Technical Documentation
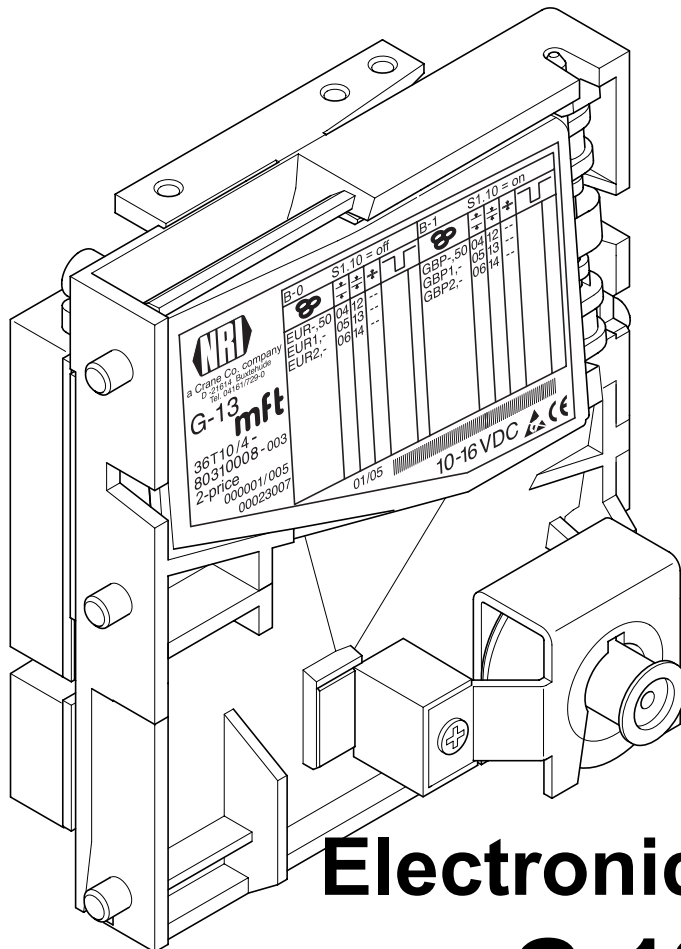
Electronic Coin Validator
G-13.mft parallel

2-price totalizer, timer and TV totalizer mode (from model /4 upwards)

Operating instructions

RoHS
✓

Table of contents

1   General information

This chapter should provide a general overview of the advantages and options regarding the G-13.mft totalizer. The first section, however, is designed to help you navigate easily within these operating instructions.

General information about these instructions

These operating instructions describe the design and operation of the electronic coin validator G-13.mft with a parallel interface in the 1-/2-price totalizer, timer and TV totalizer mode. Chapters 4 und 5 explain the necessary steps for starting up and operating the coin validator. Chapter 6 explains how to clean the coin validator and remedy the cause of a malfunction.

Chap. 8 "Technical data" and the appended index and glossary reduce the search for specific explanations.

Text conventions

To make it easier for you to navigate within these instructions and to operate the device, the following accentuations were made in the text:

Safety instructions, which you must observe in order to protect operators and equipment.

Special notes, which are to facilitate the use of the coin validator.

1 2 3 …   Requests to perform an action are numbered in another typeface.
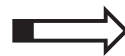
At the beginning of a chapter you will find a short "guide", which summarizes the contents of the chapter.

WinEMP   Device functions, which are set or prepared by the manufacturer according to customer specifications and can be set or changed using the NRI PC programming station (see Chap. 7 "The PC programming station WinEMP" and product accessory pages on the internet (www.nri24.com).

Additional technical documentation

Apart from the operating instructions you already have, the following documentations are available for the G-13.mft totalizer:

- WinEMP – The configuration and diagnostics program for NRI coin validators, operating instructions for the G-13.mft
- Tester G-19.0645 (5-digit)/G-19.0567 (4-digit) for G-13 totalizer
- Electronic coin validator G-13.mft mounting dimensions

If this documentation is not available to you, you can download it at any time from the NRI homepage (www.nri24.com) in the compressed PDF format.

General information about the coin validator

The electronic coin validator G-13.mft (multi-frequency technology) in the standardized 3 1/2" format is based on the tried and tested features of the G-13.6000. Due to its modular and compact design, the G-13.mft is ideally suited for amusement, vending and service machines.

The **multi-frequency technology** is new in the G-13.mft. It provides more flexibility for the measuring sensors, multiple scanning of the coins inserted for optimum material recognition and evaluation of 24 measuring parameters for reliable acceptance of genuine coins and separating out of false coins. Thanks to the coin validator's **flash technology**, software downloads to adapt the measuring technology, coin data and control software can be executed quickly and simply. The G-13.mft has 32 coin channels that can be data-managed, starting from device model /4 and higher, either in a single memory block or, when divided in 2 x 16 coin channels, in two memory blocks with different coin configurations.

In addition to the coin-validating function, the totalizer model of the G-13.mft also data-manages the value of the inserted coins and adds up the generated credit up to a settable comparative value (up to two prices). As soon as the credit reaches the price, the totalizer triggers the sale of a product (according to the operating mode, e.g., beverages, sunbed operation, pinball or video games.

To be able to react as quickly as possible to new false coins and to enable you to make your individual adjustments, this coin validator can be connected to a PC programming station, which consists of the configuration and diagnostics software "WinEMP" (including card reader and licence chip card) and an NRI tester for power supply of the G-13 (cp. also product accessory pages on the internet (www.nri24.com).

Coins that have not been taken into consideration at the manufacturer's company can be programmed in the teach mode directly at the coin validator by inserting coins and without configuration software.

Models and operating modes

The G-13.mft totalizer is available as a top entry or front entry model. The G-13.mft with front entry generally has either a MIDI front plate or a MINI front plate fitted to the left-hand side of the device (see Chap. 3 "Design"). The device is, however, also available as a front entry model without front plate.

The device is set by the manufacturer according to customer specifications to one of the three following operating modes:

- 1-price or 2-price totalizer for setting one or two prices for up to two products (e.g. ice cream, beverages)
- timer for setting a price for a service over a certain period (e.g. sunbed)
- TV totalizer for setting the price of a service (e.g. pinball machine, video games)

WinEMP Changing the totalizer operating mode

For the Italian market, the G-13.mft is also available with another pin assignment of the machine interface (ECV totalizer) (see section "Interfaces (pin assignment and connection diagrams)" in Chap. 8 "Technical data").

2   Safety instructions

Before operating the device for the first time, please read these operating instructions carefully at least once, and most importantly the safety instructions. This is to ensure you have understood the contents of this manual as well as how to operate the coin validator.

Proper use

The coin validators of the G-13.mft series as totalizer models are intended to be used in amusement, goods and services machines with a parallel interface and are supposed to check the coins inserted into the machine for specific properties as well as trigger a vending operation as soon as the inserted credit reaches the set price.

These coin validators have been constructed in compliance with the state of the art and recognized safety regulations. Nevertheless this equipment can be a source of danger. Therefore please observe the following safety regulations.

Protecting yourself and equipment

The coin validator may only be connected by a qualified electrician.

Only use the coin validator according to proper use. Under no circumstances can the manufacturer be held liable for any damage or loss resulting from improper use of the device.

The coin validator PCB is fitted with components that can be damaged by electrostatic discharge. Please observe the handling instructions for components exposed to the risk of electrostatic discharge.

Pull out the machine's mains plug before you install, clean or remove the coin validator.

Select the correct voltage for the coin validator (see label).

Ensure the correct potential equalization in the machine.

Never pull the connecting cable of the coin validator from the machine when a voltage is applied.

Contact NRI if you wish to alter the construction of the device to a greater extent than that described in these instructions.

Keep water and other liquids away from the coin validator.

If the device is no longer required, please dispose of it correctly.

We reserve the right to make technical modifications to the device which are not covered by these instructions.

3 Design

This chapter describes
- the main parts the G-13.mft consists of
- the coin route from insert funnel to cash-box/sorting chute or return area
- all parts which you need to operate the coin validator
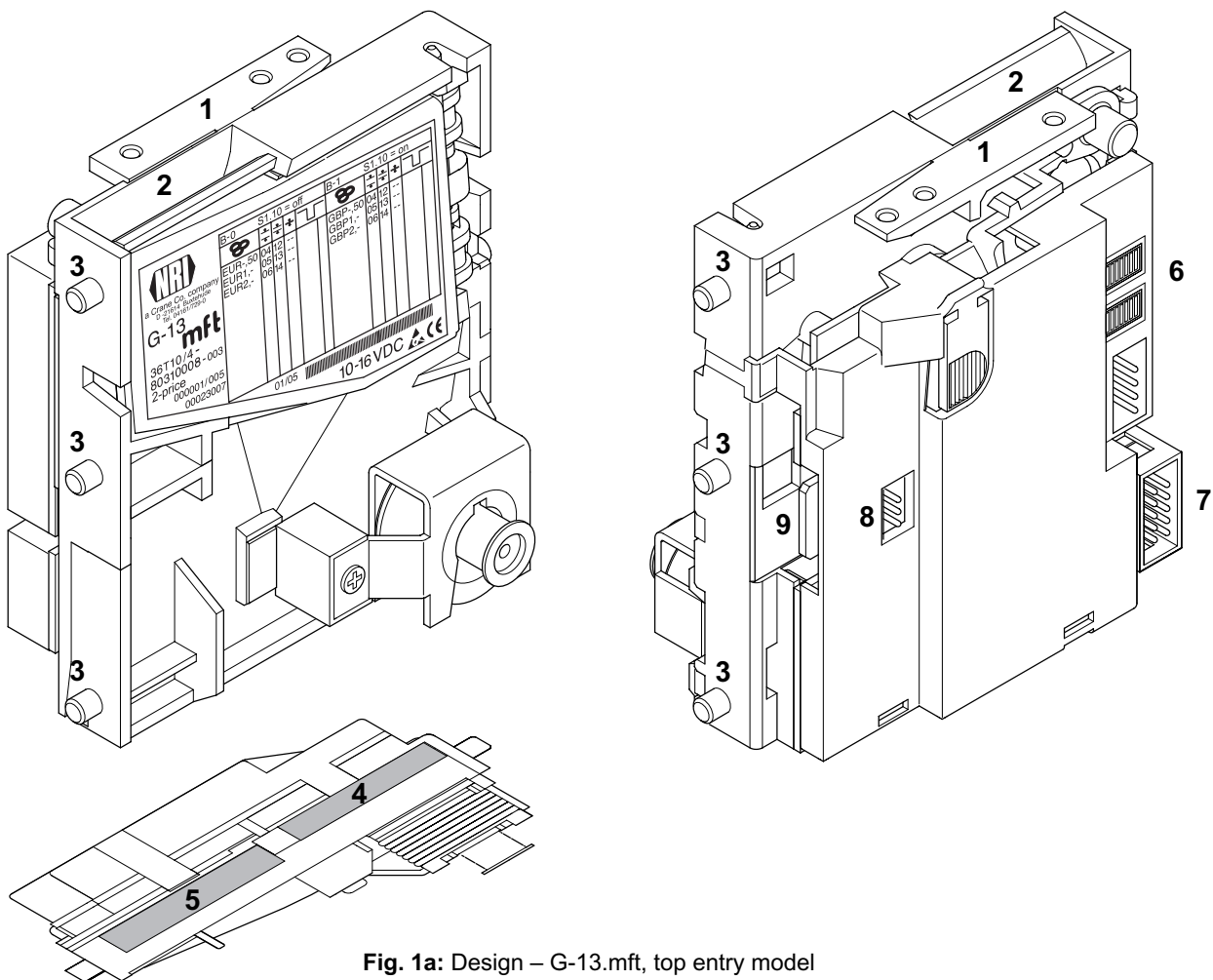
Fig. 1a: Design – G-13.mft, top entry model

1 Return lever
2 Coin insert funnel
3 Mounting studs
4 Coin outlet – return area
5 Coin outlet – cash-box

6 Switching blocks
7 Interface – machine/tester
8 Interface – external sorting device
9 Interface – PC programming station (WinEMP)

Fig. 1b: Design – G-13.mft, front entry model with front plate

1 Return button   **6** Switching blocks
2 Coin insert funnel   **7** Interface – machine/tester
3 Mounting studs   **8** Interface – external sorting device
4 Coin outlet – cash-box   **9** Interface –
5 Coin outlet – return area   PC programming station (WinEMP)

