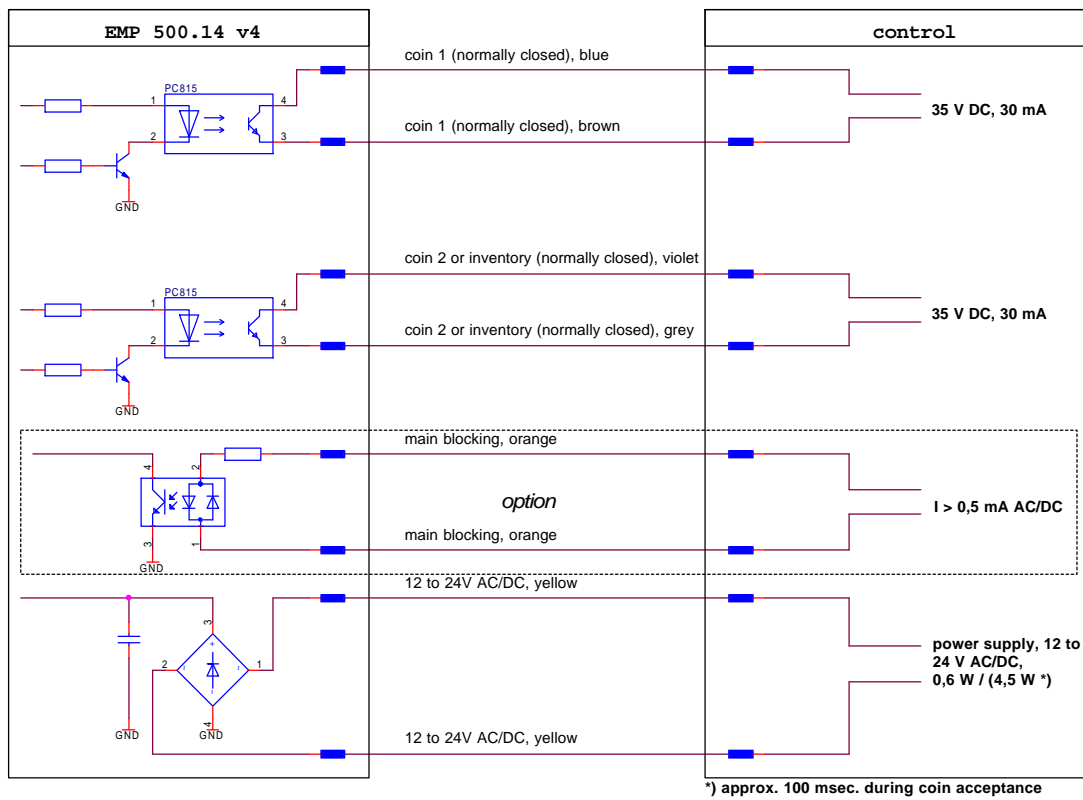
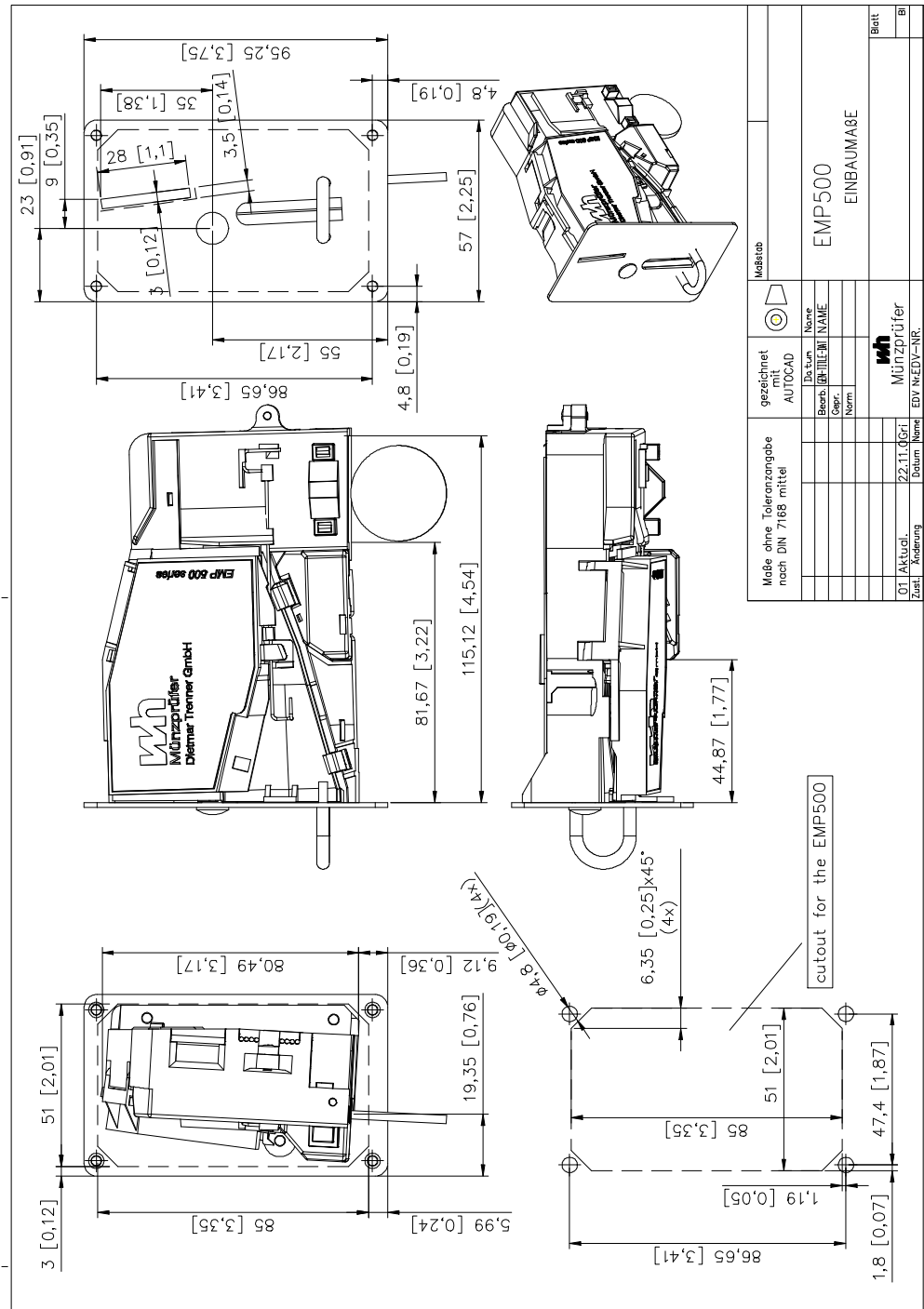