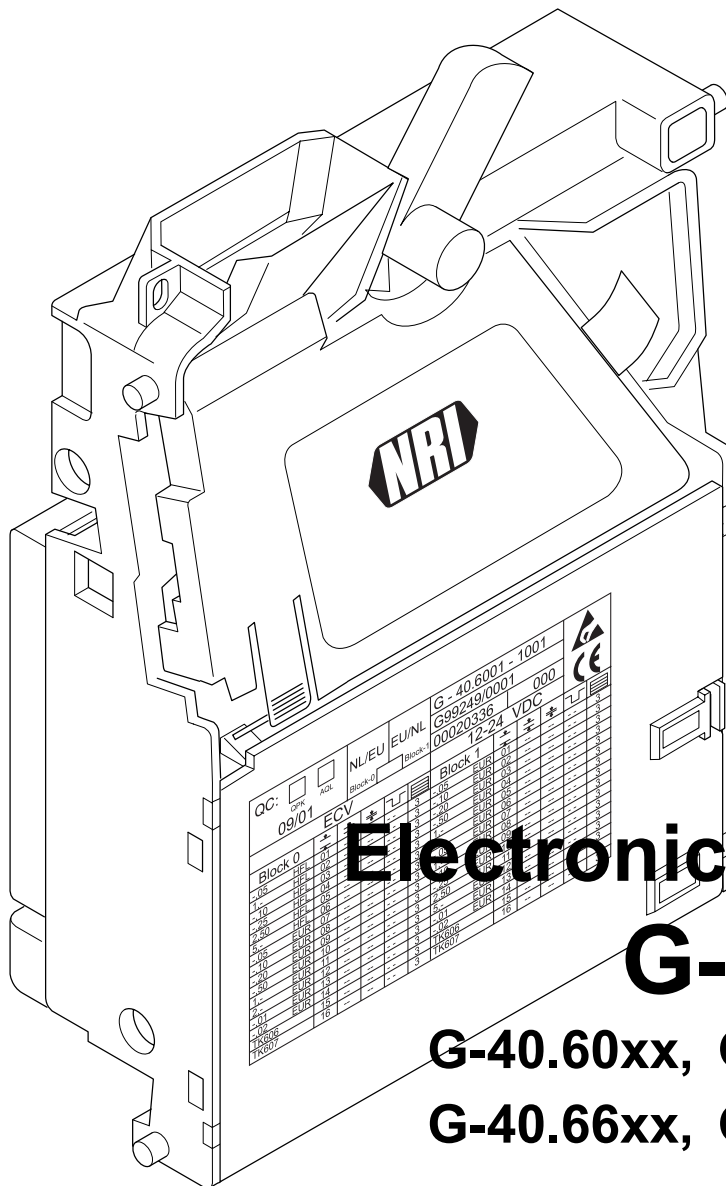




A Crane Co. Company



## Electronic coin validator G-40 FT BDTA

G-40.60xx, G-40.70xx, G-40.80xx

G-40.66xx, G-40.76xx, G-40.86xx

### Operating instructions

07.08 GS/ds  
Version 1.1  
BA.G40BDTA-EN



**CRANE**

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# 1 General information



This chapter should provide a general overview of the advantages and options regarding the coin validator with parallel interface G-40 BDTA. 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 BDTA with parallel BDTA standard interface. Chapters 5 und 6 explain the necessary steps for starting up and operating the coin validator. Chapter 7 explains how to clean the coin validator and remedy the cause of a malfunction.

Chap. 9 "Technical data" as well as 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.**



**Notes which you must observe in order to protect the environment.**



*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.

**[1/2]** Reference to a figure. The number before the slash refers to the figure number, the number behind the slash to the item number within the figure.



At the beginning of a chapter you will find a short "guide", which summarises the contents of the chapter.



Device functions, which are set or prepared by NRI according to customer specifications and can be set or changed using the NRI configuration software WinEMP (see Chap. 8 "WinEMP programming station for the workshop/WinEMP compact for on-site-configuration" and web pages for product accessories on the internet ([www.nri24.com](http://www.nri24.com))).