The coin route from insert funnel to cash-box/sorting chute or return area

return area

cash-box/ sorting device
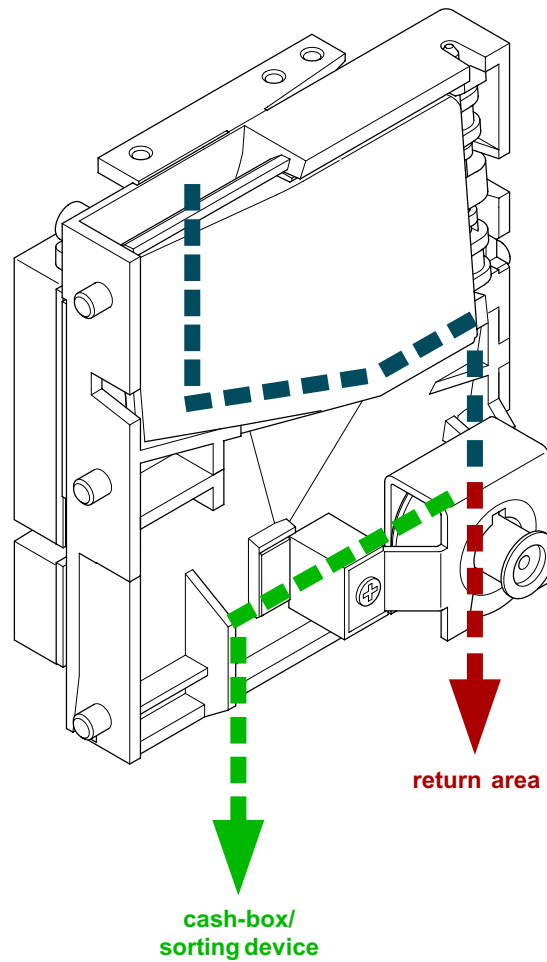
Fig. 2: Coin acceptance and rejection path

Switching blocks

On the rear, the coin validator is equipped with two switching blocks (**6**, Fig. 1) with ten DIL switches S1.1–10 and S2.1–10 each.
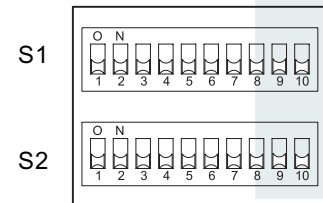
Depending on the totalizer variant, the DIL switches are assigned to different functions, e.g., set the price(s), set the timer time, inhibit coin channels. For details on how to use the switching blocks to set the individual functions, see Chap. 4 "Function and operation".

On the rear of the device you will find a brief description of the individual switch functions.

Return lever and return button

The return lever (**1**, Fig. 1a) on the top of the coin validator is operated using the return button on the machine, if the coins which have already been inserted are to be returned or a jam caused by coins, e.g., which have become stuck needs to be removed. Operating the return lever opens the measurement and validation area of the coin validator so that all objects in the coin validator are transported into the return area.

Devices with front entry through a front plate do not have a return lever. Here the measurement and validation area is opened by pressing the return button (**1**, Fig. 1b) on the front plate.

Label

The label of the coin validator contains all the data defining the device such as device series, device type and device operation as well as customer-specific default values such as coin type or smallest coin value:

Fig. 3: Label

1 Coin information – memory block 0 (if DIL switch S1.10 on OFF)

2 Currency and coin type – memory block 0

3 Channel number, normal coin channel – memory block 0

4 Channel number, narrow coin channel – memory block 0

5 Channel number, very narrow coin channel – memory block 0

6 With totalizer model, no function

7 Coin information – memory block 1 (if DIL switch S1.10 on ON)

8 Nominal voltage

9 Bar code

10 Date of manufacture

11 Consecutive device number per order number

12 Ordering code

13 Order number

14 Totalizer model (standard/ECV totalizer) totalizer operating mode (1-/2-price totalizer/timer/TV totalizer)

15 Data block number and revision number

16 Device type

XX**T** = **standard totalizer**

X = 6 = top entry model
X = 7 = front entry model with MIDI front plate
X = 8 = front entry model with MINI front plate
X = 9 = front entry model without front plate

X = 2 = timer
X = 3 = 1-/2-price totalizer
X = 4 = TV totalizer

XX**V** = **ECV totalizer** (with other pin assignment, see section "Interfaces (pin assignment and connection diagrams)" in Chap. 8 "Technical data")

X = 6 = top entry model
X = 7 = front entry model with MIDI front plate
X = 8 = front entry model with MINI front plate
X = 9 = front entry model without front plate

X = 2 = timer
X = 3 = 1-/2-price totalizer
X = 4 = TV totalizer

4   Function and operation

This chapter describes the functional principle and operation, i.e. the setting of specific functions of the totalizer:

- Coin acceptance and coin channels
- Single or double block data-management
- Accepted coin sensors
- Function and operation of the 1-/2-price totalizer
- Function and operation of the timer
- Function and operation of the TV totalizer
- Select memory block
- Inhibit coin types
- Teach mode
- Connection of a display
- Control for external sorting device
- Battery/low-power applications (option)
- High-Voltage up to 42 V (option)

The settings that are performed directly on the totalizer are described. To find out how to perform settings using the PC programming station WinEMP, please refer to the separate instructions (cp. also Chap. 7 "The PC programming station WinEMP" and product accessory pages on the internet (www.nri24.com).

Coin acceptance and coin channels

For the purpose of coin acceptance, the totalizer possesses 32 "memory slots" that can be assigned up to 32 different coin types or tokens. These "memory slots" are termed coin channels. The acceptance band of a coin type/token is allocated to a coin channel and the coin type/token is accepted in that channel.

To be able to reject false coins reliably, channels with a narrow or even a very narrow acceptance band are frequently set up for a coin type, in addition to the normal coin channel (see section "Label" in Chap. 3 "Design"). The limit values of these coin channels are closer to one another so that false coins with similar measured values are rejected, if the normal coin channel is inhibited (see section "Inhibit coins/activate narrow coin channel" in this chapter). Narrow and very narrow coin channels, however, also possess a lower acceptance rate.

In addition, it is possible to allocate coins with different measured values but identical coin values to different coin channels. This is how the totalizer can, for example, accept old and new coins of the same type.

However, a coin channel is not only assigned the acceptance band of a coin type but also other coin information which defines further processing of the coin after its acceptance: e.g. coin value, discount information or sorting information for an external sorting device.

WinEMP

Since in most cases the manufacturer's customer-specific programming does not take up all the coin channels, channels which are still vacant can be assigned coin types and the desired further information at any time using the configuration software. Existing configurations can be changed.

The last eight coin channels 25 to 32 (or 9 to 16 with double block data-management, see section "Single or double block data-management" in this chapter) are intended to be used for the teach mode. In these coin channels new coin types can also be taught without configuration software, directly on the totalizer using the switching blocks; i.e. a coin channel is assigned a coin type or also a token (see section "Teach mode" in this chapter).

Single or double block data-management

At the manufacturer's company, a customer-specific setting is programmed to determine whether the 32 coin channels of the totalizer are to be data-managed in one memory block or, when divided into 16 channels each, in two memory blocks (double block data-management).

If the double block data-management has been configured, the G-13.mft can data-manage two separately programmed (memory) blocks 0 and 1 (see label). The 16 coin channels can be assigned to each block with different coin types (also currencies), sorting information, etc. Only one block can be active at a time and be used for the coin measurement and for further coin processing. You can use the upper switching block on the device to select the desired block (see section "Select memory block" in this chapter).

Accepted coin sensors

To ensure that accepted coins actually arrive in the cash-box or in an external sorting device and that coin acceptance has not been tampered with, accepted coin sensors located in front of the cash-box coin outlet check whether the inserted coin drops unhindered into the cash-box chute. A signal is not transmitted to the machine until the coin has passed this checking function.

If the accepted coin sensors are continuously covered, e.g. by a coin jam, coin acceptance is inhibited.

Function and operation of the 1-/2-price totalizer

This section describes the functions and their adjustment, which characterize the 1-/2-price totalizer operation:

- Vending sequence
- Set the prices
- Data-manage the residual credit
- Free vend
- Deactivate price
- Tokens

Vending sequence

Since the vending sequence of the 1-price totalizer differs from the one of the 2-price totalizer, the vending sequence will be described in two separate sections.

1-price totalizer

On the totalizer, the value of an accepted coin is added to the customer's current credit in each case.

When the price is reached or exceeded, price line 1 is activated. After completion of the handing-out of goods, the machine informs the totalizer via the reset line that the customer's credit must either be reduced by the amount of the price (multi vend) or be reset (single vend). If "single vend" has been configured, no further coins are accepted when the price is reached (see also section "Data-managing the residual credit").

2-price totalizer

On the totalizer, the value of an accepted coin is added to the customer's current credit in each case.

When the first or second price is reached or exceeded, price line 1 or 2 is activated respectively. If both price lines are active, i.e. the higher price has also be reached or exceeded, no further coins will be accepted. After completion of the handing-out of goods, the machine informs the totalizer via the reset line that the customer's credit must be reset, which means that any residual credit will be lost.

Set the price(s)

On the G-13.mft totalizer, one or two prices can be set as binary values using the switching blocks:

Price setting for 1-price totalizer
S1.1...S1.8

S1

S2
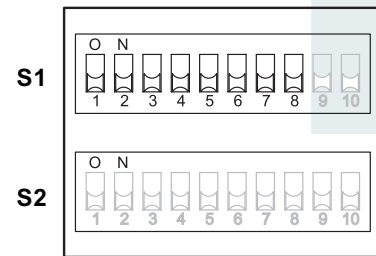
Price setting for 2-price totalizer
S1.1...S1.8 for price 1

S1
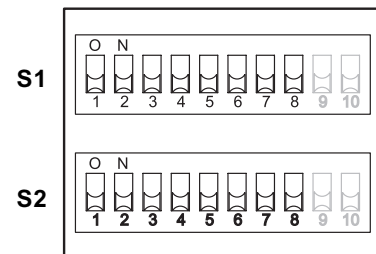
S2.1...S2.8 for price 2

S2

The price is set in binary form as a multiple of the smallest programmed coin.

The smallest programmed coin value is listed with all other coin values on the label.

WinEMP

Changing the smallest coin value

Example
The totalizer is to be set to a price of 1.00 Euro, and the smallest coin value is 0.05 Euro. A binary value of 20 must therefore be set using the DIL switches (20 x 0.05 EUR = 1.00 EUR).

Valency	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**

O N
1 2 3 4 5 6 7 8 9 10
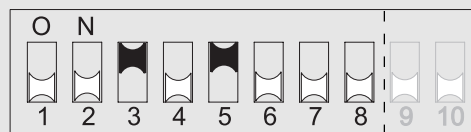
Price (Euro) = (16 + 4) x 0.05 = 20 x 0.05 = **1.00**

To set a price of 1.00 Euro, the DIL switches 3 and 5 of the upper or lower switching block must be set upward to ON!

Data-manage the residual credit (only 1-price totalizer)

If, for a vending operation, an amount of money is inserted into the device that is greater than the set price, the customer's residual credit can be data-managed in a number of ways:

- Reset residual credit immediately (single vend)
  Residual credit is reset immediately after the vending operation
- Retain residual credit (multiple vend)
  Residual credit can be used for another vend or another customer
- Retain residual credit for two minutes (time-dependent multi vend)
  Residual credit is reset two minutes after the vending operation

If two prices have been set on a totalizer and if a multi vend option has been selected, the second price that has been set will not be taken into account.

WinEMP Changing the residual credit data-management

Free vend

For free vending operations, all price switches must be set downward (to OFF) (see section "Set the price(s)"). In that case, the respective price line is constantly active.

Deactivate price

To deactivate the second price for the 1-price totalizer operation, all price switches of the lower switching block must be set upward to ON (see section "Set the price(s)").

Tokens

Each coin channel can also be assigned a token instead of a coin; this token is assigned an arbitrary value or the value of a price (one product for one token). Following the acceptance of a token, the customer's credit increases by the set price.

The 2-price totalizer makes a distinction between a second token for the second product.

WinEMP Several tokens can be configured.

Function and operation of the timer

This section describes the functions and their adjustment, which characterize the timer operation:

- Vending sequence
- Set the price
- Set the timer time
- Data-manage the residual credit
- Extend the elapsing time by coin insertion
- Reset line
- Activate service using start button (on-request mode)
- Tokens
- Inventory function
- Warning signal before time lapse
- Display indication

Vending sequence

On the timer, the value of an accepted coin is added to the customer's current credit in each case.

When the price is reached or exceeded, price line 1 is activated for the duration of the set timer time. The elapsing time is now shown on the machine display. Coin acceptance is not inhibited during timer operation. This means that the customer can extend an already running period of time by inserting further coins.

If the credit cannot be precisely converted into time, the accruing residual credit can be data-managed in a number of ways (see section "Data-manage the residual credit").

