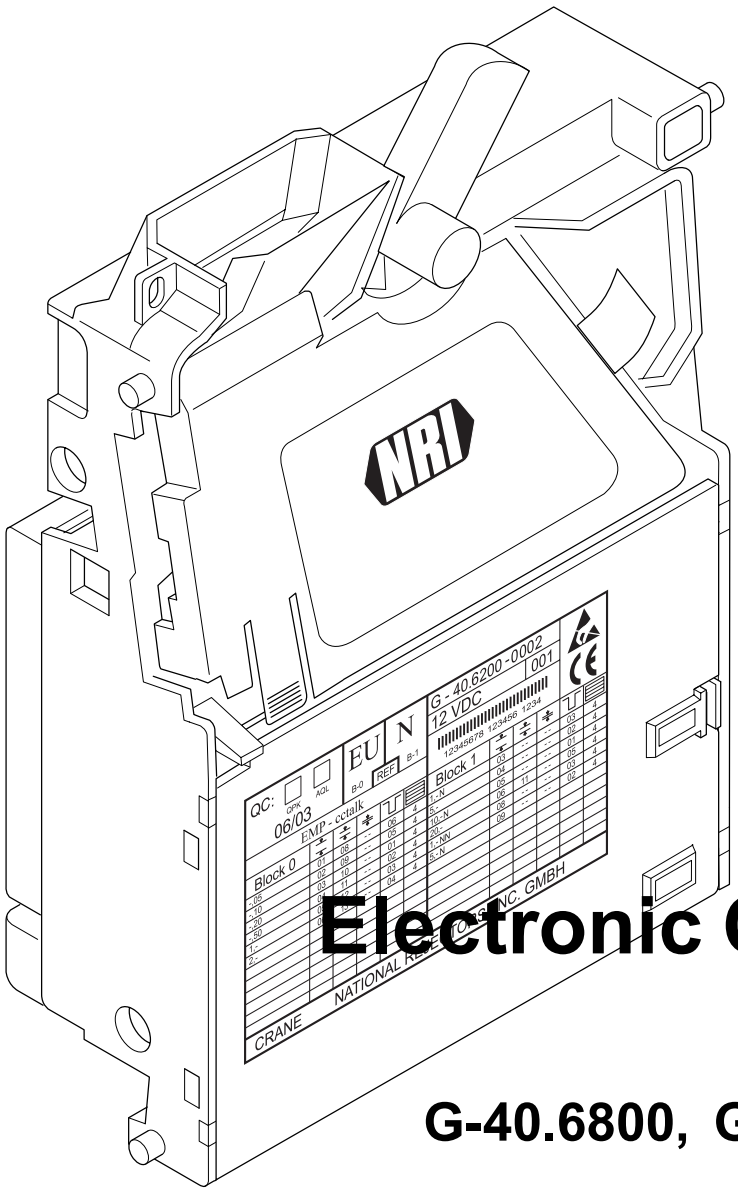
Technical Documentation

A Crane Co. Company




# Electronic Coin Validator

# G-40 S1

## G-40.6800, G-40.7800, G-40.8800

## Operating instructions

01.06 GS/ds
Edition 1.2
BA.G40S1-GB

RoHS

CRANE

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# 1 General information

This chapter should provide a general overview of the advantages and options regarding the coin validator G-40 S1. 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-40.6800 with serial S1 interface. Afterwards, chapters 6 und 7 explain the necessary steps for starting up and operating the coin validator. The chapters „Technical data“, „Index“ and „Glossary“ reduce the search for specific explanations.

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

- **Safety instructions** that must be taken into account in order to protect operators and equipment have been written in bold print and provided with the pictogram ⚠.
- Special *notes*, which are there to facilitate the use of the coin validator, have been written in italics and been given the pictogram ☞.
- **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 content of the chapter.

To configure the coin validator, reference is made to the separate software instructions for the NRI PC software "WinEMP" and for the NRI Palm handheld application "PalmEMP" and to the description of the tester G-55.0338 (cp. also Chap. 9 "Which functions can be set using WinEMP/PalmEMP?"):

- "WinEMP – The configuration and diagnostics program for NRI coin validators, operating instructions for the G-40"
- "PalmEMP – Operating instructions for configuration of coin validator G-40"
- "Tester G-55.0338" for G-40 S1

☞ *If these instructions are not available to you, they can be downloaded at any time from the NRI homepage (www.nri.de) in a compressed PDF format.*

# General information about the coin validator G-40 S1

The electronic coin validator G-40.6800 with serial S1 interface in standardized 5" format is based on the tried and tested features of the G-40.0800 S1. Communication with the vending machine control system is also carried out using the serial S1 data transmission system based on the multi drop bus (MDB), whereby the coin validator functions as a slave and the vending machine as a master. Due to its modular and compact design, the G-40 S1 is ideally suited for amusement, vending and service machines.

16 measuring parameters ensure a reliable acceptance of genuine coins or rejection 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-40 S1 has 16 coin channels in both of its (memory) blocks.

To be able to react as quickly as possible to new false coins and to enable you to make your individual adjustments, the coin validator can be connected to a PC programming station which is made up of the NRI configuration and diagnostics software "WinEMP" including card reader and the NRI tester G-55.0338.

With the aid of the Palm handheld software PalmEMP you can configure the coin validator directly at the machine independently from the PC.

New coins, which are not taken into consideration by the manufacturer, can also be programmed directly on the machine, without configuration software, in teach mode.

## Advantages

- Serial interface
  - less susceptible to faults and repairs because of reduced number of signal lines and electronic components
  - flexible and extensive communicating with the vending machine control system
  - straight-forward transmission and control of device functions
  - possibility to connect to additional peripheral equipment
  - economical device design
- Acceptance speed of 3 coins per second
- 16 coin channels per memory block
- 2 memory blocks 0 and 1 with differently configured coin information
- Optional teach mode for 3 coin channels
- Operating and manipulation security thanks to optical accepted coin sensor and sorting control in coin outlet area
- Protection against manipulation with optional string recognition
- Interface for connection to a programming station which enables immediate reaction to the use of false coins
- Flash technology for uncomplicated and time-saving software adjustments

# 2 Safety instructions

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

## Proper use

The electronic coin validators G-40.6800 with the serial S1 interface are intended for use in amusement, vending and service machines that are equipped with the serial S1 interface. Only use the coin validator for this purpose. Under no circumstances can the manufacturer be held liable for any damage or loss resulting from improper use of the device.

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 which may be damaged beyond repair by electrostatic discharge. Please observe the handling instructions for components exposed to the risk of electrostatic discharge.**

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

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

**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.**

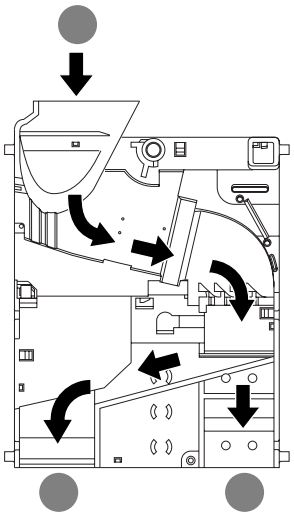
**We reserve the right to make technical modifications to the device which are not covered by these instructions.**

# 3 Models

The G-40 S1 is available in three different models. The difference is in where the coin insert area and the return area are positioned. The following combinations for the position of the coin insert and return area are possible.

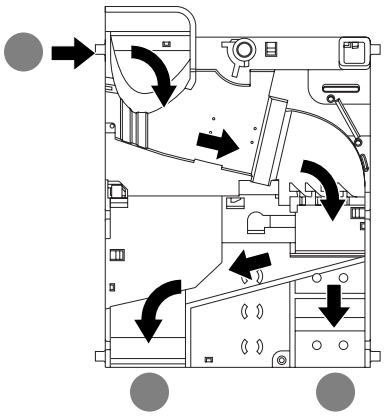
## Top entry and bottom return (G-40.68xx)

With this model of the G-40 S1, the coins are inserted into the device from the top and, if they are not accepted, returned via the return area at the bottom.

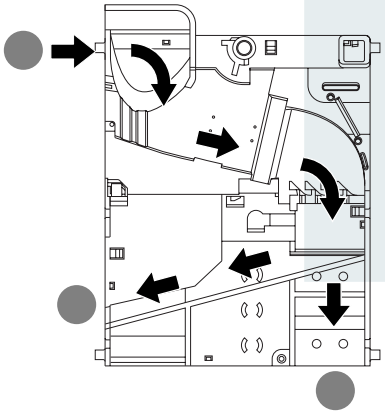


## Front entry and bottom return (G-40.78xx)

With this model of the G-40 S1, the coins are inserted into the device from the side and, if they are not accepted, returned via the return area at the bottom. The coin validator with front entry generally has the NRI front plate G-42.4002 (ordering code: 12918) fitted to the left-hand side of the device (see section „Accessories“ in Chap. 10 "Technical data"). However, this model is also available without a front plate.