### Additional useful technical documentation

Apart from the operating instructions you already have there is further documentation for the G-40 BDTA, e.g., about spare parts, testing and configuration. All documentation is available in a compressed PDF format at [www.nri24.com](http://www.nri24.com) (→ Download).

## General information about the coin validator G-40 BDTA

The electronic coin validator G-40 BDTA with parallel standard interface in the standardized 5" format is based on the tried and tested features of the G-40.5xxx. The coin validator also communicates with the vending machine control system using a 16-pole connector. Due to its modular and compact design the G-40 BDTA is used in amusement, gaming, vending and service machines.

The G-40 BDTA mainly differs from its forerunner model in the flash technology (FT) enabling the customer to execute software downloads to adapt the measuring technology, coin data and control software quickly and simply.

The G-40 BDTA has 32 coin channels that are divided in 2 x 16 coin channels and datamanaged in two memory blocks with different coin configurations.

To be able to react as quickly as possible to new fraud coins and to enable you to make your individual adjustments, the 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-40 (see Chap. 8 "WinEMP programming station for the workshop/WinEMP compact for on-site configuration").

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



### The G-40 BDTA features

- Operating and manipulation safety thanks to optical accepted coin sensor and sorting control in coin validation area
- Acceptance speed of 2 coins per second
- 16 coin channels which can be blocked individually for each of the both memory blocks which have different configurations and can be selected depending on application area
- Acceptance of enabling tokens to identify vending machine user
- Optional 5-chute sorting
- Optional string sensor
- Optional teach mode for eight coin channels
- Top or front entry, front or bottom return
- Selection from four different return levers depending on vending machine type
- Interface for connection to WinEMP configuration software which makes immediate reaction to the use of fraud coins possible

### Scope of delivery

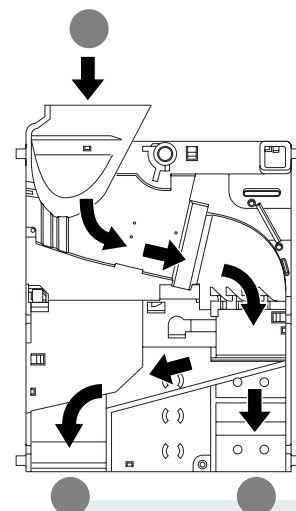
- Coin validator G-40 BDTA
- Parallel connecting cable to vending machine (tester) (16-pole)

### Models

The G-40 BDTA is available in different models. The difference is in where the coin insert area and the return area are positioned and if the coin validator is equipped with an internal 5-fold sorting mechanism or not.

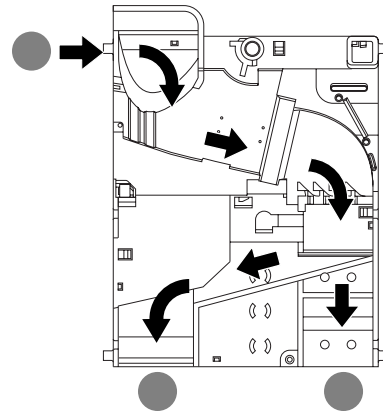
#### Top entry and bottom return (G-40.60xx/G-40.66xx)

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

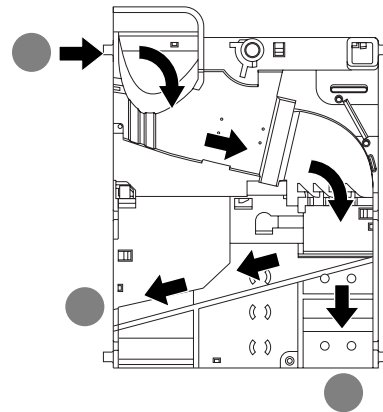


**Front entry and bottom return (G-40.70xx/G-40.76xx)**

With this model of the G-40 BDTA, 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 an NRI front plate fitted to the left-hand side of the device (see section "Accessories" in Chap. 9 "Technical data"). However, this model is also available without a front plate.