Set the price

On the G-13.mft timer, the price is set as a binary value using the upper switching block:
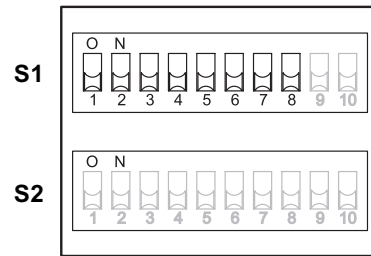
S1.1...S1.8

The price is set in binary form as a multiple of the smallest programmed coin.

☞ *The smallest programmed coin value is listed with all other coin values on the label.*

WinEMP 🔧 Changing the smallest coin value

Example
The timer is to be set to a price of 1.00 Euro, and the smallest coin value is 0.05 Euro. A binary value of 20 must therefore be set using the DIL switches (20 x 0.05 EUR = 1.00 EUR).

Valency	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**
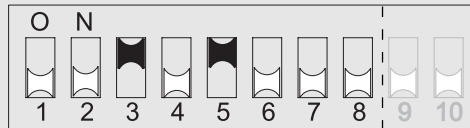
Price (Euro) = (16 + 4) x 0.05 = 20 x 0.05 = **1.00**

To set a price of 1.00 Euro, the DIL switches 3 and 5 of the upper switching block must be set upward to ON!

Set the timer time

The timer sells a service over a specific period of time. You can set the time available to a customer for the credit of the set price as a binary value using the lower switching block S2:

S1

S2.1...S2.8, S2.10

S2
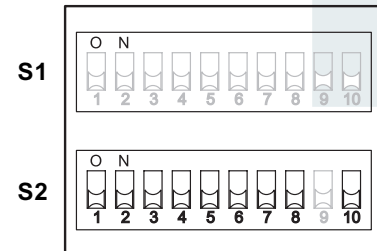
DIL switch S2.10 defines the unit of time (seconds (ON) or minutes (OFF)).

Example – time unit "minutes"
The timer is to be set to a time of 15 min. A valency of 15 must therefore be set using the DIL switches.

Valency   **1   2   4   8   16   32   64 128**

Time = 8 + 4 + 2 + 1 = **15**

To set a timer time of 15 min., the DIL switches 1 to 4 of the lower switching block S2 must be set upward to ON and DIL switch 10 downward (to OFF)!

Example – time unit "seconds"
The timer is to be set to a time of 200 sec. A valency of 200 must therefore be set using the DIL switches.

Valency   **1   2   4   8   16   32   64 128**

Time = 128 +64 +8 = **200**

To set a timer time of 200 sec., the DIL switches 4, 7, 8 and 10 of the lower switching block S2 must be set upward to ON!

Data-manage the residual credit

If the credit cannot be precisely converted into time, the accruing residual credit can be data-managed in a number of ways:

- Reset residual credit immediately
  Residual credit is reset after the time has elapsed
- Retain residual credit
  Residual credit can be used for another vend or another customer
- Retain residual credit for two minutes

WinEMP   Changing the residual credit data-management

Extend the elapsing time by coin insertion

WinEMP   If the customer is <u>not</u> supposed to be able to extend an already elapsing time by the insertion of further coins, this restriction can be set using the configuration software. The timer will not accept coins again until the time has elapsed.

Reset line

The activation of the reset line will interrupt the elapsing of the time. The price line remains activated.

Activate service using start button (on-request mode)

If the time for a service is not supposed to elapse immediately after the price has been reached, the customer can activate the vending operation using the start button so that the timer transmits the signal to the machine only upon individual request.

For the on-request mode, the combined reset/request signal line must be connected to a start button (see section "Interfaces (pin assignment and connection diagrams)" in Chap. 8 "Technical data").

WinEMP   Activate/deactivate on-request mode

Tokens

Each coin channel can also be assigned a token instead of a coin; this token is not assigned an arbitrary value but the value of the price (one service/timer time for one token). Following the acceptance of a token, the customer's credit therefore increases by the set price.

WinEMP   Several tokens can be configured.

Inventory function

If the inventory function has been activated, the timer transmits inventory pulses for every coin inserted via the 2nd price line (in this case: inventory signal line). The pulse number per coin equals the multiple of the smallest coin value set for this coin.

The inventory pulses can be added up using an external counter and serve the purpose of verifying the cash-box contents.

WinEMP   Activate/deactivate inventory function

The inventory function and the output of a warning signal can only be used alternatively und not combined, as the signals are transmitted using the same line (see section "Warning signal before time lapse" in this chapter).

Warning signal before time lapse

At the manufacturer the timer can be set so that it sends a warning signal via the second price line (here: warning signal line), before the timer time purchased has elapsed. Thus the customer's attention is drawn to the fact that he has to insert further coins, if the time is to be run on.

The purchased time determines when the warning signal is transmitted:

Timer purchased	Signal ... **before time has elapsed**
– 59 sec.	no signal
1 min. – 9 min. 59 sec.	30 sec.
10 min. – 59 min. 59 sec.	1 min.
1 h –	10 min.

WinEMP   Activate/deactivate warning signal output

The output of a warning signal and the inventory function can only be used alternatively and not combined, as the signals are transmitted using the same line (see section "Warning signal before time lapse" in this chapter).

Display indication

The machine display shows the customer's credit until it reaches the set price. If the price is reached or exceeded, the elapsing time will be displayed.

Example

Price = EUR 3 for a timer time of 8 min.

Credit (in EUR)	Timer time	Display indication
up to 3.00	–	2.90 (e.g.)
3.00	8 min.	8
4.50	12 min.	12

As long as the (right) decimal point flashes, the time is elapsing. Otherwise, the timer time has been stopped (e.g. in the on-request mode or via the reset line)

The time is displayed in seconds or minutes according to the unit of time that has been set (DIL switch S2.10).

Display format: Standard / 1/60

Example

Timer time = 90 min./sec.

S2.10	Standard format	1/60 format
OFF (min.)	90	1h30
ON (sec.)	90	1–30

Function and operation of the TV totalizer

This section describes the functions and their adjustment, which characterize the TV totalizer operation:

- Vending sequence
- Set the price
- Set the pulse pause time
- Data-manage the residual credit
- Bonus coins and bonus levels
- Activate service using start button (on-request mode)
- Timed output mode
- Tokens
- Inventory function

Vending sequence

On the TV totalizer, the value of an accepted coin is added to the customer's current credit in each case.

If the set price for a game is reached or exceeded, an pulse is sent to the machine via price line 1, thereby triggering the handout routine (see also section "Activate the service using start button (on-request mode)"). Additional coins can be inserted.

If the credit cannot be precisely divided by the price for a game, the residual credit can be data-managed in a number of ways (see section "Data-manage the residual credit").
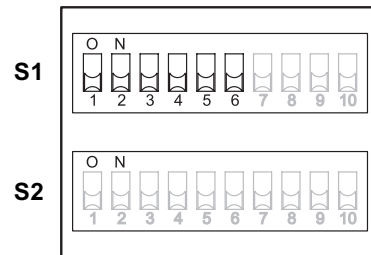
Display indication

The machine display shows the credit briefly, while the pulses are transmitted (at least 500 ms). Afterwards, the display jumps back to zero or shows a residual credit.

Set the price

On the G-13.mft TV totalizer, the price is set as a binary value using the upper switching block:

S1.1...S1.8

The price is set in binary form as a multiple of the smallest programmed coin.

The smallest programmed coin value is listed with all other coin values on the label.

WinEMP   Changing the smallest coin value

Example
The TV totalizer is to be set to a price of 1.00 Euro, and the smallest coin value is 0.05 Euro. A binary value of 20 must therefore be set using the DIL switches (20 x 0.05 EUR = 1.00 EUR).

Valency   **1   2   4   8   16   32**
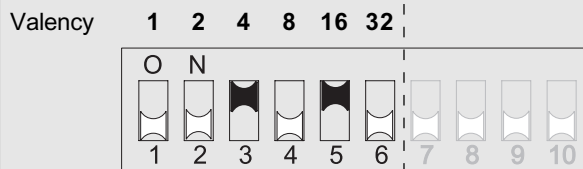
Price (Euro) = (16 + 4) x 0.05 = 20 x 0.05 = **1.00**

To set a price of 1.00 Euro, the DIL switches 3 and 5 of the upper switching block must be set upward to ON!

Set the pulse pause time

To set the G-13.mft in the TV totalizer operation to the specific processing times of the machine, the DIL switches 7 and 8 of the upper switching block S1 can be used to set four different pulse pause times:

Pulse/pause

20/80 ms	**S1**	
50/200 ms	**S1**	
100/400 ms	**S1**	
200/800 ms	**S1**	

Data-manage the residual credit

If, for a sales transaction, an amount of money is inserted in the device which is greater than the set price, the customer's residual credit can be data-managed in a number of ways:

- Reset residual credit immediately
  Residual credit is reset immediately following pulse output
- Retain residual credit
  Residual credit can be used for another vend or another customer
- Retain residual credit for two minutes
  Residual credit is reset two minutes after the vending operation

WinEMP   Changing the residual credit data-management

Discounts

For the TV totalizer operation, you can either grant a discount for specific coin types or grant a discount starting from a specific credit.

WinEMP

Whether you want to set bonus coins or bonus levels is programmed by the manufacturer according to customer specifications. If this selection could not be made when the order was placed, the bonus option "bonus coin" was programmed.

Bonus coins

If a discount is to be granted on certain coin types (e.g. high-value coins) or tokens, these coin types can be configured as so-called bonus coins. These bonus coins are not provided with the actual coin value but with the value of a price or a multiple of the price.

Up to two different bonus coins A and B are available.

WinEMP

Which coins are to be evaluated as bonus coins A and B?
Standard setting:
highest programmed coin = bonus coin A, second highest programmed coin = bonus coin B

How many games the customer receives by inserting a bonus coin (max. 15) is something you can set as a binary value using the first eight DIL switches of the memory block S2.
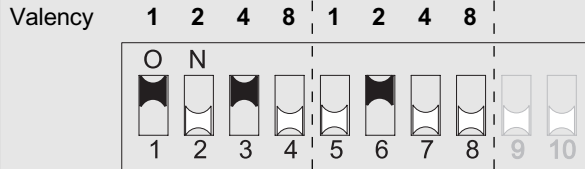
S2.1...S2.4 for bonus coin A

S2.5...S2.8 for bonus coin B
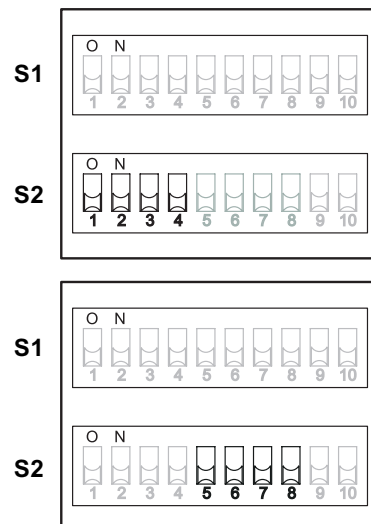
Example

The TV totalizer is supposed to grant 5 games for bonus coin A and 2 games for bonus coin B. A valency of 5 must therefore be set using DIL switches S2.1–4, and a valency of 2 must be set using DIL switches S2.5–8.

Games for bonus coin A = 4 + 1 = **5**
Games for bonus coin B = **2**

To grant the customer 5 games for bonus coin A and 2 games for bonus coin B, the DIL switches 1, 3 and 6 of the lower switching block S2 must be set upward to ON!

If the DIL switches 1–4 or 5–8 of the lower switching block S2 have been set downward (on OFF), the customer does not receive a discount on the bonus coin.

Bonus levels

If you do not want to restrict the customer to a specific coin for a discount, you can configure up to two bonus levels A and B to the amount of two specific credits. If the current credit reaches or exceeds a bonus level, the customer is granted a discount by means of an additional game.

You can set the credit for bonus level A and B as a binary value using the first eight DIL switches of the memory block S2.