## Front entry and front return (G-40.88xx)



With this model of the G-40 S1, the coins are inserted into the device from the side and, if they are not accepted, returned via the return area also situated on the side. The coin validator with front entry and front return generally has the NRI front plate G-42.4001 (ordering code: 10897) fitted to the left-hand side of the device (see section "Accessories" in Chap. 10 „Technical data“). However, this model is also available without a front plate.

# 4 Design

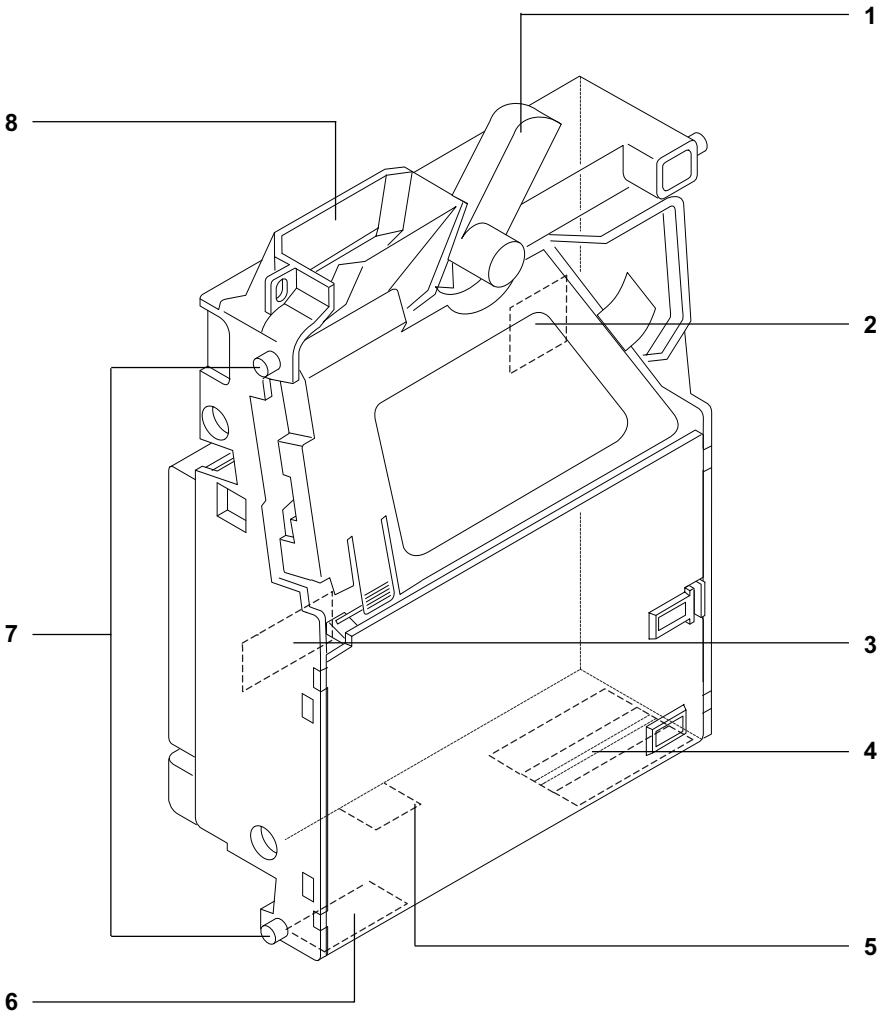



**Fig. 1:** Design

**1** Return lever
**2** Switching block
**3** Interface S1 – machine/WinEMP configuration software
**4** Coin outlet – cash-box/sorting
**5** Interface (PCB direct plug) – PalmEMP configuration software
**6** Coin outlet – return area
**7** Mounting studs
**8** Coin insert funnel

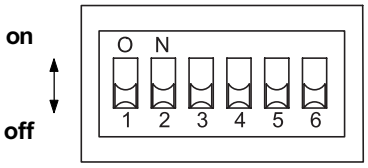
Coins inserted into the coin validator pass through the coin insert funnel **8** into the measurement and validation area of the device, in which their coin properties are compared with the values of the stored acceptance bands. Coins rejected by the coin validator are directed into the return area **6** and coins accepted leave the device through one of the up to five possible coin outlets **4**, in order to be either collected in change tubes or hoppers or directed to the cash-box. (See Fig. 1)

By means of the S1 interface **3** on the rear the coin validator can be connected to the machine and the WinEMP programming station to the PC. Using the PCB direct plug **5** at the bottom of the device a Palm handheld with the application PalmEMP is connected. (See Fig. 1 and section "Interfaces" in this chapter)

Individual settings such as selecting the memory block or teaching new coins can be made using the switching block **2** also on the rear of the device (see Fig. 1 and section "Switching block" in this chapter).

## Switching block

The coin validator has a switching block **2** with six DIL switches S1–6 on the rear of the device (see Fig. 1).




| DIL switch | off | on |
|---|---|---|
| S1 | (Memory) block 0 | (Memory) block 1 |
| S2 | Block switchover via coin validator (DIL switch S1) | Block switchover using vending machine (serial bus) |
| S3 | – | Teach mode – coin channel 14 |
| S4 | – | Teach mode – coin channel 15 |
| S5 | – | Teach mode – coin channel 16 |
| S6 | Operating mode | Teach mode |

The first two DIL switches S1 and S2 of the switching block are used to determine which of the two memory blocks the coin validator is to access. DIL switch S2 determines whether the memory block is to be selected from the vending machine via the serial data bus (standard) or via the coin validator. If the switching block is to be activated via the coin validator, DIL switch S1 is used. (See section "Select memory block" in Chap. 7 "Operation")

DIL switches S3 to S6 are used in the optional configuration of new coins or tokens in teach mode (see section "Teach mode (optional)" in Chap. 7 "Operation").

## Return lever

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

The coin validator G-40 S1 can be equipped, depending on the dimensions of the vending machine, with four different return levers (see Fig. 2).

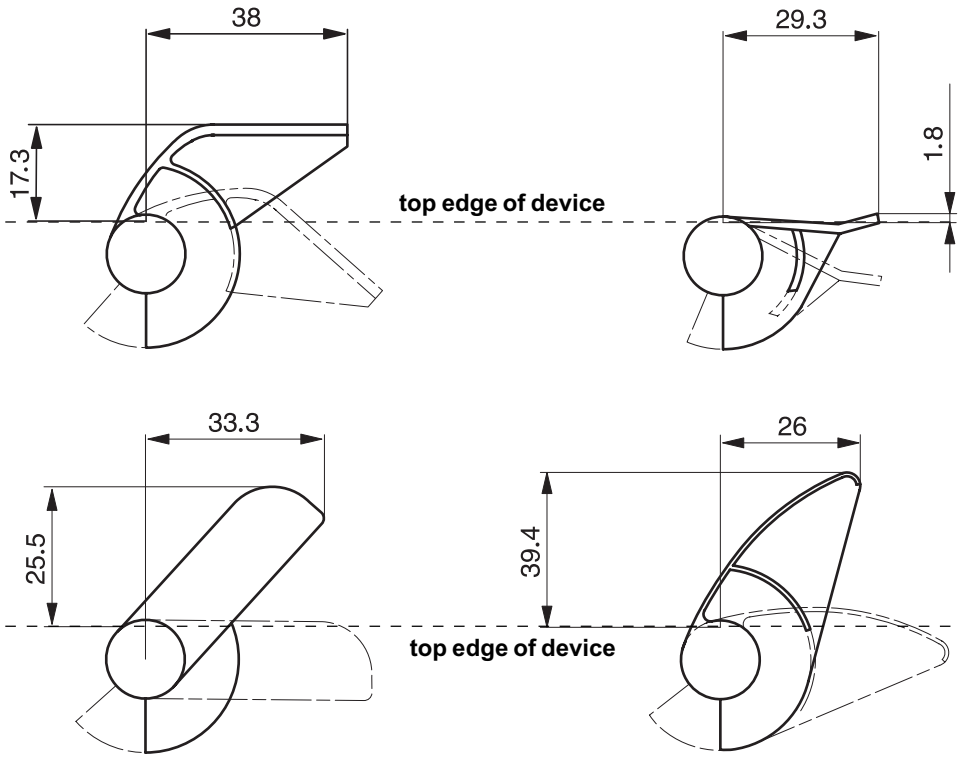



**Fig. 2:** Return lever

# Interfaces

The coin validator has two interfaces: one to the machine as well as to the tester of the PC configuration software and the other to the Palm handheld.

## Interface – machine

The rear of the coin validator has on the bottom right-hand side a 10-pole S1 interface **3** to the machine (see Fig. 1).