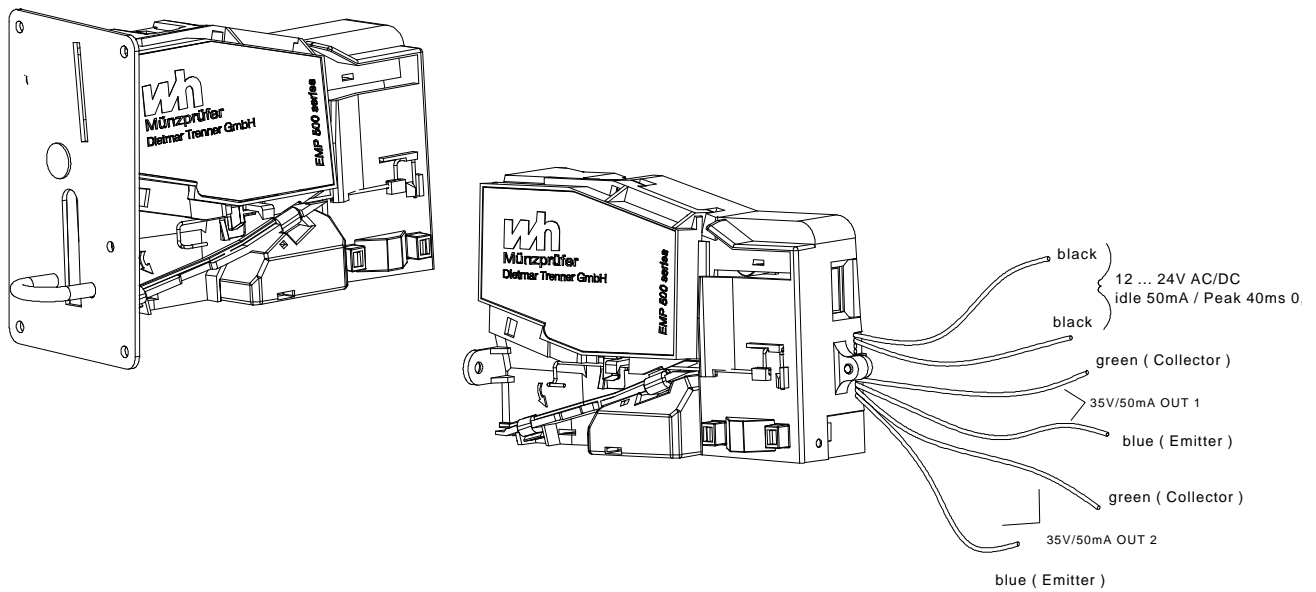Figure 15   Connecting diagram EMP 500.14 v4