S2.1...S2.4 for bonus level A

S2.5...S2.8 for bonus level B
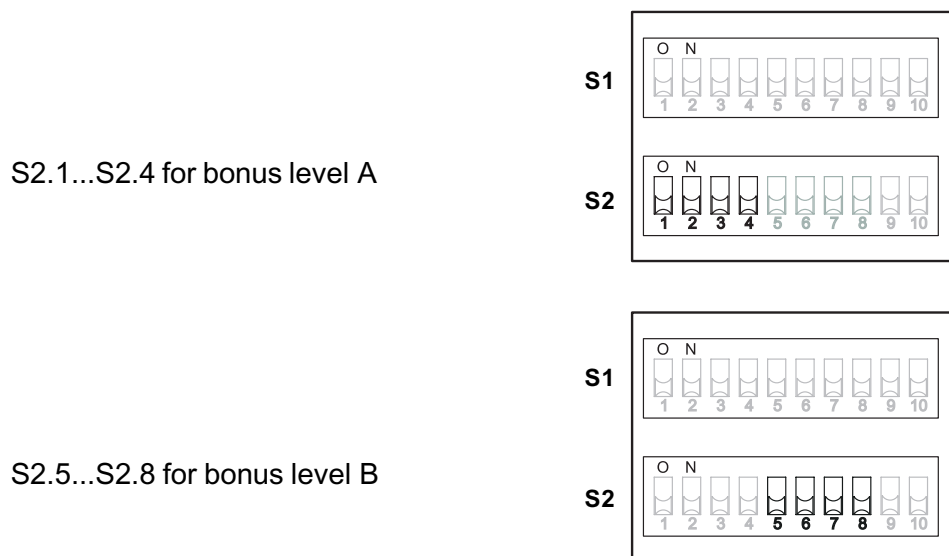
Bonus levels A and B are set in binary form as a multiple of the set price.

Example

On the TV totalizer, a bonus level A of EUR 1.00 and a bonus level B of EUR 2.00 are to be set, and the price for a game is 0.50 Euro. A valency of 2 must therefore be set using DIL switches S2.1–4 and a valency of 4 must be set using DIL switches S2.5–8.

Valency   **1   2   4   8   1   2   4   8**

Bonus level A (in EUR) = 2 x 0.50 = **1.00**
Bonus level B (in EUR) = 4 x 0.50 = **2.00**

To set the bonus levels of EUR 1.00 and 2.00, the DIL switches 2 and 7 of the lower switching block S2 must be set upward to ON!

Credit	Game number without bonus levels	Game number with bonus levels
EUR 1.00	2	3
EUR 2.00	4	7
EUR 4.00	8	14

Each time a bonus level is reached, an additional signal is transmitted to the machine, which means that an additional game is granted. If a bonus level is reached several times, the discount will also be granted several times (for a credit of EUR 4.00, the first bonus lvel is reached 4 times and the second bonus level 3 times, which means that six additional games are added to the eight actual games).

The basic requirement is that there are no more than ten seconds between the coin insertions.

In the on-request mode, discounts are granted until the start button for activating the first game is pressed, even if there are more than ten seconds between the coin insertions (see also section "Activate service using start button (on-request mode)").

Display indication

The machine display shows the customer's credit as long as the customer can reach bonus levels by inserting further coins. After ten seconds, the display jumps back to zero or shows a residual credit.

Activate service using start button (on-request mode)

If the signal for a game is not to be transmitted to the machine immediately after the price has been reached, the customer can use a start button to activate each individual game until his credit has been used up. In that case, the machine display shows the credit first, and then, as soon as the credit reaches or exceeds the price of a game, the number of games that can be started with that credit.

For the on-request mode, the combined reset/request signal line must be connected to a start button (see section "Interfaces (pin assignment and connection diagrams)" in Chap. 8 "Technical data").

WinEMP   Activate/deactivate on-request mode

Display indication

The machine display shows the credit until it reaches the price for a game. Afterwards, the number of purchased games are shown (incl. bonus games). Whenever the customer uses the start button to activate a game, the indication is reduced by one game. If no further game can be started, the display jumps back to zero or shows a residual credit.

Example		
Price = EUR 1 for one game		
Credit (in EUR)	Number of games	Display indication
up to 1.00 –	0.50 (z. B.)	
1.00	1	1
5,50	5	5 → 4 → 3 → 2 → 1 → 0.50

Timed output mode

If a game is not to be activated via a short signal but rather via a constant signal, you can, in the timed output mode, use the lower switching block to set a period of time for a game (see section "Set the timer time").

The machine display then shows the elapsing time for a game. After the time has elapsed, either the number of games still available with the credit are shown or the residual credit is shown (see also section "Data-manage the residual credit").

WinEMP   Activate/deactivate timed output mode

If the timed output mode is active, the lower switching block can no longer be used to set discounts (cp. also section "Discounts").

Display indication

The machine display shows the credit until it reaches the price for a game. Afterwards, the number of purchased games are shown (incl. bonus games). Whenever the customer uses the start button to activate a game, the elapsing time is shown first, and then the indication is reduced by one game. If no further game can be started, the display jumps back to zero or shows a residual credit.

Example
Price = EUR 1 for one game of 60 sec. each

Credit (in EUR)	Number of games	Display indication
up to 1.00	–	0.50 (e.g.)
1,00	1 x 60 sec.	1 → Start button → 0-60 → 0-01 → 0.00
5,50	5 x 60 sec.	5 → Start button → 0-60 → 0-01 → 4 → Start button → 0-60 → 0-01 → 3 → Start button → 0-60 → 0-01 → 2 → Start button → 0-60 → 0-01 → 1 → Start button → 0-60 → 0-01 → 0.50

Tokens

Each coin channel can also be assigned a token instead of a coin; this token is not assigned an arbitrary value but the value of the price (one game for one token). Following the acceptance of a token, the customer's credit therefore increases by the set price.

WinEMP   Several tokens can be configured.

Inventory function

If the inventory function has been activated, the TV totalizer transmits inventory pulses for every coin inserted via the 2nd price line (in this case: inventory signal line). The pulse number per coin equals the multiple of the smallest coin value set for this coin.

The inventory pulses can be added up using an external counter and serve the purpose of verifying the cash-box contents.

WinEMP   Activate/deactivate inventory function

Select memory block (only for double block data-management)

If the 32 coin channels, divided in 16 coin channels each, are data-managed in two (memory) blocks (B-0 and B-1, see label), these (memory) blocks are programmed separately from one another by the manufacturer on a customer-specific basis. The data of the two blocks 0 and 1 differ when they are being used in the device, e.g. by the acceptance of different currencies, such as national currency and Euro. Only one block can be active at a time and be used for the coin measurement and for further coin processing.

If the totalizer is to access the other memory block and, e.g., accept Euro coins instead of national currency coins, the correct block can be selected using the upper switching block.

Memory block 0 selected   **Memory block 1 selected**

Set DIL switch S1.10 of the upper switching block downward to OFF to select memory block 0 and upward to ON to select memory block 1.

Inhibit coin types

If coins are no longer to be accepted for payment at the machine, you can either inhibit the entire coin acceptance using the machine control system (common inhibit) or inhibit individual types using the switching blocks on the totalizer.

External common inhibit

The machine can inhibit coin acceptance via the common inhibit signal line. The totalizer no longer accepts coins (see section "Interfaces (pin assignment and connection diagrams)" in Chap. 8 "Technical data").

Internal inhibit of single coin types/coin groups ...

Using the DIL switches on the totalizer, you can inhibit individual coin types or also groups of coins on site.

Depending on whether the 32 coin channels are being data-managed in one or, when divided in 16 coin channels each, in two memory blocks (B-0 and B-1, see label), the coin types are inhibited differently.

WinEMP

Alternatively: deactivate individual coin types on a long-term basis

**... with double block data-management (B-0 and B-1)**

To inhibit the coin channels, the totalizer must be switched from the operating mode into the setting mode first (DIL switch S1.9). Using the two switching blocks, each of the 16 coin channels of the memory block activated or each coin type assigned to a specific coin channel can then be inhibited individually, i.e. this/these coin type(s) is/are not accepted for payment on the machine.

To activate a narrow coin channel the normal coin channel must be inhibited. If both channels are activated, the wider acceptance band of the normal coin channel is used.

The first 8 DIL switches each inhibit the following coin channels:

Switching block S1

DIL switch		off	on
S1.1	Coin channel 1	vacant	inhibited
S1.2	Coin channel 2	vacant	inhibited
S1.3	Coin channel 3	vacant	inhibited
S1.4	Coin channel 4	vacant	inhibited
S1.5	Coin channel 5	vacant	inhibited
S1.6	Coin channel 6	vacant	inhibited
S1.7	Coin channel 7	vacant	inhibited
S1.8	Coin channel 8	vacant	inhibited
S1.9	Mode	Normal	Set inhibit
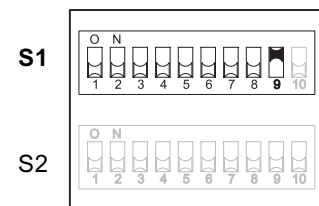
Switching block S2

DIL switch		off	on
S2.1	Coin channel 9	vacant	inhibited
S2.2	Coin channel 10	vacant	inhibited
S2.3	Coin channel 11	vacant	inhibited
S2.4	Coin channel 12	vacant	inhibited
S2.5	Coin channel 13	vacant	inhibited
S2.6	Coin channel 14	vacant	inhibited
S2.7	Coin channel 15	vacant	inhibited
S2.8	Coin channel 16	vacant	inhibited
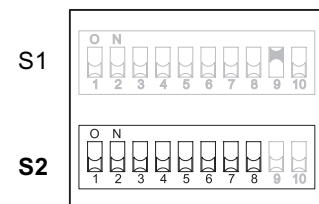
Please refer to the label on the device to see which coin type has been assigned to which coin channel by the manufacturer.

However, this assignment could have been changed using the configuration software.

If all coin types are to be accepted for payment at the machine, the DIL switches S1.1–S1.8 and S2.1–S2.8 of the two switching blocks are in the lower position (on OFF). If you want to inhibit a coin channel, you only need to move the respective DIL switch toward the top to ON.

Example

The totalizer is no longer supposed to accept the coin(s) assigned to coin channels 3 and 10, which means that coin channels 3 and 10 must be inhibited
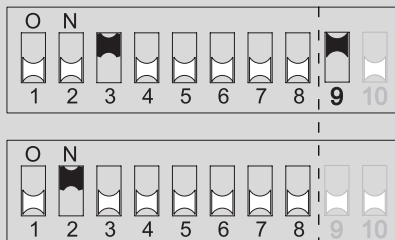
With the DIL switches in these positions, the totalizer no longer accepts the coin type(s) assigned to coin channels 3 and 10!

If a normal coin channel and a narrow coin channel have been programmed on the totalizer for one coin type, the normal coin channel must be inhibited as described above in order to activate the narrow coin channel. If both channels are activated, the wider acceptance band of the normal coin channel is used.
If the coin type is to be inhibited, both coin channels must also be inhibited.

To inhibit coin channels on the totalizer:

Remember the current switch settings so that you can restore them for the normal operating mode at the end.

1 Set DIL switch S1.9 upward to ON.
The totalizer is now in the setting mode.

2 Set DIL switches S1.1–8 and S2.1–8 downward (to OFF).

3 Inhibit the desired coin channels using the DIL switches S1.1–8 and S2.1–8 (cp. example above).

4 Press the return lever or return button (open the flight deck).
The setting was confirmed.

5 Set DIL switch S1.9 downward again (to OFF).
A successful saving operation is signalled with a one-time attraction of the acceptance gate and an error during the saving operation with a two-time attraction of the acceptance gate (brief clacking sound). In the latter case, the operation must be repeated.
The totalizer is in the operating mode again.

**6** Adjust DIL switches S1.1–8 and S2.1–8 again for normal operation.

... with single block data-management

To inhibit the coin channels, the totalizer must be switched from the operating mode into the setting mode first (DIL switch S1.9). Coin channels can then be inhibited using the first eight DIL switches S1.1–S1.8 of the upper switching block. The label shows which coin types are assigned to the DIL switches and can be inhibited. Several coin channels can also be assigned to one switch. This switch will then inhibit a coin group (e.g. all coin channels of a currency, all acceptance bands of a coin type (normal and narrow ones)).

WinEMP

Assignment DIL switch – coin type/coin group

If all coin types assigned to the DIL switches are to be accepted for payment at the machine, the DIL switches must be in the lower position (on OFF).If you want to inhibit a coin channel, you only need to move the respective DIL switch toward the top to ON.

Any coin types or tokens that may have been taught in coin channels 25 to 32 are inhibited using the DIL switches of the lower switching block S2.1–8 (see section "Teach mode" in this chapter).

The following examples are designed to illustrate the procedure using the label. The label shows the manufacturer's assignment of coin type/coin group.