The coin validator is connected to the machine via a 10-pole cable through which it can receive information from the machine or respectively send information to the machine. The machine operates as a master and the coin validator as a slave. The master can communicate with several slaves (e.g. coin and bill validator). To ensure unambiguous communication each slave device has its own S1 address. The address of the coin validator is "15".

*You will find a detailed description of the serial S1 interface in the "Specification of the G-40.6800 S1", which is placed at your disposal by the company NRI upon your request.*
*For further information about the assignment of individual plugs (pins) see section "Pin assignment and connection diagram" in Chap. 10 "Technical data".*

## Interface – WinEMP configuration software

To configure the coin validator with the help of a PC programming station, the device is connected to the tester G-55.0338 via the S1 interface **3** and the tester is connected to a PC via the WinEMP card reader (see Fig. 1). The device can then be set using the configuration and diagnostics software WinEMP.

(See section "Accessories" in Chap. 10 "Technical data" and Chap. 9 "Which functions can be set using WinEMP/PalmEMP?")

## Interface – PalmEMP configuration software

If the coin validator is to be configured on site using the PalmEMP software, the G-40 S1 is connected by means of the PCB direct plug **5** to a Palm handheld (see Fig. 1).

(See section "Accessories" in Chap. 10 "Technical data" and Chap. 9 "Which functions can be set using WinEMP/PalmEMP?")

## Label

The label of the coin validator contains all the data defining the device such as device number and nominal voltage as well as customer-specific default values such as coin type and sorting:

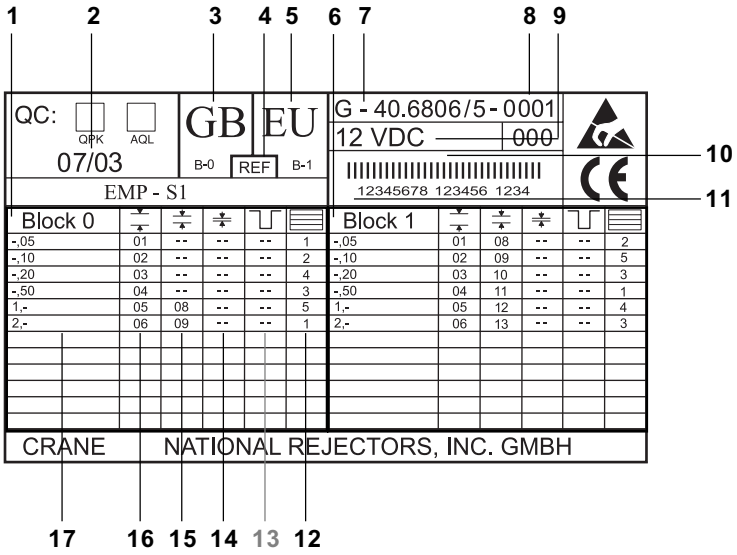



**Fig. 3:** Label

**1** Coin information – memory block 0
**2** Date of manufacture
**3** Currency – memory block 0
**4** Reference data for software update
**5** Currency – memory block 1
**6** Coin information – memory block 1
**7** Device type
**8** Data block set number
**9** Nominal voltage
**10** Bar code
**11** Ordering code (8-digit), Order number (6-digit), Serial device number per order number (4-digit)
**12** Sorting chute
**13** no function
**14** Channel number – very narrow coin channel
**15** Channel number – narrow coin channel
**16** Channel number – normal coin channel
**17** Coin type

# 5 Function

This chapter describes how the coin validator works:

- Measuring principle and coin acceptance
- Coin channels
- Accepted coin sensor and sorting control
- Sorting accepted coins
- String recognition (optional)

## Measuring principle and coin acceptance

Coins inserted into the coin validator pass inductive and optical sensors which check the coins and there they generate individual measurement values. Due to the special design and arrangement of these sensors, each coin is checked for its material properties and dimensions. An upper limit and a lower limit are stored for each coin type, a so-called acceptance band, so that the coin validator knows whether to accept a coin or not. If the coin values measured are within the acceptance band, the coin is accepted when it has passed the accepted coin sensor and sorting control, but if they are outside the band, it is rejected and directed into the return area.

The limit values of the acceptance bands are programmed by the manufacturer according to the customers' specifications, but can be adjusted with the WinEMP PC configuration software or PalmEMP.

## Coin channels

The coin validator has 16 "memory slots" for coin acceptance which can be assigned up to 16 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.

In order to reject false coins reliably, channels with a narrow or even very narrow acceptance band are often set up for a coin type, in addition to the normal coin channel. The limit values of these coin channels are closer to one another so that false coins with similar measured values are rejected. However, narrow coin channels reject genuine coins more frequently.

In addition, it is possible to allocate coins with different measured values but identical coin values to different coin channels. In this way the coin validator can, for example, accept old and new coins of one 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 or sorting information (see section "Label" in Chap. 4 "Design").

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 further information desired at any time using the WinEMP PC configuration software or PalmEMP. Existing configurations can be changed.

The last three coin channels 14 to 16 are intended for teach mode. In these coin channels new coin types can also be taught without configuration software, directly on the machine using the switching block; i.e. a coin channel is assigned a coin type or also a token (see section "Teach mode (optional)" in Chap. 7 "Operation").

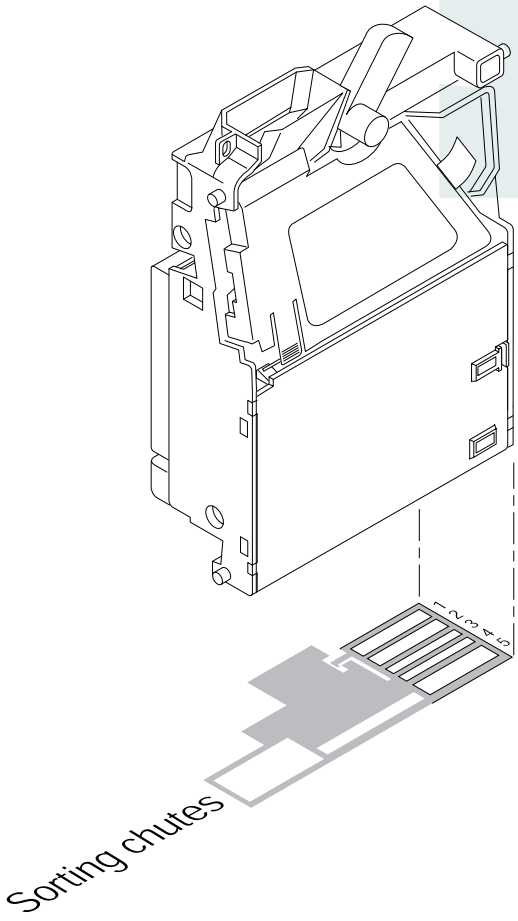
## Accepted coin sensor and sorting control

To ensure that accepted coins actually arrive in the cash-box or sorting device and that the acceptance has not been tampered with, an accepted coin sensor (light barrier) and sorting control (light barrier) check whether the inserted coin drops unhindered through the coin outlet in the direction of the cash-box or sorting device. Only when the coin has passed these checking functions is the coin value sent to the machine.

## Sorting accepted coins

In order to guide the accepted coins into either the cash-box or an external sorting device, such as change tubes or hoppers, the coin validator is equipped with five sorting chutes at the coin outlet. The chutes are controlled via a flap sorting system constructed using three solenoids. The individual coin types can be distributed across the five chutes independently of their size. Each chute can be defined as a cash-box chute.

Which coin type is to be sorted into which of the five chutes that are arranged one behind the other, is programmed by the manufacturer according to the customers' specifications. This, however, can be changed with the help of the WinEMP PC configuration software or PalmEMP. Information regarding the manufacturer's programming can be found on the label (see section "Label" in Chap. 4 "Design").




*The sorting function can be defined at will from the vending machine control using the S1 protocol.*

## String recognition (optional)

To ensure that coins which are suspended by a string are not accepted by the coin validator or to ensure that the coin acceptance cannot be manipulated, the coin validator is equipped with an optical sensor in the acceptance area which recognizes both tight and loose strings.

If the sensor recognizes a piece of string, a fault code is sent to the machine and the coin is not accepted. Coin acceptance is inhibited for a 30 second time period, other coins included. If the string is not removed within this time period and the sensor continues to recognize it, coin acceptance remains inhibited for a further 30 seconds.

# 6 Starting up

The G-40 S1 is either

- started up in a machine, or
- connected for configuration of the device with the NRI software
  – WinEMP to a PC, or
  – PalmEMP to a Palm handheld for configuration in the machine.

## Starting up in the machine

**1** Disconnect the machine from the mains supply.

**2** Hang the coin validator in the machine using the lateral mounting studs **1** (see Fig. 4).

**3** Connect the coin validator to the machine using the 10-pole S1 interface **2** provided and the appropriate connecting cable (see Fig. 4).