**Front entry and front return (G-40.80xx/G-40.86xx)**

With this model of the G-40 BDTA, 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 an NRI front plate fitted to the left-hand side of the device (see section "Accessories" in Chap. 9 "Technical data"). However, this model is also available without a front plate.

**Internal 5-fold sorting mechanism (G-40.66xx/G-40.76xx/G-40.86xx)**

In order to be able to sort the accepted coins into the cash-box or, e.g., into change tubes or hoppers, the G-40 BDTA is also available on an optional basis with an internal 5-fold sorting mechanism (see section "Sorting of accepted coins" in Chap. 4 "Function").

## 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 electronic coin validator G-40 BDTA is intended to be used in amusement, vending and service machines with a parallel BDTA interface and is supposed to check the coins inserted into the vending machine for specific properties. 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.

The coin validator has 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.

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

Ensure the correct potential equalization in the vending machine.

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

Pull out 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.

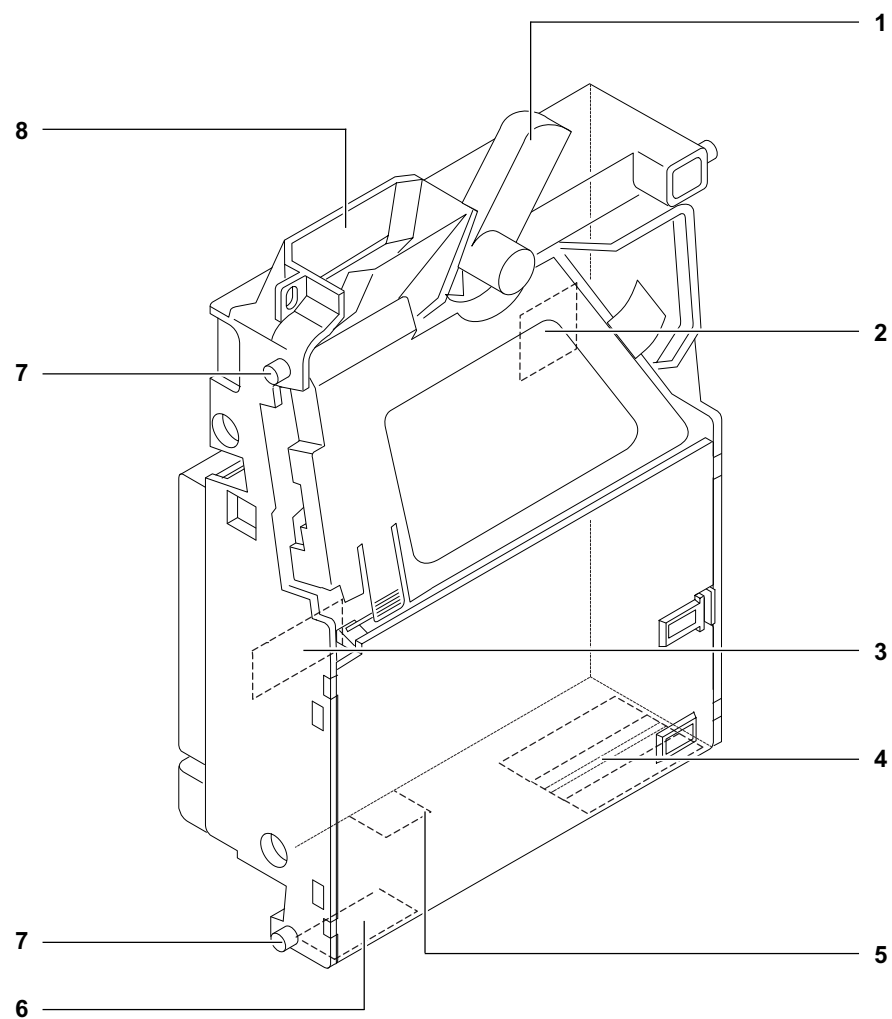
We reserve the right to make technical modifications to the device which are not covered by these instructions!