The label shown on the totalizer:

National Rejectors, Inc. GmbH D-21614, Buxtehude Tel. 04161/729-0

a Crane Co. company

G-13 mft

36T10 / 1 -
80310008 - 003
2-price
000001 / 001
00023007

01/05

10-16 VDC

	12345678		12345678
GBP-,05		GBP-,05	
GBP-,10		GBP-,10	
GBP-,20		GBP-,20	
GBP-,50		GBP-,50	
GBP1,-		GBP1,-	
GBP2,-		GBP2,-	
EUR-,05		EUR-,05	
EUR-,10		EUR-,10	
EUR-,20		EUR-,20	
EUR-,50		EUR-,50	
EUR1,-		EUR1,-	
EUR2,-		EUR2,-	
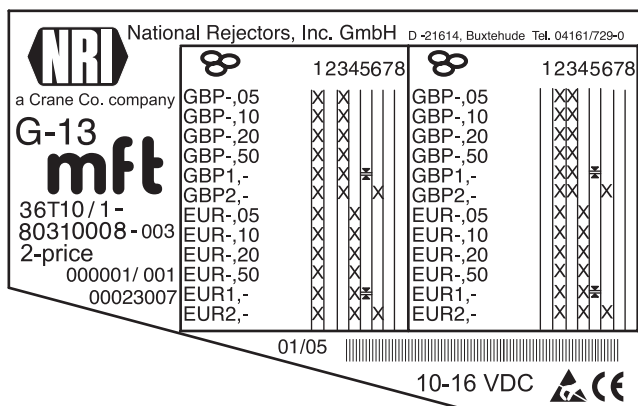
Example – Inhibit a currency as coin group X
The totalizer must only accept Euros and no longer the British currency

With this setting the totalizer only accepts Euros!

Example – Activate narrow acceptance bands/coin channels as coin group ⇞
The totalizer must accept the 1-Euro coin and the British 1-pound coin in the narrow acceptance band and not in the normal one, i.e. it must inhibit the normal acceptance band

With this setting the totalizer accepts coins in the narrow coin channel and not in the normal one!

Example – Inhibit single coin type X
The totalizer must no longer accept the 2-Euro coin or the British 2-pound coin

With this setting the totalizer no longer accepts the 2-Euro coin or the British 2-pound coin!

On a totalizer with the label shown above, the Euro currency could also be inhibited using DIL switch S1.4.

With the aid of several DIL switches more than one coin type or coin group can be inhibited simultaneously.

To inhibit coin channels on the totalizer:

Remember the current switch settings so that you can restore them for the normal operating mode at the end.

1 Set DIL switch S1.9 upward to ON.
The totalizer is now in the setting mode.

2 Set DIL switches S1.1–8 downward (to OFF).

3 Inhibit the desired coin channels using the DIL switches S1.1–8 (cp. example above).

4 Press the return lever or return button (open the flight deck).
The setting was confirmed.

5 Set DIL switch S1.9 downward again (to OFF).
A successful saving operation is signalled with a one-time attraction of the acceptance gate and an error during the saving operation with a two-time attraction of the acceptance gate (brief clacking sound). In the latter case, the operation must be repeated.
The totalizer is in the operating mode again.

6 Adjust DIL switches S1.1–8 again for normal operation.

Teach mode

Coin channels can also be taught directly in the teach mode without configuration software via the lower switching block on the totalizer, i.e. a coin channel is reassigned a coin type or even a token. The new acceptance band is generated by inserting the coins. For this, the totalizer does not need to be removed from the machine. For the teaching procedure, coin channels 9 to 16 of the activated memory block are available with double block data-management and coin channels 25 to 32 with single block data-management (see also section "Single or double block data-management" in this chapter).

You will need at least ten coins of the new type. There is a different switch assignment for the double and single block data-management:

Switch assignment with double block data-management (in the teach mode)

Switching block S2

DIL switch		off		on
S2.1	Coin channel 9	–		teach
S2.2	Coin channel 10	–		teach
S2.3	Coin channel 11	–		teach
S2.4	Coin channel 12	–		teach
S2.5	Coin channel 13	–		teach
S2.6	Coin channel 14	–		teach
S2.7	Coin channel 15	–		teach
S2.8	Coin channel 16	–		teach
S2.9	Teach mode	switch off		switch on
S2.10	Acceptance band	normal		wide
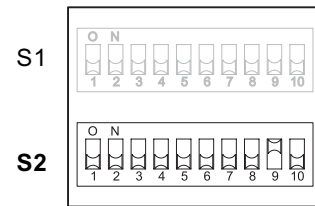
Switch assignment with single block data-management (in the teach mode)

Switching block S2

DIL switch		off		on
S2.1	Coin channel 25	–		teach
S2.2	Coin channel 26	–		teach
S2.3	Coin channel 27	–		teach
S2.4	Coin channel 28	–		teach
S2.5	Coin channel 29	–		teach
S2.6	Coin channel 30	–		teach
S2.7	Coin channel 31	–		teach
S2.8	Coin channel 32	–		teach
S2.9	Teach mode	switch off		switch on
S2.10	Acceptance band	normal		wide
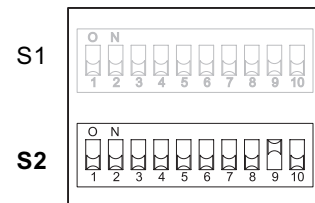
Teach coin channels

To assign a coin type to a new coin channel, please proceed as follows:

Remember the current switch settings so that you can restore them for normal operation at the end.

1 Set all DIL switches S2.1–10 downward to OFF.
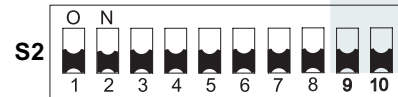
2 Set DIL switch S2.9 toward the top to ON.
Now the device is in teach mode to teach the coin channels.
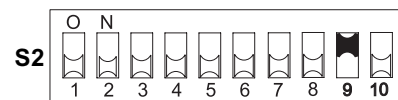
3 Release the coin channel to be taught (9–16 or 25–32, here: 11 or 27) by setting the appropriate DIL switch (S2.1–8, here: S2.3) toward the top to ON.
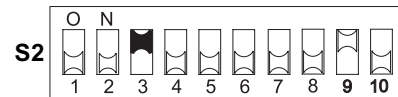
4 Insert at least 10 coins of the new coin type/token into the coin validator or machine.
After the 10th coin has been inserted, the acceptance gate is operated once (brief clacking sound). Additional coins can be inserted.

You must insert at least 11 coins in devices with a wake-up sensor, as the first coin is only used to wake-up the totalizer and is not valued.

Now you can save the measured values generated by the inserted coins in either a normal (a) or a wide (b) acceptance band. A wide acceptance band is only an appropriate choice when you only have a limited selection of coins at your disposal for the purpose of teaching the tokens.

To save with the normal acceptance band:

5a) Set DIL switch S2.9 toward the bottom to OFF.
Successful saving is signalled by the acceptance gate attracting once, an error when saving is indicated by the acceptance gate attracting twice (brief clacking sounds), if, for example, the acceptance band of the coins inserted and an acceptance band of an already programmed coin channel overlap.
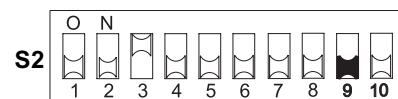
To abort the operation, first set the DIL switch of the respective coin channel (here: S2.3) and then DIL switch S2.9 toward the bottom to OFF.

To save with a wide acceptance band:

b) Set DIL switch S2.10 toward the top to ON.

The acceptance band has been widened.

Now you can set DIL switch S2.9 toward the bottom to OFF.

Successful saving is signalled by the acceptance gate attracting once, an error when saving is indicated by the acceptance gate attracting twice (brief clacking sound), if, for example, the acceptance band of the coins inserted and an acceptance band of an already programmed coin channel overlap.
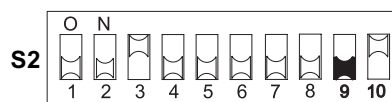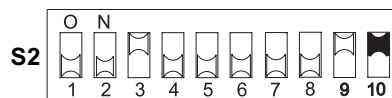
To abort the operation, first set the DIL switch of the respective coin channel (here: S2.3) as well as DIL switch S2.10 and then DIL switch S2.9 toward the bottom to OFF.

6 Adjust DIL switches S2.1–8 and S2.10 again for normal operation.

The new coin type/token will now be accepted for payment by the totalizer.

Connection of a display

The G-13.mft totalizer is designed for the connection of a 4-digit or 5-digit display (e.g. NRI display, see section "Accessories" in Chap. 8 "Technical data"). Following the insertion of coins into the totalizer, and depending on the totalizer operating mode in each case, either the customer's current credit, the time corresponding to the credit or the number of games corresponding to the credit will be indicated on the display (see also section "Function and operation of the 1-/2-price totalizer/timer/TV totalizer" in this chapter).

WinEMP   Select 4-digit or 5-digit display and display format

Control unit for external sorting device

In order to be able to guide the accepted coins into the cash-box or, e.g., into change tubes or hoppers, you can equip the totalizer with the NRI 3-fold sorting device or with another sorting device.

Sorting principle

The sorting gates are activated via the 3-pole JST plug on the rear of the device (see Fig. 1a and 1b) and via three sorting control lines. Since these are bidirectional sorting control lines, the totalizer can also receive signals. If, for example, a connected hopper or change tube is full of coins and if these send an appropriate "Full" signal to the totalizer, all the other coins are directed into the cash-box until the hopper/change tube is emptied or an amount has been paid out.

The G-13.mft can also be set by the manufacturer so that the return signal line sends a sort signal to the machine via the 10-pole connecting cable (only standard totalizers, not ECV totalizers). In this case, the totalizer cannot receive any signals from an external sorting device.

WinEMP   Assignment coin type – sorting control line/return signal line and sorting time (how long should the activating period be? 300–1000 ms)

> *Whilst the totalizer is sorting an accepted coin (= sorting time), it cannot accept any further coin.*

Sorting with NRI sorting device

When the optional NRI sorting device is used (see also product pages on the internet (www.nri24.com)), the individual coin types can be distributed regardless of their dimensions among the three sorting chutes. Each chute can be defined as a cash-box chute.

☞ *For details on how to connect the NRI sorting device to the totalizer, see Chap. 5 "Starting up".*
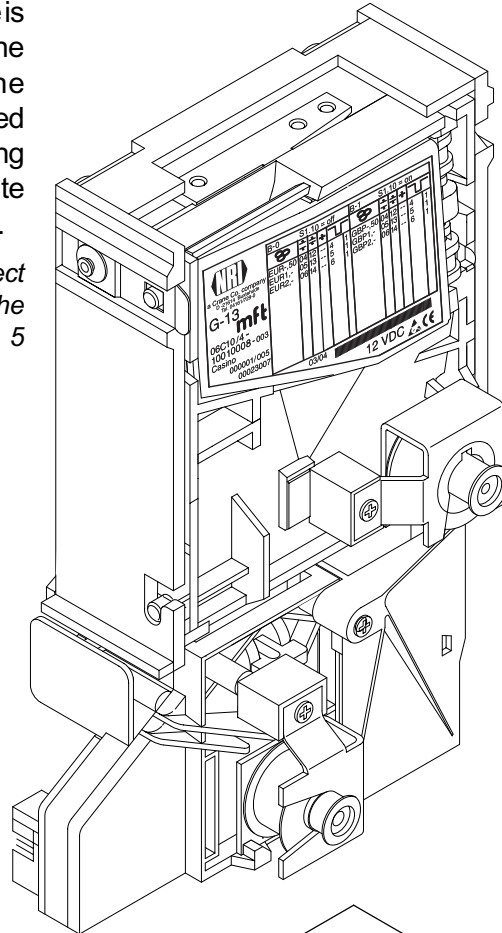
The following table shows which sorting control line must be activated in order to sort coins into a specific sorting chute:

Sorting chute	Sorting control line
Left	1
Middle	–
Right	2
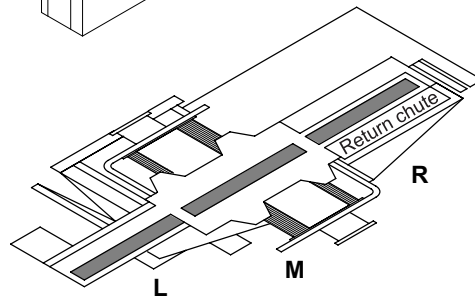
Options

The G-13.mft totalizer can optionally be equipped for the following applications at the manufacturer.

Battery or low-power applications

If the G-13.mft is to be used independent of the mains in battery-operated machines, it can optionally be fitted with a wake-up sensor (not available for retrofitting).

The wake-up sensor monitors the insertion area of the totalizer. The first coin inserted wakes up the totalizer. The coin is measured and accepted or rejected, a possible credit or timer time is processed. If the vending process is completed, the totalizer returns to sleep mode after 3.5 sec. A credit which is not honoured is stored for 5 min. after the last coin has been inserted (battery protection) before the totalizer returns to sleep mode. The current consumption in sleep mode is less than 15 µA until the unit is woken up again by insertion of a coin. (See section "Interfaces" in Chap. 8 "Technical Data")

WinEMP

Credit dwell time: Possible setting: 1–25 min., standard setting: 5 min.