**4** Reconnect the mains supply to the machine.

**Make sure the correct supply voltage is connected (see label).**

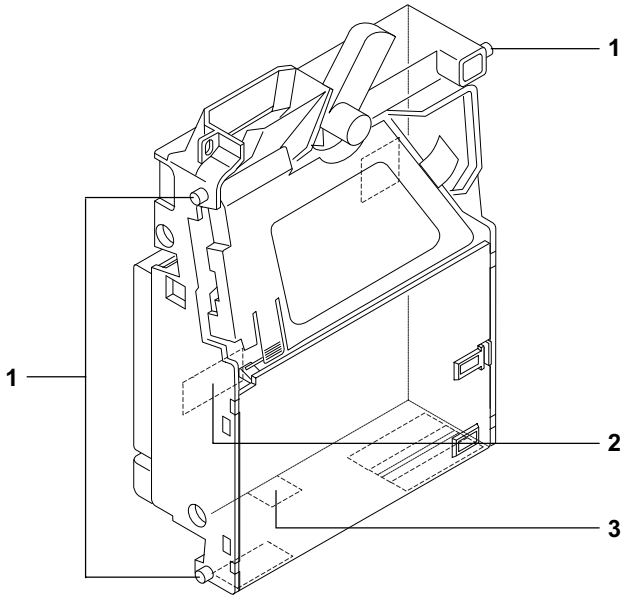



**Fig. 4:** Installation

## Device environment for the configuration software WinEMP

If you wish the G-40 S1 to be set on the PC using the diagnostics and configuration software WinEMP, the following device environment is connected to the S1 interface **2** of the coin validator (see Fig. 4 and section "Accessories" in Chap. 10 "Technical data"):

- Tester G-55.0338
- Connecting cable (coin validator – tester)

For details on how to connect the device environment to your PC and how to operate the software, please refer to the separate documentation for the WinEMP software (cp. also Chap. 9 "Which functions can be set using WinEMP/PalmEMP?").

## Connection to a Palm handheld (PalmEMP)

With a Palm handheld and the NRI software PalmEMP, the G-40 S1 can be configured on-site directly inside the machine. The PalmEMP program is available on the NRI homepage (www.nri.de). To be able to connect your Palm handheld to the coin validator, you need an NRI dongle (see section "Accessories" in Chap. 10 "Technical data"). An extension cable (for the mains supply of the coin validator only) is included in the delivery.

Should you wish the memory blocks of the G-40 S1 to be updated and for this a data block download to be performed, a WinEMP licence with PalmEMP download rights must be additionally ordered (see above and the section "Accessories" in Chap. 10 "Technical data"). Having done this, the new data blocks can be loaded initially into the Palm handheld, using WinEMP from your PC's internal hard disk, then from the Palm handheld into the coin validator.

For details on how to connect the Palm handheld to the PCB direct plug **3** and install and operate PalmEMP, please refer to the separate operating instructions for the software (cp. also Chap. 9 "Which functions can be set using WinEMP/PalmEMP?").

# 7 Operation

In this chapter you will learn how to

- select memory block 0 or 1
- teach new coin types or tokens in the coin channels 14, 15 or 16 by using the switching block on the rear of the device

## Select memory block

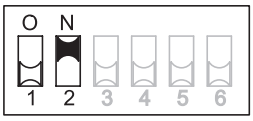
The G-40 S1 can data-manage two separately configured (memory) blocks 0 and 1. Sixteen coin channels with different coin types (including currencies), sorting information, etc. are assigned to each block. The blocks are programmed by the manufacturer according to customer-specific requirements. Only one block is active at a time and can be used for the coin measurement and for further coin processing.

The desired memory block can be selected either from the vending machine via the serial data bus or using the coin validator. The switching block on the rear of the device is used to determine whether the vending machine or the coin validator is to select a memory block and is also used to determine which memory block is to be activated when the coin validator selects a memory block.

### Select memory block using vending machine

1 Unhook the coin validator from the machine.

2 Switch DIL switch S2 upwards to ON.



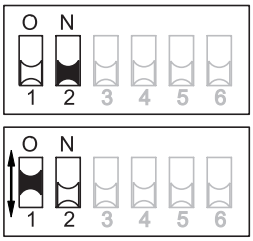

3 Hang the coin validator back in the machine.

4 Turn the power off and then on again.
The coin validator has now been set so that memory block 0 or 1 can be selected via the serial data bus.

### Select memory block on coin validator

1 Unhook the coin validator from the machine.

2 Switch DIL switch S2 downwards (to OFF). Memory block 0 or 1 can now be selected using DIL switch S1 on the coin validator.




3 For memory block 1, switch DIL switch S1 upwards to ON, and for memory block 0 downwards (to OFF).

4 Hang the coin validator back in the machine.

5 Turn the power off and then on again.
The desired memory block is activated.

# Teach mode (optional)

Coin channels can also be taught directly on the coin validator without the configuration software but with the use of the switching block, i.e. a coin type or a token is reassigned to a coin channel. Here, similar measured values are generated in the measurement area of the coin validator by inserting as many coins/tokens of one type as possible so that an upper and lower limit value (acceptance band) can be stored for a coin channel. This is also possible if the coin validator is installed in a machine. You can also widen the acceptance band for the selected coin channel so that the rejection of genuine coins is reduced. Coin channels 14–16 are available for teaching purposes.

*To be able to teach coin channels, the coin validator must be preprogrammed by the manufacturer.*

## DIL switches in teach mode

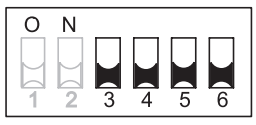
DIL switch

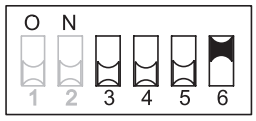
| | |
|---|---|
| S3 | Teach coin channel 14 |
| S4 | Teach coin channel 15 |
| S5 | Teach coin channel 16 |
| S6 | Teach mode ON |

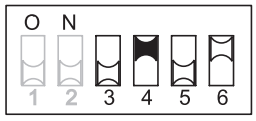
## Teaching new coin types in coin channels

To assign a coin type to coin channel 14, 15 or 16, please proceed as follows:

1. Unhook the coin validator from the machine.
2. Switch DIL switch S3–S6 downwards (to OFF).
3. Switch DIL switch S6 upwards to ON.
   The device is in teach mode for teaching the coin channels.
4. Release the coin channel to be taught (14–16, here: 15) by switching the appropriate DIL switch (S3–6, here: S4) upwards to ON.
5. Insert at least 10 coins of the new coin type/token into the coin validator.
   After the 10th coin has been inserted, an acoustic signal is emitted (acceptance gate is operated once, solenoid attraction sound). Further coins can be inserted to generate detailed measured values.

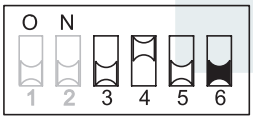


Now you can save the measured values generated by the inserted coins in either a normal (a) or a wide (b) acceptance band. By widening the acceptance band, the rejection of genuine coins is reduced but at the same time the acceptance of false coins is increased.

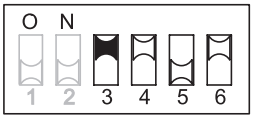
To save with the normal acceptance band:

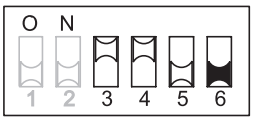



**6a)** Switch DIL switch S6 downwards (to OFF). Successful saving is signalled by the acceptance gate attracting once (solenoid attraction sound). An error when saving is indicated by the acceptance gate attracting twice, if, for example, the acceptance band of the coins inserted and the acceptance band of an already programmed coin channel overlap, or the measured values generated are too different and the tolerances would become too large.

*To cancel the process, first switch the DIL switch of the appropriate coin channel downwards to OFF position and then DIL switch S6, too.*

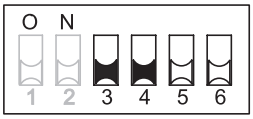
To save with a wide acceptance band:




**6b)** Switch a further DIL switch S3–S5 (here: S3) upwards to ON.
The acceptance band has been widened.
Now you can switch DIL switch S6 downwards to OFF.
Successful saving is signalled by the acceptance gate attracting once (solenoid attraction sound). An error when saving is indicated by the acceptance gate attracting twice, if, for example, the acceptance band of the coins inserted and the acceptance band of an already programmed coin channel overlap, or the measured values generated are too different and the tolerances would become too large.

*To cancel the process first switch the DIL switch of the appropriate coin channel as well as the DIL switch for the wide acceptance band downwards to OFF and then DIL switch S6, too.*




**7** Switch DIL switches S3–S5 (here: S4 and if necessary S3) downwards (to OFF).

**8** Hang the coin validator back in the machine.

**9** Turn the power off and then on again.

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

# 8 Maintenance and service

In this chapter you will out how to

- clean the G-40 S1, and
- remedy the cause of malfunction.