### 3 Design



This chapter describes

- the main parts the G-40 BDTA consists of, and
- all parts which you need to operate the coin validator.



**Fig. 1: Design**

- |  |   |
|--|---|
| 1 Return lever                                   | 6 Coin outlet – return area<br>(with bottom return model, for front return<br>model see section "Models" in Chap. 1<br>"General information") |
| 2 Switching blocks S1 and S2                     | 7 Mounting studs  |
| 3 Interface – vending machine/tester<br>(BDTA)   | 8 Coin insert funnel  |
| 4 Coin outlet – cash-box/sorting device          |   |
| 5 Interface – PC programming station<br>(WinEMP) |   |

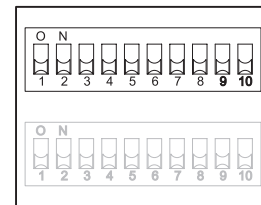
## Switching blocks

On the rear, the coin validator is equipped with two switching blocks with ten DIL switches S1.1–10 and S2.1–10 each. Using the DIL switches you can activate or deactivate certain device functions:

### Switching block S1

DIL switch		off	on
S1.1	Coin channel 1	accepts	inhibited
S1.2	Coin channel 2	accepts	inhibited
S1.3	Coin channel 3	accepts	inhibited
S1.4	Coin channel 4	accepts	inhibited
S1.5	Coin channel 5	accepts	inhibited
S1.6	Coin channel 6	accepts	inhibited
S1.7	Coin channel 7	accepts	inhibited
S1.8	Coin channel 8	accepts	inhibited
S1.9	Output configuration	A	B
S1.10	Memory block	0	1

S1



S2



### Switching block S2

DIL switch		off	on
S2.1	Coin channel 9	accepts	inhibited
S2.2	Coin channel 10	accepts	inhibited
S2.3	Coin channel 11	accepts	inhibited
S2.4	Coin channel 12	accepts	inhibited
S2.5	Coin channel 13	accepts	inhibited
S2.6	Coin channel 14	accepts	inhibited
S2.7	Coin channel 15	accepts	inhibited
S2.8	Coin channel 16	accepts	inhibited
S2.9	Mode	normal operation	teach mode
S2.10	no function		

S1



S2



For details on how to use the switching blocks to set the individual functions, see Chap. 6 "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 [1/1] on the top of the coin validator is operated using the return button on the vending 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.

The coin validator G-40 BDTA can be equipped, depending on the dimensions of the vending machine, with four different return levers (see section "Mounting dimensions" in Chap. 9 "Technical data").

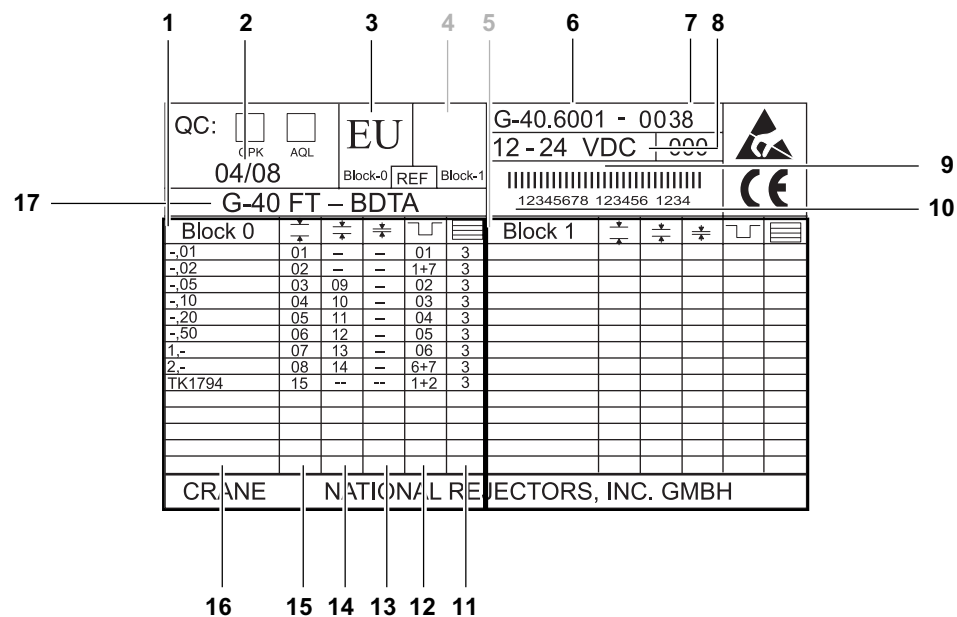
Devices with front entry through a front plate do not have a return lever. Here the measurement and validation area is opened by pressing the return button on the front plate.