If the device is in teach mode, it remains awake until the coin/token is taught, i.e. the teach mode is switched off again.

At the factory the totalizer can optionally be set, so that it transmits a wake-up signal to the machine via the return signal line, as soon as it is woken up by insertion of a coin (not ECV totalizer).

High-voltage applications up to 42 V

If the totalizer is to be supplied with more than 10–16 V, at the factory it can be equipped with a switching power supply which makes a supply voltage of up to 42 V possible (not available for retrofitting).

5   Starting up

This chapter describes how to:
- start up the G-13.mft totalizer in a machine
- install the NRI sorting device

Installing totalizer in the machine

To install the G-13.mft in a machine with parallel interface:

1 Set the price(s) using the switching blocks on the rear of the device (see section "Function and operation of the 1/2-price totalizer/timer/ TV totalizer" in Chap. 4).

2 If necessary, set the timer time (see section "Function and operation of the timer" in Chap. 4).

3 If necessary, set the pulse pause time (see section "Function and operation of the TV totalizer" in Chap. 4).

4 If necessary, install the sorting device on the totalizer (see section "Installation of the sorting device ..." in this chapter).

5 Disconnect the machine from the power supply.

6 Hang the totalizer in the machine mount using the lateral mounting studs **1** (see Fig. 4).

7 Connect the totalizer to the machine using the 10-pole interface **3** and the appropriate connecting cable (see Fig. 4).

8 Reconnect the power supply to the machine.

⚠ **Make sure the correct supply voltage is connected (see label).**
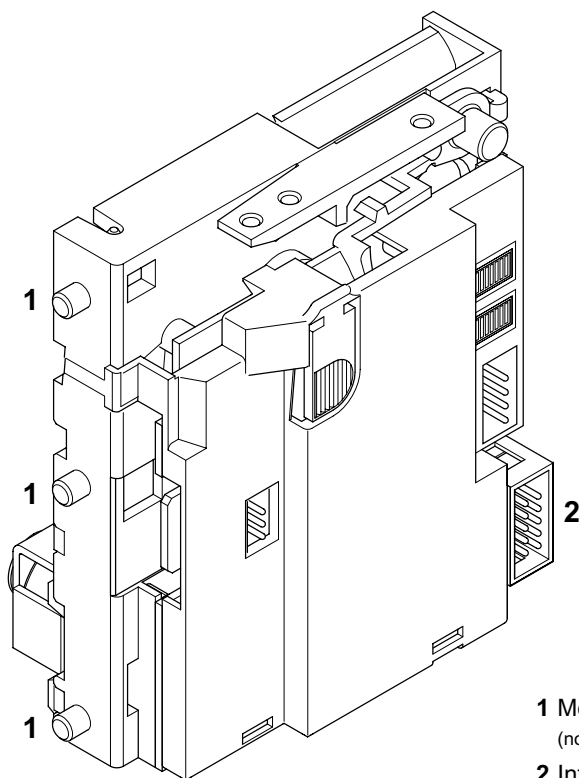
1 Mounting studs
(not illustrated on the left-hand side of the device)

2 Interface – machine

Fig. 4: Installation

Installing sorting device ...

If you want to operate the G-13.mft with the NRI 3-fold sorting device, you must use a special bracket to install the NRI sorting device on the top entry model or on the front entry model:

... on the top entry model

1 If necessary, fasten chute extension **1** with screw **2** to sorting device **3** (see Fig. 5a).

2 Fasten mounting frame **4** by means of screws **5** and **6** to the rear of the sorting device.

3 Hang the totalizer by its mounting studs **7** in the mounting frame.

4 Use the 3-pole sorting plug **8** on the PCB **9** and on the rear of the totalizer to connect the sorting device to the G-13.mft with the help of the appropriate sorting cable.

5 Use the 10-pole connecting plug **10** on the PCB **9** and on the rear of the totalizer to connect the sorting device to the G-13.mft for the power supply of the sorting magnets with the help of the appropriate connecting cable.

6 Use the 10-pole connection plug **10** on the PCB **9** and the same connecting cable to connect the totalizer to the machine (see also section "Installing totalizer in the machine" in this chapter).
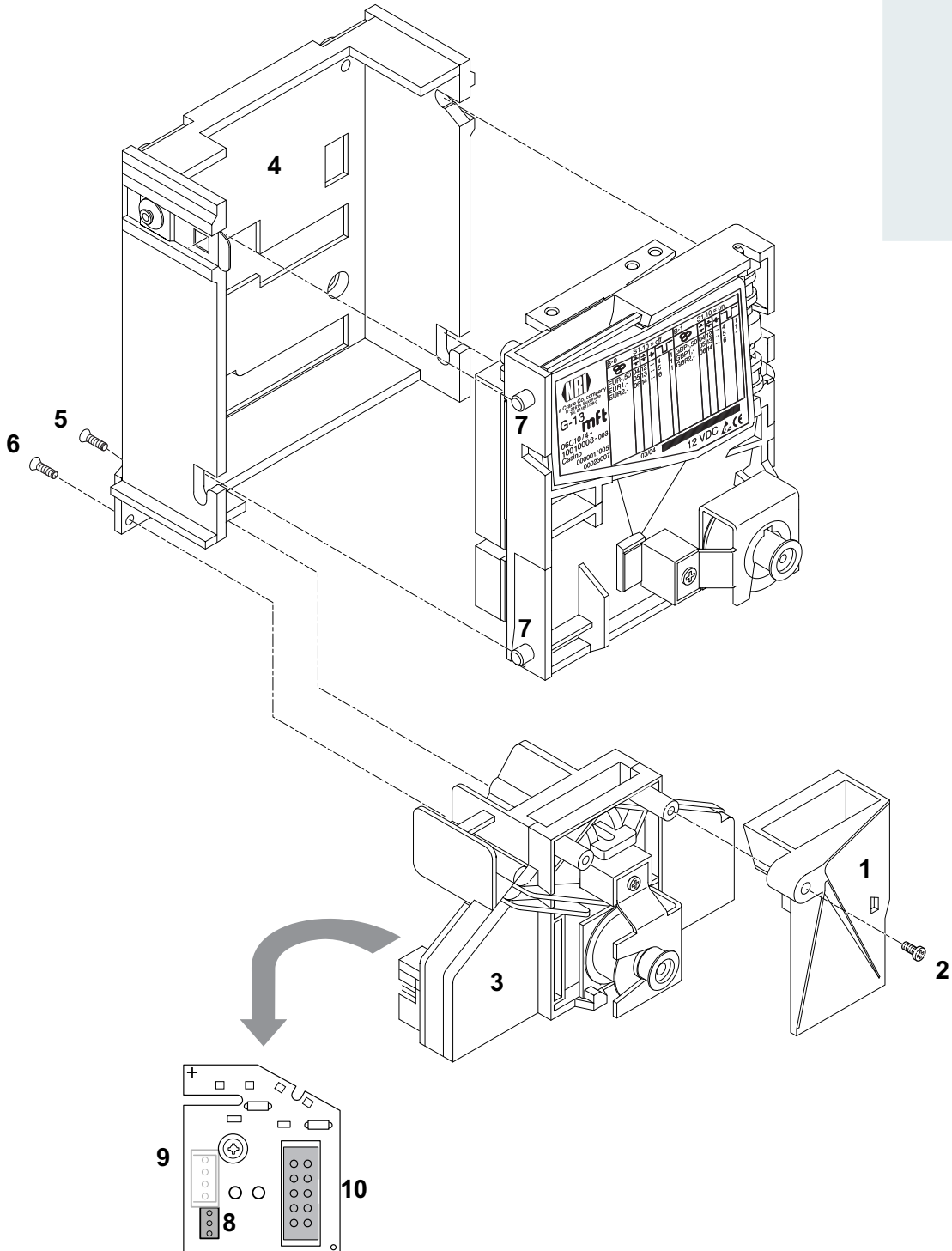
Fig. 5a: Connect G-13.mft, top entry model, to NRI sorting device

... on the front entry model

1 If necessary, fasten holding plate **1** with two screws **2** and **3** to sorting device **4** (see Fig. 5b).

2 Remove screw **5** from totalizer.

3 Use the holding plate to insert the sorting device from the right-hand side onto the totalizer.

4 Fasten the sorting device with screw **5** to the totalizer.

5 Use the 3-pole sorting plug **6** on the PCB **7** and on the rear of the totalizer to connect the sorting device to the G-13.mft with the help of the appropriate sorting cable.

6 Use the 10-pole connecting plug **8** on the PCB **7** and on the rear of the totalizer to connect the sorting device to the G-13.mft for the power supply of the sorting magnets with the help of the appropriate connecting cable.

7 Use the 10-pole connection plug **8** on the PCB **7** and the same connecting cable to connect the totalizer to the machine (see also section "Installing totalizer in the machine " in this chapter).
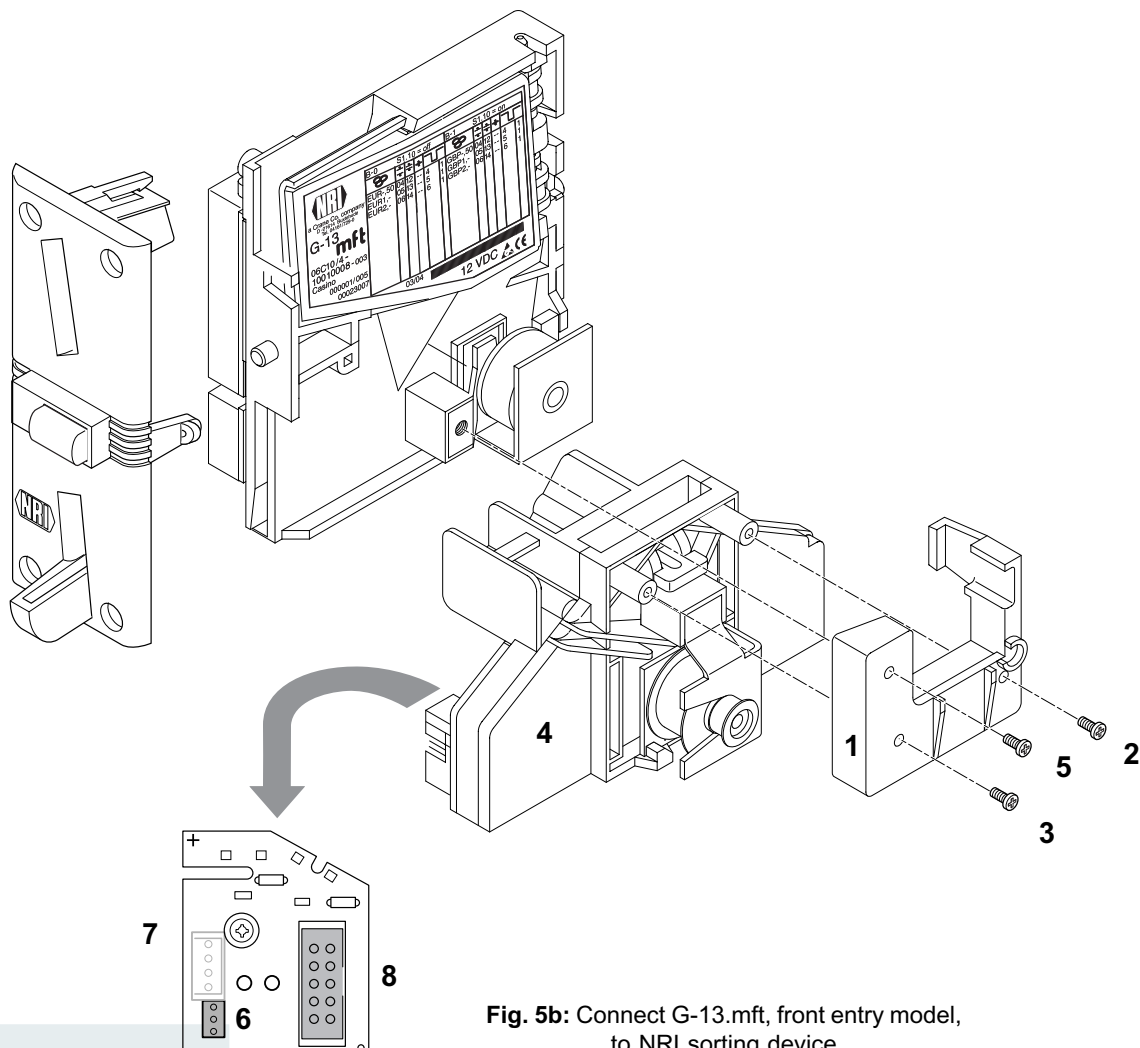
Fig. 5b: Connect G-13.mft, front entry model, to NRI sorting device

6   Maintenance and service

In this chapter you will find out how to
- clean the G-13.mft and
- remedy the cause of a malfunction.