## Cleaning coin validator

Only the coin validator's flight deck must be wiped clean from time to time with damp cloth (luke warm water with some washing up liquid). Over and above there is no further maintenance work to do.

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

1. Pull the vending machine's mains plug.
2. Press lever **1** downwards and open the coin validator (Fig. 5).
3. Wipe the coin runway inside the coin validator clean.
4. Press "Close" arrow **2**, so that the metal spring engages behind lever **1**, in order to close the coin validator (Fig. 5).
5. Reconnect the vending machine to the mains supply.

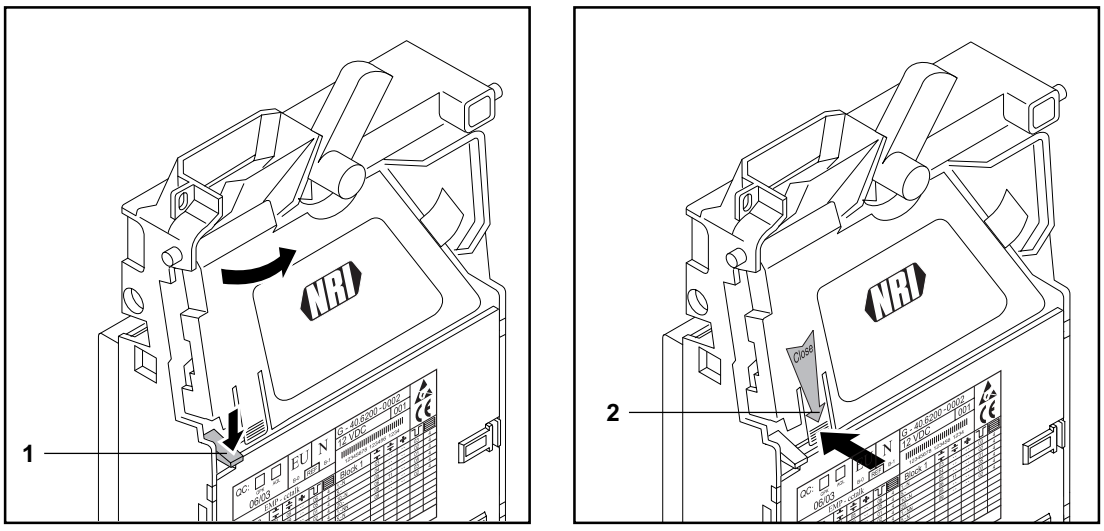



**Fig. 5:** Open up the coin validator flight deck and close

## 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 |
|---|---|---|
| Coin validator does not accept coin | No power supply | • Connect ribbon cable to validator and machine correctly<br>• Supply machine with voltage |
| | Return lever pressed/ got stuck | Make sure, that return lever is not inadvertently pressed |
| | Coin runway dirty | Open flight deck and clean coin runway (see section "Cleaning coin validator" in this chapter) |
| | Flight deck is not locked | Make sure, that spring is engaged behind lever(see section "Cleaning coin validator" in this chapter) |
| | Coin inhibited | Make sure, that machine control system does not inhibit coin acceptance |
| Coin validator 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 coin validator |

If the malfunction cannot be remedied, please contact our service technicians.

# 9 Which functions can be set using WinEMP/ PalmEMP?

The software WinEMP or PalmEMP is used to diagnose and configure NRI coin validators as well as to update the data block in the device memory.

**WinEMP** is PC software and part of a programming station for the workshop. For more information, please see the section "Accessories" in Chap. 10 "Technical data".

**PalmEMP** is software which can be stored on a Palm handheld as an additional application. If the Palm handheld is linked to the coin validator via a connecting cable with dongle, the G-40 S1 can be configured on-site directly in the machine.

Both programs identify the connected coin validator and the device's own data and present them on the screen of your PC or on the Palm handheld display.

The device functions listed below can be set using WinEMP/PalmEMP (see separate software instructions):

- Smallest coin value
- Decimal point position
- Assignment
  - Coin type – coin channel
  - Sorting chute – coin channel
- Acceptance band after insertion of
  - Genuine coins
  - False coins
- Teaching coin types/tokens in any coin channels
- Data block update for current coin information

*For the data block update, an additional module must be ordered in addition to the WinEMP software's basic module (see section "Accessories" in Chap. 10 "Technical data").*

*If you wish to perform data block updates using the Palm handheld, you need the WinEMP software with the PalmEMP download rights, which are stored on the WinEMP chip card (see section "Accessories" in Chap. 10 "Technical data").*

# 10 Technical data

| | |
|---|---|
| **Supply voltage** | 10 V to 28 V DC |
| **Current consumption** | |
| $U_{nom}$ = 12 V | Standby mode: approx. 40 mA<br>Measuring mode: approx. 65 mA (for approx. 220 ms)<br>Coin acceptance<br>... without sorting: approx. 350 mA (for approx. 30 ms)<br>approx. 130 mA (for approx. 90 ms)<br>... with sorting: approx. 600 mA max. |
| $U_{nom}$ = 24 V | Standby mode: approx. 40 mA<br>Measuring mode: approx. 65 mA (for approx. 220 ms)<br>Coin acceptance<br>... without sorting: approx. 310 mA (for approx. 30 ms)<br>approx. 120 mA (for approx. 90 ms)<br>... with sorting: approx. 550 mA max. |
| **Temperature range** | 0 °C to 60 °C |
| **Temperature change** | Max. 0.2 °C/min. |
| **Rel. humidity** | up to 93 % |
| **Condensation** | Not permitted |
| **Machine interface** | 9600 baud, 9-bit, N, 1, 1, 5 V TTL, Tx active low,<br>Rx active high<br>Protocol in compliance with "Interface Specification, Electronic Validator G-40 S1 serial", available on request;<br>For pin assignment see section "Pin assignment and conntection diagram" in this chapter |
| **Coin acceptance** | Max. 32 coin types in 2 x 16 channels<br>Coin diameter: 15–31 mm (optionally up to 32 mm, with thickness of max. 2.4 mm)<br>Coin thickness: 1.5–2.4 mm (optionally up to 3.4 mm)<br>Speed: 2 coins/sec. |
| **Device dimensions** | Height: 181.3 mm<br>Width: 127.0 mm (+ 2 x 4.5 mm for mounting studs)<br>Depth: 64.0 mm<br>(for mounting dimensions see section "Mounting dimensions" in this chapter) |
| **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 of conformity for our customers.

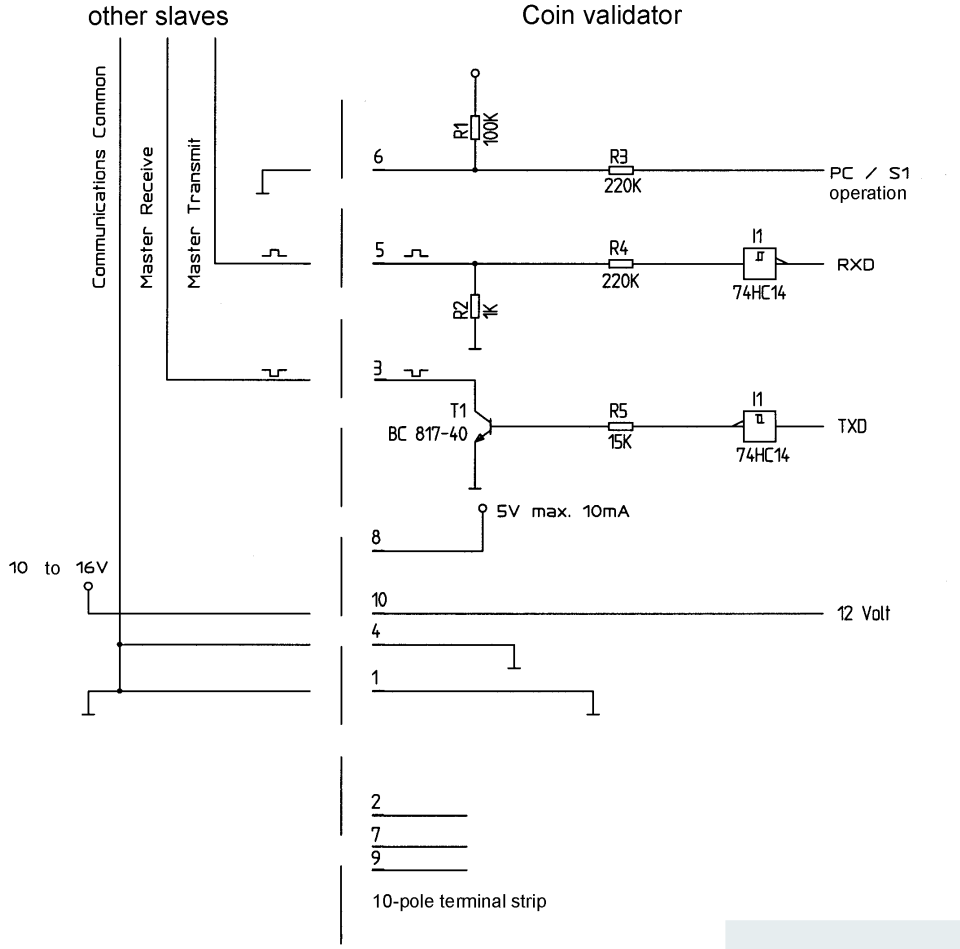
The following directives and their subsequent changes can be partially applied to our devices:

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 equipment which is 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.