## Interfaces


For details of the machine interface [1/3] please refer to Chap. 9 "Technical data".

## Label

The label 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 and appropriate channels, signal lines and sorting chutes:



**Fig. 2: Label**

- 1** Coin information – memory block 0  
(if DIL switch S1.10 switched to OFF)
- 2** Date of manufacture
- 3** Currency – memory block 0
- 4** Currency – memory block 1
- 5** Coin information – memory block 1  
(if DIL switch S1.10 switched to ON)
- 6** Device classification
- 7** Data block number
- 8** Nominal voltage
- 9** Bar code
- 10** Ordering code (8-digit),  
order number (6-digit),  
consecutive device number per order  
number (4-digit)
- 11** Sorting chute  – memory block 0  
(here: 3 = without internal sorting)
- 12** Coin signal line – memory block 0
- 13** Channel number, very narrow coin  
channel  $\frac{+}{-}$  – memory block 0
- 14** Channel number, narrow coin channel  
 $\frac{+}{-}$  – memory block 0
- 15** Channel number, normal coin channel  
 $\frac{+}{-}$  – memory block 0
- 16** Coin type – memory block 0  
(TK = Teach channels programmed for  
teach mode)
- 17** Device type



## 4 Function



This chapter describes the functional principle of the coin validator:

- Coin acceptance and coin channels
- Memory blocks
- Accepted coin sensor and sorting control
- Coin impulses and signal lines
- Coin inhibits/Activation of narrow coin channels
- Enabling tokens
- Sorting of accepted coins (optional)
- Teach mode (optional)
- String recognition (optional)

### Coin acceptance and coin channels

For the purpose of coin acceptance, the coin validator possesses 16 "memory slots" that 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.

To be able to reject fraud 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 fraud coins with similar measured values are rejected, if the normal coin channel is inhibited (see section "Inhibiting coin/Activating narrow coin channel" in Chap. 6 "Operation"). 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 coin validator 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. signal lines, coin impulse number or sorting information for a sorting device.



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 9 to 16 are intended to be used for the teach mode. In these coin channels new tokens/coin types can also be taught without configuration software, directly on the coin validator 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).

## Memory blocks

The G-40 BDTA data-manages two separately programmed (memory) blocks 0 and 1 (see label). In each block different coin types (also currencies), sorting information, etc. can be assigned to the 16 coin channels. 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 "Selecting memory block" in Chap. 6 "Operation").



*If required the memory block can also be loaded by the machine. For this NRI must program the coin validator so that the single inhibit line 6 (pin 4) can no longer be used to inhibit a coin channel but to switch the memory block. In this case coin line 1 (pin 13) is not only used for transferring coin impulses but also for responses following a block switch-over (see section "Selecting memory block" in Chap. 6 "Operation").*

## Accepted coin sensor and sorting control

To ensure that accepted coins actually arrive in the cash-box or in a sorting device and that coin acceptance has not been tampered with, an accepted coin sensor (light barrier) and a sorting control check whether the inserted coin drops unhindered through the coin outlet in the direction of the cash-box or sorting device. A signal is not transmitted to the vending machine until the coin has passed this checking function.