Figure 16:　　Dimensions of EMP 500 on F70.5 Frontplate

7.   Applications

Example 1: Dryer

present application: mechanical coin selector with optical switch, z.B. model:
F70-W2005-i4 for 25 Canadian Cent (0.25 CAD)

future application: electronic coin selector, e.g. model: EMP 500.04 /E/T with
front plate F70.5 for the acceptance of US and Canadian Dollars as well as two
tokens for on-site programming.

black
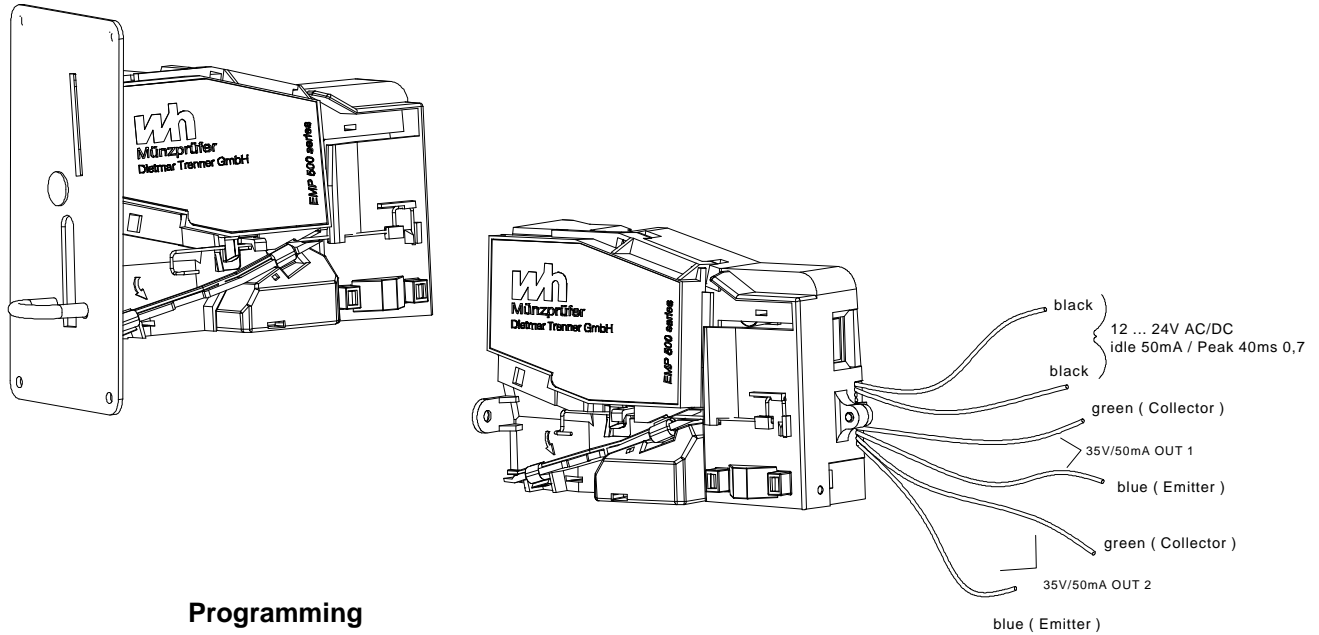black
} 12 ... 24V AC/DC
idle 50mA / Peak 40ms 0.

green (Collector)
35V/50mA OUT 1
blue (Emitter)

green (Collector)
35V/50mA OUT 2
blue (Emitter)

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 500.04 /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.

black
12 ... 24V AC/DC
idle 50mA / Peak 40ms 0,7
black

green (Collector)
35V/50mA OUT 1
blue (Emitter)

green (Collector)
35V/50mA OUT 2
blue (Emitter)

Programming

pulse length: 50 ms pulse pause: 100 ms

coins	blocking switch no.					
	wide	mid	narrow	number of pulses	output line	notes
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