## Pin assignment and connection diagram

| | |
|---|---|
| Pin 1 | 0 V supply |
| Pin 2 | not assigned |
| Pin 3 | Master receive |
| Pin 4 | 0 V supply |
| Pin 5 | Master transmit |
| Pin 6 | Switch line for WinEMP/PalmEMP software |
| Pin 7 | Reserved for wake-up line |
| Pin 8 | + 5 V ($I_{max}$ 10 mA) |
| Pin 9 | not assigned |
| Pin 10 | 12 V DC supply |

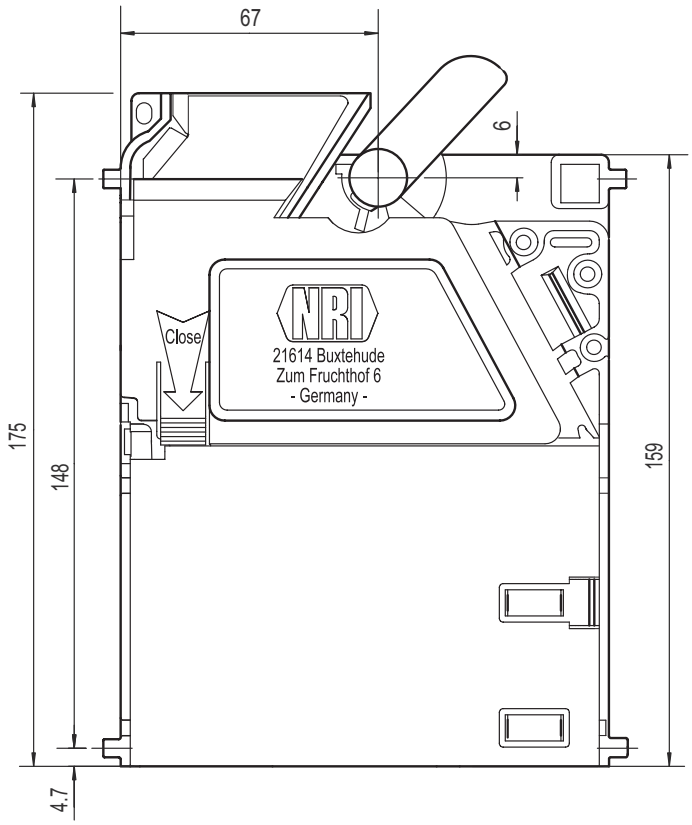
*You will find a detailed description of the serial S1 interface in the "Specification of the G-40.6800 S1", which is placed at your disposal by the company NRI upon your request.*