Cleaning totalizer

The totalizer must only be wiped clean from time to time with a damp cloth (lukewarm water with a small amount of washing-up liquid). Beyond that, no further maintenance work is required.

> **Under no circumstances may the cloth be so wet that fluid runs into the device. Otherwise the PCB will be damaged. Do not use any solvents or scouring agents that will attack the plastic material of the device.**

1 Pull the machine's mains plug.

2 Carefully open the flight deck **1** on the left-hand side and hold it open (Fig. 6).

3 Use a cloth to wipe off the coin runway inside the totalizer.

4 Close the flight deck again.

5 Reconnect the machine to the mains supply.
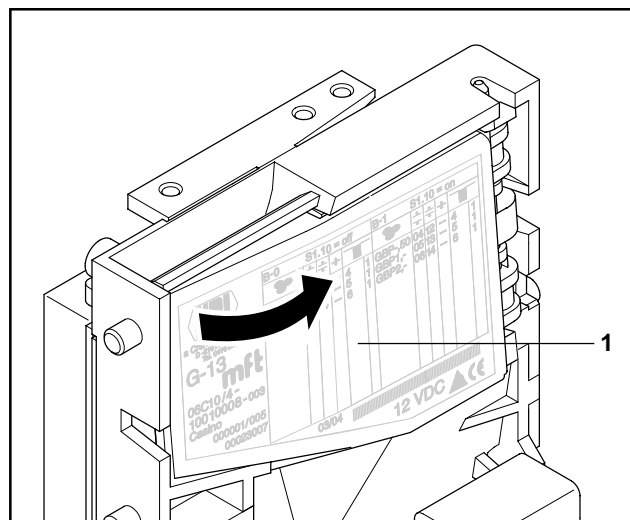
Fig. 6: Open the flight deck of the totalizer

Troubleshooting

Malfunctions can occur in all electronic devices. These do not always have to be faults in the device. In many cases the reason is improper connections or incorrect settings. Therefore: please first of all check, whether the malfunction can simply be remedied using the following table:

Problem	Possible causes	Remedy, hints
Totalizer does not accept coin	No power supply	• Connect ribbon cable to totalizer and machine correctly • Supply vending maching with voltage
	Return lever/button pressed/got stuck	Make sure, that return lever/button is not inadvertently pressed
	Coin runway dirty	Open flight deck and clean coin runway (see section "Cleaning totalizer" in this chapter)
	Coin inhibited	• Make sure that (common) inhibit line (pin 2/pin 6) is not activated by machine (see section "Interfaces" in Chap. 8 "Technical data") • Make sure that the coin is not inhibited using the DIL switches on the rear of the device or not only the narrow coin channel is enabled and the normal one is inhibited (see section "Inhibit coin types" in Chap. 4 "Function and operation")
	Price/time DIL switches set to OFF	Set price(s)/timer time (see section "Set the price(s)/timer time" in Chap. 4 "Function and operation")
Totalizer accepts coin but no credit is given	Coin does not exit the device	Make sure that the coin outlet is not jammed by foreign objects or devices connected to the bottom of the totalizer

Problem	Possible causes	Remedy, hints
Totalizer accepts coin, but display shows no timer time	Time DIL switch (S2) set to OFF	Set timer time (see section "Set the timer time" in Chap. 4 "Function and operation")

If the malfunction cannot be remedied, you can use the NRI tester

- G-19.0645 (5-digit display, for power supply of 220/230 V, ordering code 16183)/
- G-19.0567 (4-digit display, for power supply of 220/230 V, ordering code 7756)/
- G-19.0650 (5-digit display, for power supply of 110/115 V, ordering code 21410)

to test the signal lines of the connecting cable.

To remedy other faults please contact our service technicians.

7   The PC programming station WinEMP

This chapter provides general information concerning the PC programming station, the WinEMP software and the G-13.mft functions that can be configured with the help of these tools.

Function

The PC programming station WinEMP serves the purpose of diagnosis and individual configuration of NRI coin validators as well as the updating of the complete coin and device configuration using data blocks currently provided by NRI (data block download).

The WinEMP software identifies the connected coin validator and the device own data and presents that data on the screen of your PC.

Composition

The PC programming station for the workshop consists of (see also product accessory pages on the internet (www.nri24.com)):

- WinEMP PC software
- Card reader G-19.0647 incl. chip card with authorization licences
- Voltage supply and PC interface for totalizer:
  - Tester G-19.0645 (5-digit display)/G-19.0567 (4-digit display)
    (for 220/230 V mains supply)/
    Tester G-19.0650 (5-digit display)
    (für 110/115 V mains supply) +
    adapter package G-19.0640,
    if also the machine interface is to be tested, or
  - PC interface G-55.0359, if the machine interface is not to be tested

If you already have the NRI tester G-19.0641, you can use this tester instead of the PC interface G-55.0359 mentioned above.

For details on how to connect this device environment to your PC and how to use WinEMP, please refer to the separate operating instructions for the WinEMP software.

Which functions can be sets?

- Acceptance of genuine coins and rejection of false coins (acceptance band adjustment following the insertion of genuine coins and false coins)
- Attraction time of the acceptance gate
- Data-management of residual credit
- Display (indication)
- On-request mode (for timer and TV totalizer)
- Bonus levels or bonus coins, identification of bonus coins (for TV totalizer)
- Inventory function (for timer and TV totalizer)
- Warning signal before time lapse (for timer)
- Inhibition of coin acceptance during an elapsing time (for timer)
- Inhibition of coins via assignment of coin channel to DIL switches S1.1–8 (internal inhibition, only single block data-management)
- Deactivation of coins on a long-term basis
- Sorting via
  – assignment of coin channel to sorting control line
  – sorting time
- Smallest coin value as a reference value and basis of calculation
- New coins/tokens (creating a new acceptance band and assigning a coin value)
- Data block download for current coin and device data
- Operating mode 1/2-prize totalizer/timer/TV totalizer

8   Technical data

This chapter provides information about

- all relevant G-13.mft data
- the CE certification
- the machine and sorting interfaces
- ordering codes for the G-13.mft accessories

Device data

Supply voltage	10 V to 16 V DC, optionally up to 42 V DC (high-voltage)
Current consumption	Standby mode: approx. 30 mA Measuring mode: approx. 100 mA Coin acceptance: approx. 100 mA + approx. 3 W
Battery model	Sleep mode: $\leq$ 15 µA Standby mode: approx. 30 mA (Wake-Up-Mode) Measuring mode: approx. 100 mA Coin acceptance: approx. 100 mA + approx. 3 W
Electric strength Inputs/outputs	Max. 35 V
Current-carrying capacity, outputs	Max. 150 mA (open collector)
Temperature range	-25 °C to 70 °C
Temperature change	Max. 0.2 °C/min.
Rel. humidity	Up to 93 %
Condensation	Not permitted
Machine interfaces Standard totalizer	2 price/function outputs (open collector) (active low) Reset/request input (active high) Common inhibit input (active low) Return output (active low) Display control via 3 lines (Select/Data/Clock)
ECV totalizer (Italy)	2 price/function outputs (open collector) (active low) Reset/common inhibit input (active high) Request input (active low) Remaining game output (active low) Display control via 3 lines (Select/Data/Clock) For pin assignment see section "Interfaces" in this chapter

Sorting interface	Company: JST, www.jst.com Type: ZH connector; 1.5 mm
Coin acceptance	32 coin types max. in 2 x 16 or 1 x 32 channels Coin diameter: 15–31,5 mm (optionally up to 32.5 mm) Coin thickness: 1,5–2,5 mm (optionally bis 3.3 mm) Speed: 2 coins/sec.
Device dimensions	Height: 102 mm Width: 89 mm Depth: 52 mm (For mounting dimensions see separate documentation)
Mounting position	Vertical, max. deviation: ± 2°
Mark of conformity	CE (see next section)

CE certification

The CE certificate (CE = Communautés Européennes) confirms that our products comply with specified basic requirements of the applicable directive. The CE certificate is not a quality assurance certificate in terms of the quality expected by the manufacturer but only in terms of the quality demanded legally. It is a pure administrative certificate and is intended only as proof of compliance with the directives for the monitoring authorities and not directed at clients or final customers.

Which directives were applied can be seen in the declaration of conformity. The manufacturer must keep this declaration available for the monitoring authorities only (for a minimum period of 10 years after the last product has been introduced to the market). However, upon request we can provide copies of this declaration for our customers.

The following directives and their subsequent changes can be partially applied to our devices:

1. The EMC Directive (89/336/EEC)
   for devices which cause electromagnetic interference or are interfered with by such.
2. The Low Voltage Directive (73/23/EEC)
   for electrical operating means which are used with a nominal voltage of between 50 and 1000 V AC and 75–1500 V DC.
3. The CE Certificate Labelling Directive (93/68/EEC)
   Modification directive regarding the application and use of CE labels.

Interfaces (pin assignment and connection diagrams)

On the following pages you will find interface descriptions, connection diagrams and pin assignments for connecting the G-13.mft totalizer to

- the machine
- an external sorting device

G-13.mft standard totalizer – machine

Pin assignment

Pin 1	OUT	**Return line**/sorting/wake-up line: active low	
Pin 2	IN	**Common inhibit line**/reset/request line: active low	
Pin 3	OUT	Display (DATA)	
Pin 4	–	Ground (GND)	
Pin 5	OUT	Display (SELECT)	
Pin 6	OUT	**Price/function line 2**/inventory/warning line: active low	
Pin 7	OUT	Display (CLOCK)	
Pin 8	IN	**Reset/request line**: active high	
Pin 9	OUT	**Price/function line 1**: active low	
Pin 10	–	Operating voltage U_B = +12 V (10 V–16 V DC)	
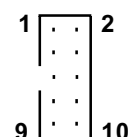
(Connector diagram: pins 1, 2 at top; pins 9, 10 at bottom)

Interface description

Price/function line 1

- Price 1 reached (1/2-price totalizer)
- Time is running (timer)
- Output credit pulses (TV totalizer)

Price/function line 2

- Price 2 reached (1/2-price totalizer)
- Optional: Output warning signal for residual time (timer)
- Optional: Output inventory pulses (TV totalizer)

Reset/request line

- Reset (1/2-price totalizer)
- Optional: Stop time (timer)
- Optional: Time start/game start in on-request mode (timer (alternative)/TV totalizer)

Return line

- Return button pressed or
- Optional: Output sorting signal or
- Optional: Output wake-up signal (devices with wake-up sensor)

Common inhibit line

- Machine inhibits coin acceptance,
- Optional: Reset (1/2-price totalizer),
- Optional: Time start/game start in on-request mode (timer/TV totalizer)

Connection diagram

G-13.mft ECV totalizer – machine (Italy)

Pin assignment

Pin 1	–	Ground (GND)
Pin 2	–	Supply voltage (10–16 V DC)
Pin 3	OUT	Display (DATA)
Pin 4	OUT	Display (SELECT)
Pin 5	IN	**Request line**: active low
Pin 6	IN	**Common inhibit/reset line**/request line: active high
Pin 7	OUT	Display (CLOCK)
Pin 8	OUT	**Price/function line 1**: active low
Pin 9	OUT	**Price/function line 2**/inventory/warning line: active low
Pin 10	OUT	**Remaining game line**: active low
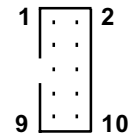
All signals must be debounced from the input side.