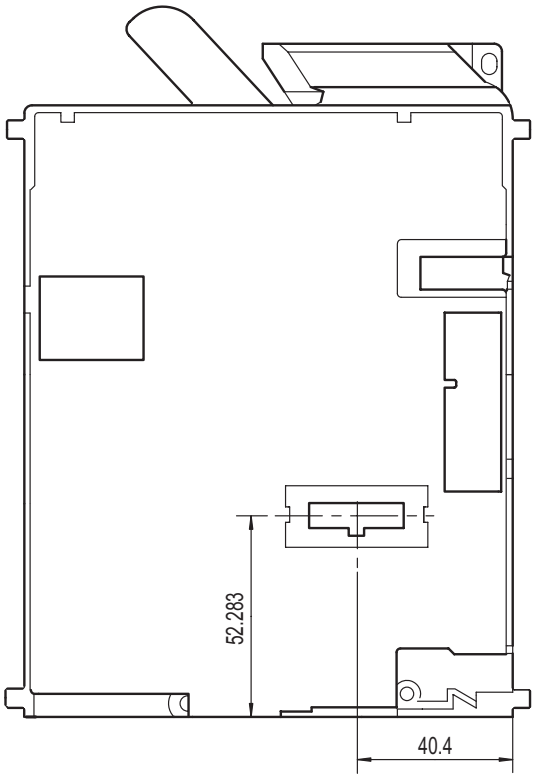
# Mounting dimensions

## Top entry model

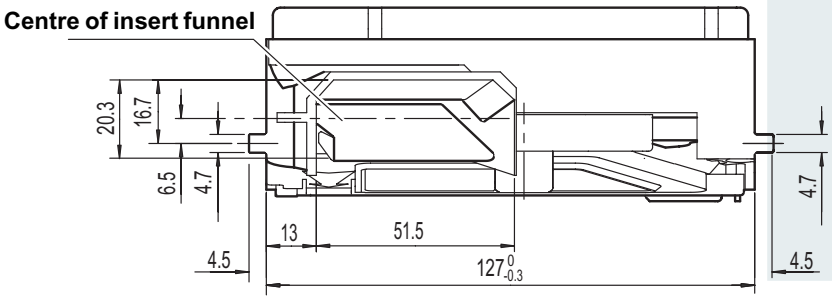
### View from front



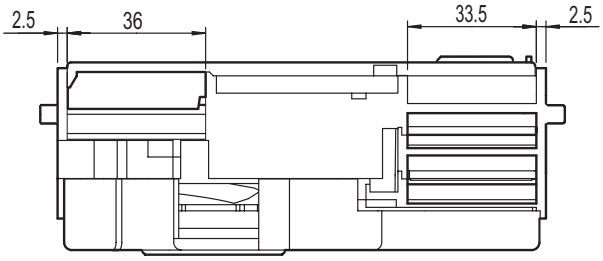

### View from rear



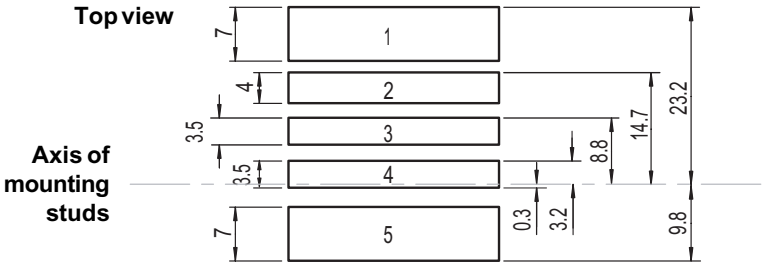
## View from above




## View from below

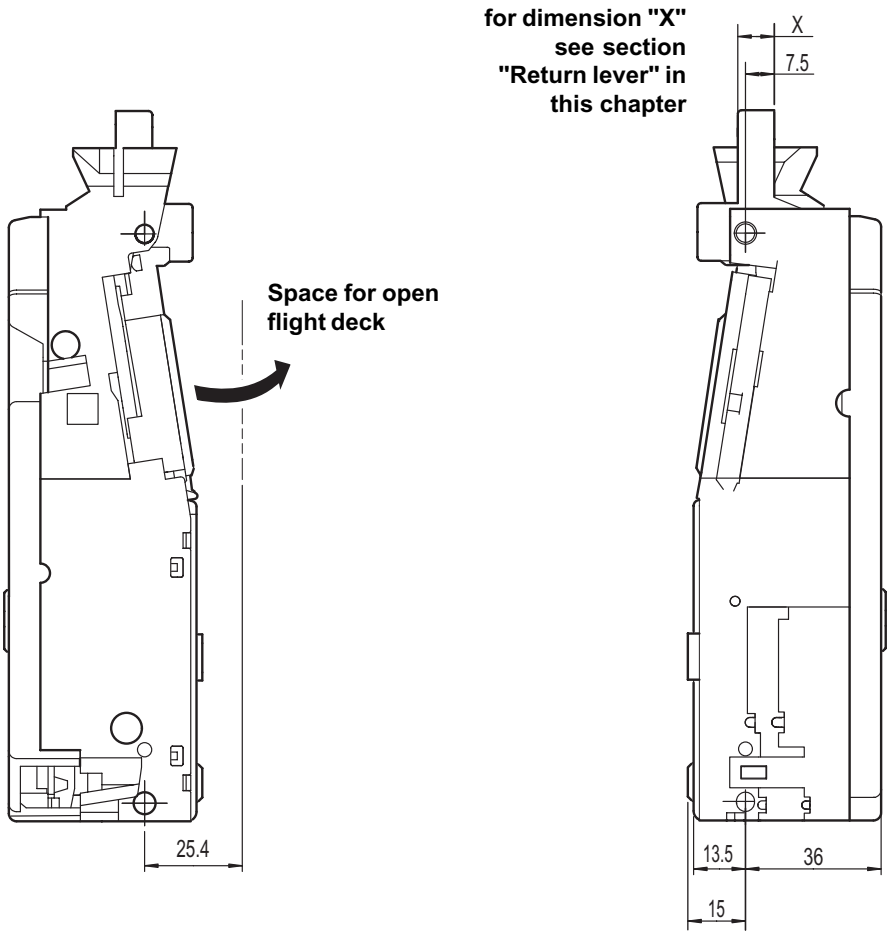



## Sorting chutes

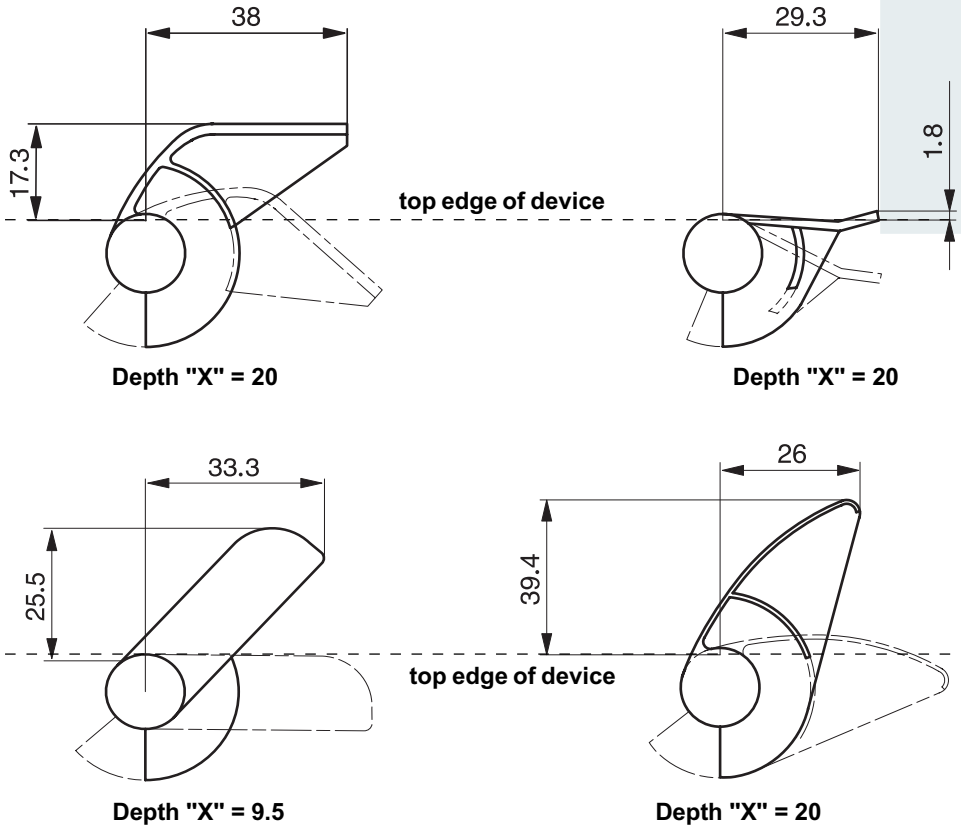



**Sorting chute 3 (standard: cash-box)**

## View from the side

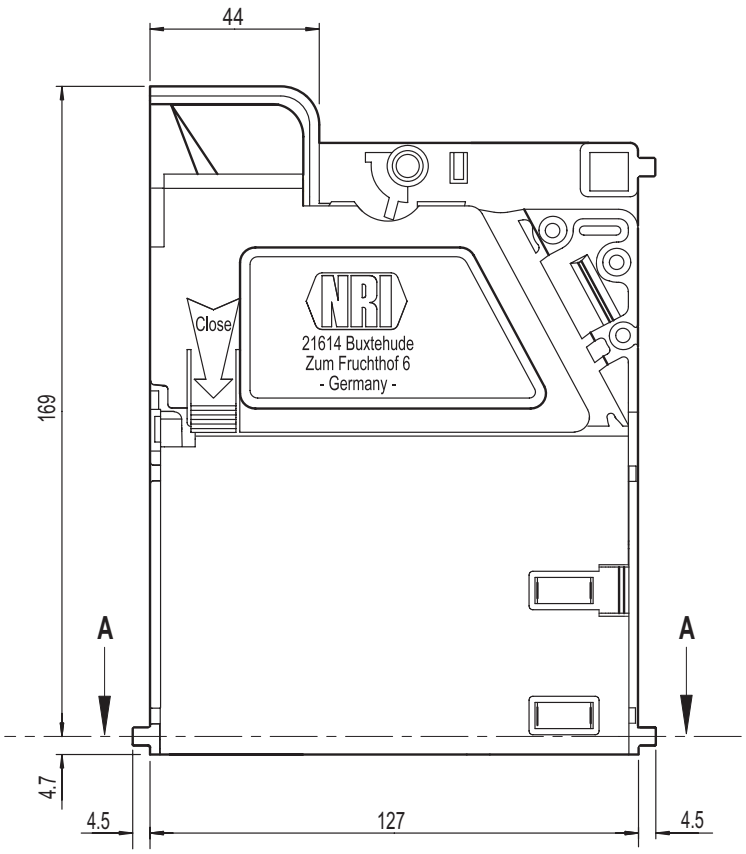


## Return levers

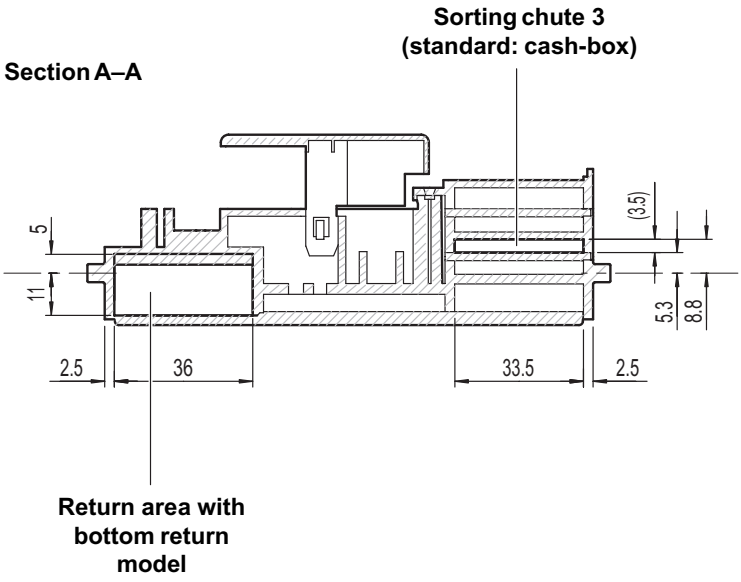


## Front entry model

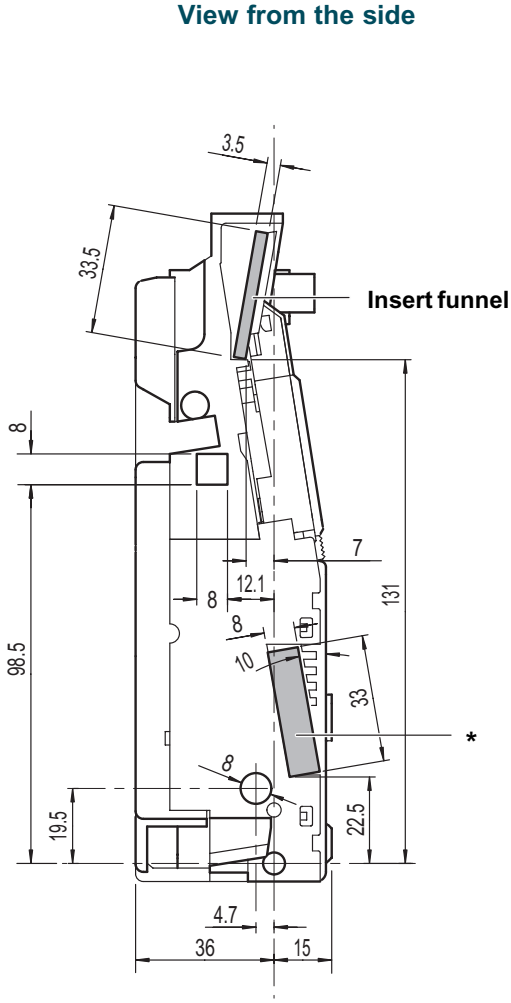
### View from front

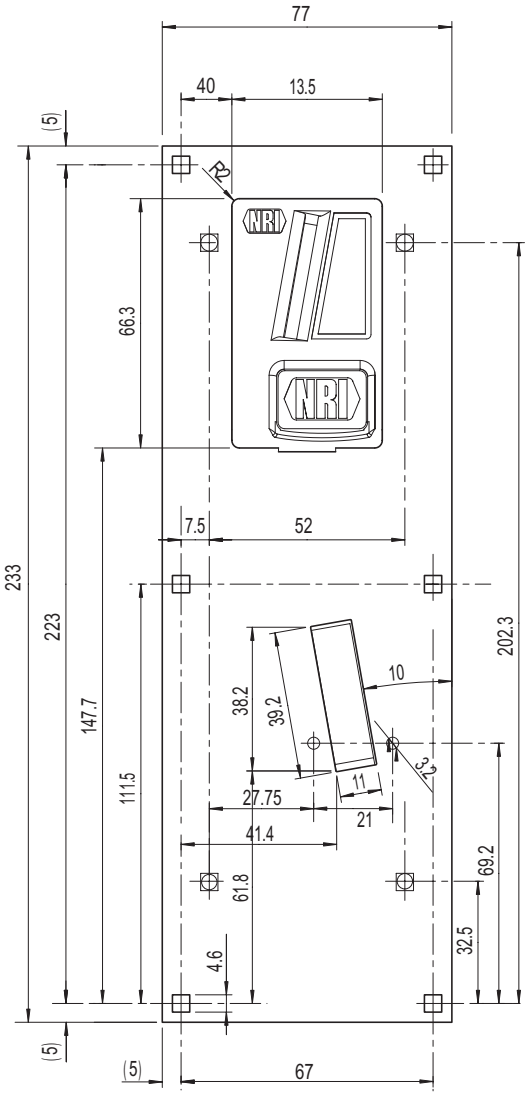


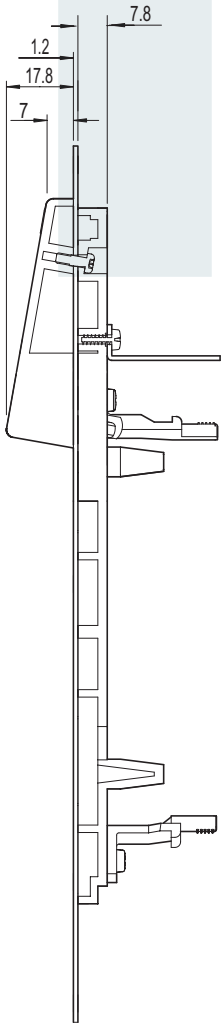

### View from below



## View from the side



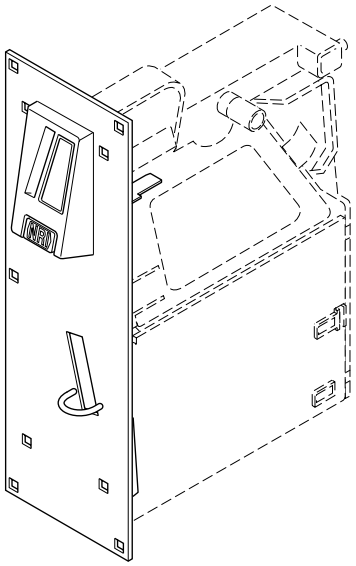

***Return area with front return model (this coin outlet of the bottom return model is closed by corresponding sorting cover)**

# Accessories

In order to test the coin validator or adapt it to your individual needs, you can acquire the following accessories from NRI:

## Front plates

For the G-40.78xx and the G-40.88xx two different front plates are available, which are fitted from the left-hand side of the coin validator, so that the cut-out in the machine wall provided for the installation is enclosed.

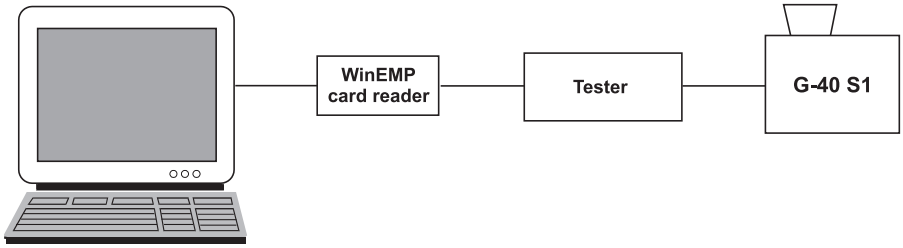


Coins are inserted into the device via the top slot in the front plate. Coins which are not accepted and are directed to the return area can either be returned via the bottom slot in the front plate G-42.4001 (ordering code: 10897, with coin stopper, see figure) or via the return area at the bottom of the device (front plate G-42.4002, ordering code: 12918, without coin stopper) (see Chap. 3 "Models").

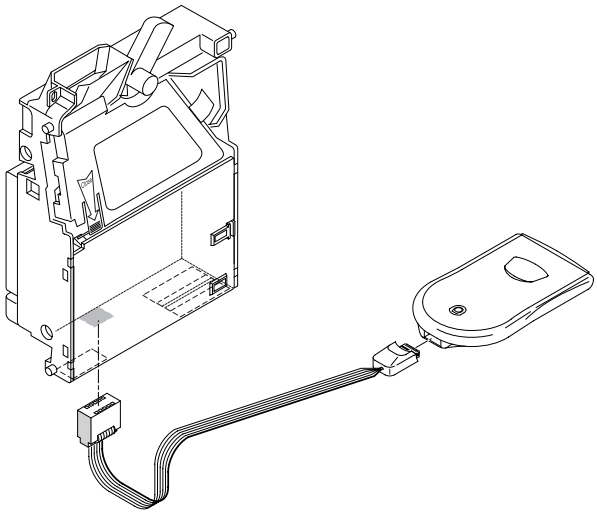
## Configuration software

To be able to react as quickly as possible to new false coins, in the workshop or on site, and enable you to make your individual adjustments, the coin validator can be connected to:

- The NRI PC programming station consisting of
  – Configuration and diagnostics software "WinEMP", including card reader und chip card (ordering code: 20119 for basic module and 23647 for additional module)
  – Tester G-55.0338 (ordering code: 15967)




- The NRI Palm application "PalmEMP", which is available on the NRI homepage (www.nri.de). To be able to connect a Palm handheld m125 to the coin validator, you need a dongle with the ordering code 23760; for an m105 a dongle with the ordering code 23761. If you wish to perform data block downloads with the help of a Palm handheld, you need the WinEMP software (see above) with PalmEMP download rights (ordering code: 23649), which are saved on the WinEMP chip card.



For details of which settings can be made with the help of WinEMP and PalmEMP, please see Chap. 9 "Which functions can be set using WinEMP/ PalmEMP?" For details on how to carry out these settings, please refer to the separate software instructions.

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# 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. Coins with these acceptable measured values are accepted.

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

**Acceptance limit** The upper and lower acceptance limit values define the → *acceptance band*.

**Accepted coin sensor** The accepted coin sensor is positioned in front of the coin outlet of the coin validator and checks whether accepted coins fall unhindered into the → *sorting chutes*.

**Block** → *Memory block*

**Change tubes** A payout set with up to 5 change tubes can be installed on the coin validator, into which up to five → *coin types* can be sorted. If necessary, these coins are directed back to the customer as change via the return area.

**Channel** → *Coin channel*

**Coin acceptance band** → *Acceptance band*

**Coin acceptance limit** → *Acceptance limit*

**Coin channel** A coin channel or its acceptance band is used to accept → *coin types* with the same → *coin properties*. A coin channel is assigned different functions, which describe how an accepted coin will be processed (coin value, sorting, etc.).

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

**Coin tube** → *Change tube*

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

**Coin value** The value of a → *coin type*, which the coin validator transmits to the vending machine.

**Data block update** When updating a data block set (2 data blocks) using WinEMP, the data blocks for the connected coin validator 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 sorting information.

**Hopper** Hoppers (coin storage) can be installed on the coin validator for sorting purposes, into which → *coin types* are collected. If necessary, these coins are then directed back to the customer as change via the return area.

**Memory block** Memory of the coin validator. Two (memory) blocks 0 and 1 can data-manage two independent configurations of → *coin channel* data. Each of these blocks has 16 individual → *coin channels* assigned to them with specific functions. A current → *data block* set can be loaded into the memory blocks.

**Sorting chute** To sort the accepted coins, individual → *coin types* can be sorted in 5 sorting chutes and therefore be directed into up to 5 → *change tubes* or → *hoppers*. The sorting chutes are on the bottom right-hand side of the device and can be defined as a cash-box chute.

**String sensor** The coin validator's sensor recognizes a coin inserted with a piece of string attached to it. The coin is not accepted for the selling operation.

**Switching block** The switching block is located on the rear of the coin validator and incorporates a number of DIL switches. A function is assigned to the individual switches (e.g. selecting → *memory block,* → *teach mode*).

**Teach mode** In optional teach mode, the → *coin channels* 14–16 can be assigned coin types or tokens on site at the machine, which means that these newly configured coins are accepted in the respective coin channel.

**Token** A token is inserted into the machine as payment instead of coins in a currency.

**Tubes** → *Change tubes*