Interface description

Price/function line 1

• Price 1 reached (1/2-price totalizer)

• Time is running (timer)

• Output credit pulses (TV totalizer)

Price/function line 2

• Price 2 reached (1/2-price totalizer)

• Option: Output warning signal for residual time (timer)

• Option: Output inventory pulses (timer (alternative)/TV totalizer)

Common inhibit/reset line

• Machine inhibits coin acceptance,

• Reset (1/2-price totalizer)

• Option: Stop time (timer)

• Option: Time start/game start in on-request mode (timer (aternative)/ TV totalizer)

Request line

Option: Time start/game start in on-request mode (timer/TV totalizer)

Remaining game line

Option: Further games can be triggered in on-request mode (TV totalizer)

Connection diagram
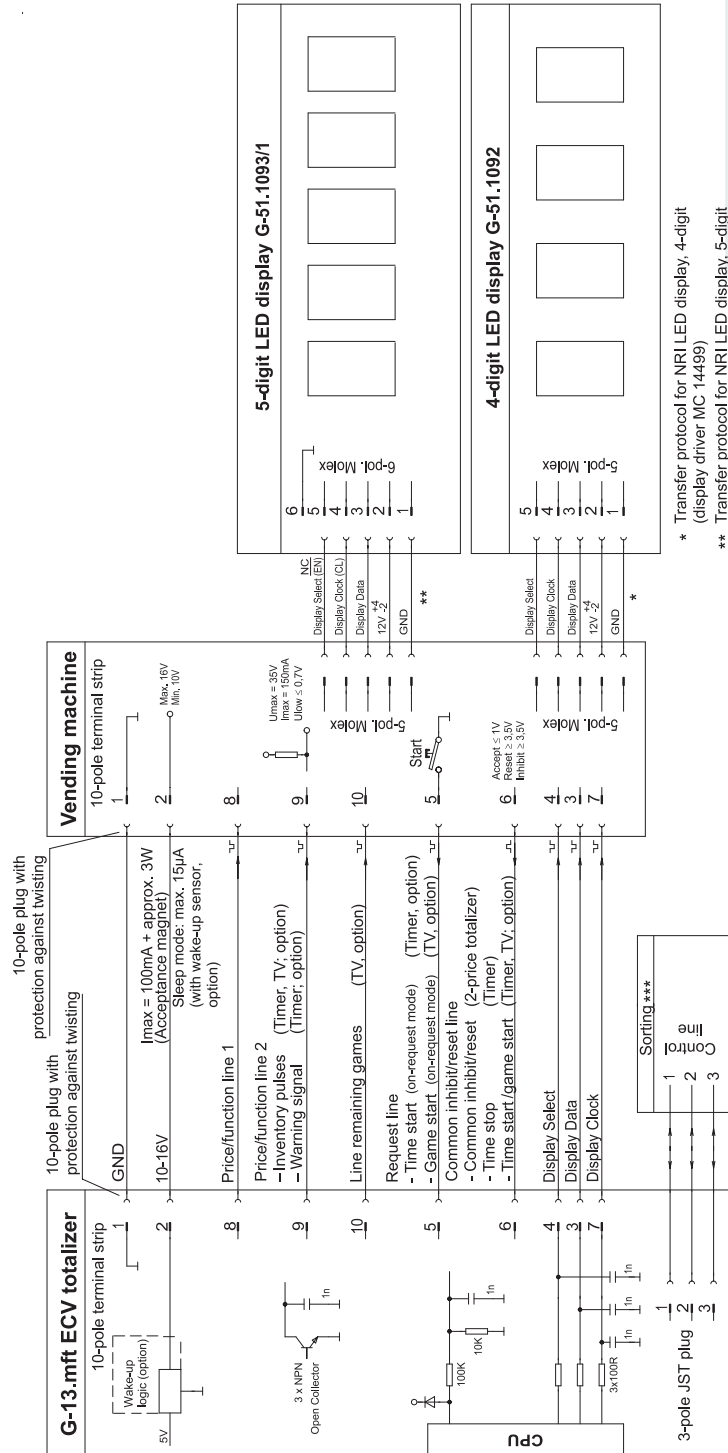
*   Transfer protocol for NRI LED display, 4-digit (display driver MC 14499)
** Transfer protocol for NRI LED display, 5-digit (display driver MC 14489)
*** Also refer to section "G-13.mft – external sorting device" in this chapter

Subject to technical changes!

G-13.mft – external sorting device

Pin 1   OUT   Sorting control line 1

Pin 2   OUT   Sorting control line 2

Pin 3   OUT   Sorting control line 3

Examples for controlling a sorting device

1 = Tube full ⟶ no sorting
0 = Tube empty
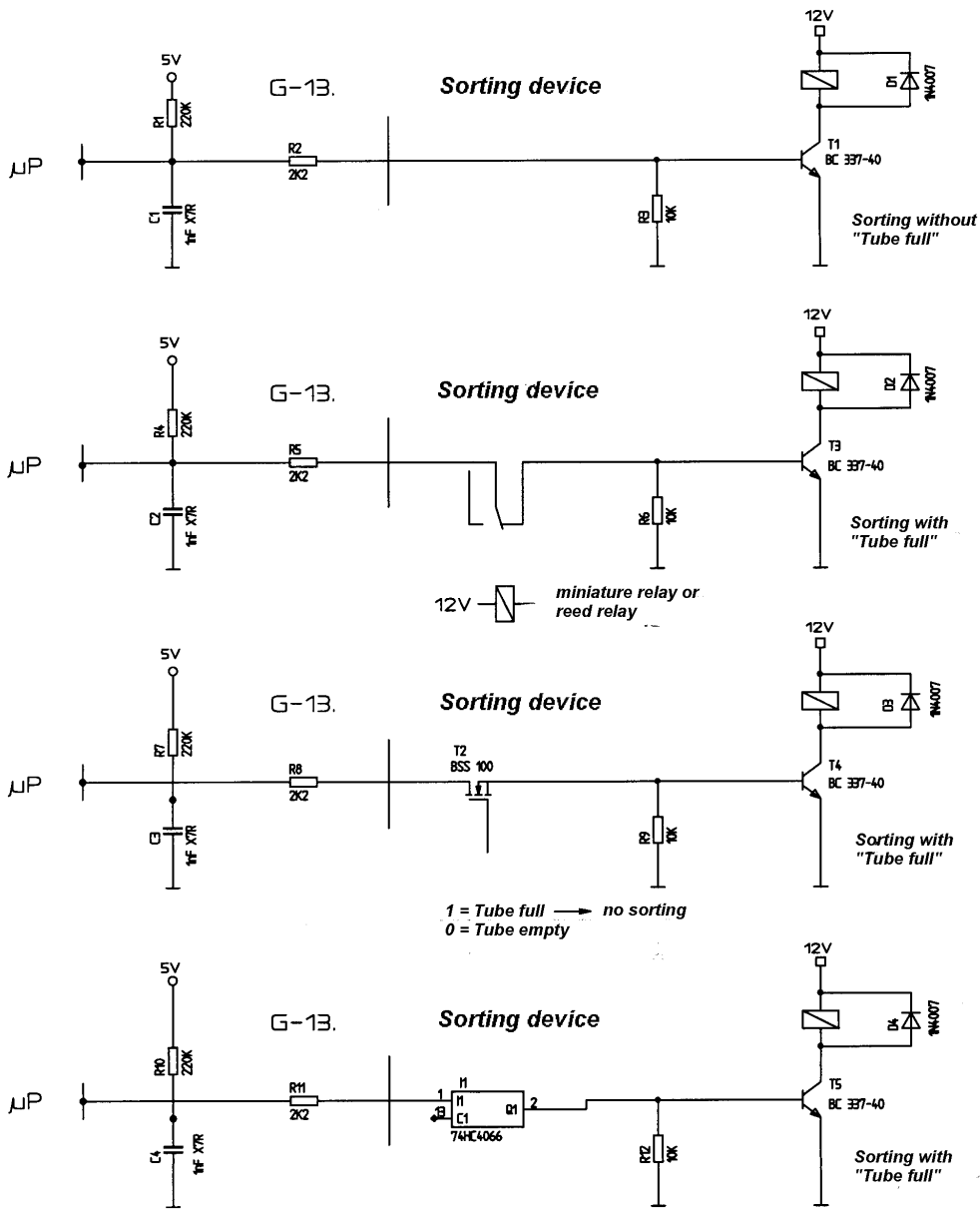
If higher current is necessary, Darlington transistor possible
Without "Tube full" binary coding of the 3 outputs possible

Accessories

In order to test the G-13.mft or adapt it to your individual needs, you can acquire the following accessories from NRI.

Front plates

For all details regarding the MINI and MIDI front plates (also with external wake-up sensor) please refer to our web pages for the product G-13.mft on the internet (www.nri24.com).

Display

For all details regarding the 4 or 5-digit display please refer to our web pages for the product G-13.mft on the internet (www.nri24.com).

Sorting device

For all details regarding the 3-fold sorting device please refer to our web pages for the product G-13.mft on the internet (www.nri24.com).

External wake-up sensor

For all details regarding the external wake-up sensor which is to be mounted on the MIDI front plate please refer to our web pages for the product G-13.mft on the internet (www.nri24.com).

Tester

Accessories	Ordering code
Tester G-19.0645 with 5-digit display, for mains votage of 220/230 V	16183
G-19.0567 with 4-digit display, for mains votage of 220/230 V	22601
G-19.0650 with 5-digit display, for mains votage of 110/150 V	21410
Tester G-55.0359 (only as power supply for coin acceptance test) + ...	26125
12-V wall power supply (400 mA) (with international adapter)..	26482

WinEMP PC programming station

For all details regarding the WinEMP PC programming station please refer to our web pages for the product accessories on the internet (www.nri24.com).

Index

Glossary

Acceptance band
A range of acceptable measured values of one → *coin type* (with specific → *coin properties*) defined by an upper and lower limit value.

Acceptance gate
The acceptance gate diverts the inserted coins into the acceptance or return area of the coin validator.

Accepted coin sensors
The accepted coin sensors are positioned in front of the cash-box coin outlet of the coin validator and check whether accepted coins fall unhindered into the cash-box chute.

Attraction duration
The attraction duration is used to specify the period of time for which the solenoid is to attract the → *acceptance gate* in order to guide the accepted coins to the cash-box or an external sorting device.

Block
→ *Memory block*

Channel
→ *Coin channel*

Coin acceptance band
→ *Acceptance band*

Coin channel
Coin channels are used to describe → *coin types* using their different → *coin properties* (alloy, size, etc.). The required coin properties of a coin type are defined in → *acceptance bands* which are assigned to the coin channels, together with other coin information, for further processing.

Coin properties
Coin properties are measured when a coin is inserted into the coin validator. These are e.g. material, thickness, volume, minting, diameter, mass, hardness, etc.

Coin type
One coin type includes all coins for which the → *coin properties* agree.

Common inhibit line
Signal line between machine control unit and coin validator which can block acceptance of all coins.

Data block update
When updating a data block (set) (2 data blocks) using WinEMP, the data blocks for the connected coin validators are loaded quickly and easily from the internal hard disk of your PC into the coin validator. By doing this, a new data block is loaded into → *memory block* 0 (and memory block 1). The new data blocks contain different configurations of → *coin channel* data, e.g. current limit values of the → *acceptance bands* for a currency or new inhibiting or sorting information.

ECV   **E**lectronic **C**oin**V**alidator

ECV totalizer   Totalizer model that differs from the standard totalizer model by a machine interface with different pin assignment. The G-13.mft ECV totalizers are designed specifically for the machines of the Italian market.

Memory block   Memory of the coin validator. At the manufacturer's company, a customer-specific setting is programmed to determine whether the 32 → *coin channels* of the G-13.mft are to be data-managed in one memory block (single block data-management) or, when divided into 16 channels each, in two memory blocks (double block data-management). Two (memory) blocks 0 and 1 can be used to data-manage two independent configurations of coin channel data (e.g. two currencies). However, for coin validator operation, only one memory block with 16 channels can be active at a time; the other block is inhibited.
                           The memory block(s) can be updated using WinEMP (→ *data block update*).

On-request mode   For the timer and TV totalizer operation, the on-request mode can be activated by the manufacturer or using the configuration software. In that mode, the signals for starting, e.g., a game are not transmitted immediately to the machine as soon as the credit reaches the price but only after the customer has pressed a start button.

Return line   When the return lever/button on the coin validator is operated, a return signal is transmitted to the return line. The coin validator then releases all the coins and foreign bodies inside the device.

Sorting control line   To sort the cash coins with an external sorting device, the coin validator has three sorting control lines. Alternatively the → *return signal line* can be used for sorting (not with the → *ECV totalizer*).

Sorting gate   The sorting gates are activated in the coin validator depending on the run time of accepted coins and direct the coins to be sorted into the return area or coin outlet towards the cash-box or external sorting device.

Sorting time   The sorting time specifies the switching times of an external sorting device.

String sensor   The coin validator's optional sensor recognizes a coin inserted with a piece of string attached to it. The coin is not accepted for payment.

Switching blocks The two switching blocks are located on the rear of the coin validator and incorporate 10 DIL switches each. Each switch has a specific function, e.g. setting the prices, inhibiting individual or grouped → *coin channels*.

Teach mode   In the teach mode, the last eight → *coin channels* can be assigned new coin types or tokens on site at the machine without configuration software, which means that these newly configured coins are accepted in the respective coin channel.

Token   Tokens are accepted for payment at machines instead of coins in a currency.

Wake-up sensor   Optional sensor behind the coin insert funnel, which monitors the insertion area of the totalizer and wakes up the totalizer after the first coin has been inserted for the period of time necessary for processing coins and credit. Totalizers with wake-up sensor are used in battery and low-power applications, as they are in sleep mode most of the time. The current consumption in sleep mode is less than 15 µA.