## Transfer of coin values by means of coin impulses and via coin signal lines

Usually, each coin accepted by the coin validator passes on one impulse to the vending machine control system on the coin signal line assigned to that coin. An impulse tells the vending machine control system that a coin has been accepted.

Depending on the coin signal line selected the machine knows what the coin type is (what coin value).



The assignment between coin type and coin signal line is customised by NRI.



*You can also assign a certain combination of signal lines, i.e. several signal lines, to a coin type in order to be able to differentiate.*

### Multiple impulses

If more coin types should be programmed than signal lines available, coin types can also be assigned several coin impulses (multiple impulses, max. 255) per coin so that the machine no longer differentiates by the signal line but by the impulse number. In such a case, coin types with a higher denomination are assigned a multiple of a smaller coin, i.e. if, for example, a 2 euro coin was inserted, the machine control unit would be sent two coin impulses on the coin signal line assigned to the 1 euro coin.



The number of coin impulses is customised by NRI.

By default the pulse-pause ratio is programmed with 1:1 but can also be programmed with a longer pause of 500ms.

### Coin impulse length

The coin impulse length is programmed to a standard value of 100ms. However, it can be programmed between 30 and 300ms upon customer request, e.g. shorter impulses for multiple impulses.

### Output configurations A and B for use in older and new vending machines

If the G-40 BDTA is not only used in older vending machines with few coin signal lines but also in new vending machines with sufficient coin signal lines, faulty allocation between coin type and coin signal line cannot be excluded (double allocation). To avoid double allocation, the device memory has two different output configurations A and B, which can be activated using the upper switching block depending on the area of application (see section "Selecting output configuration" in Chap. 6 "Operation").



In one configuration single impulses are programmed on the desired coin signal lines and in the other multiple impulses (max. 255). This guarantees clear allocation in each case.

## Coin inhibits/Activation of narrow coin channels

If coins are to be no longer accepted for payment at the machine, you can inhibit either

- the entire coin acceptance (common inhibit),
- all coin channels of a certain coin type, so that this coin is no longer be accepted or
- the normal coin channel of certain coin type, so that this coin is only accepted in the narrow channel.

### External common inhibit

The machine can inhibit coin acceptance via the common inhibit signal line. The coin validator no longer accepts coins (see section "Interface (pin assignment and connection diagram)" in Chap. 9 "Technical data").

### External inhibit of single coin channels

As an alternative to individual inhibiting of certain coin types via the DIL switches of the coin validator the machine can inhibit coins or too wide coin channels via six single inhibit signal lines (see section "Interface (pin assignment and connection diagram)" in Chap. 9 "Technical data").



Which coin type or which coin channel is to be inhibited via which signal line is customised by NRI.



*If the two output configurations A and B are used, you can also specify two inhibit configurations (cp. also section "Output configurations A and B for use in older and new vending machines" in this chapter).*

### Internal inhibit of single coin types

As an alternative to individual inhibiting of certain coin types via the machine you can on site inhibit individual coin channels using the switching blocks on the coin validator (see section "Inhibiting coin/Activating narrow coin channel" in Chap. 6 "Operation").

## Enabling tokens

If a vending machine is only available to a specific circle of customers, a vending operation can be initiated by an enabling token which is only issued to selected customers. A number of enabling tokens are possible. Enabling tokens can be managed internally by the coin validator or externally by the vending machine.

In the case of internal management, coin acceptance is inhibited for all coins except for enabling tokens until an enabling token is inserted. The token inserted is saved until a vending operation is deemed to have been completed by the vending machine.



The coin validator can be programmed by NRI so that the token is accepted as a normal coin and sorted into the vending machine's cash-box or so that the token is transported into the return chute.

If the token is managed externally, the token merely transmits one coin impulse via the coin signal line assigned to it. Coin acceptance is controlled by the vending machine.



Management of the enabling token as well as token values are customised by NRI.



*If the coin channel assigned to the enabling token is inhibited (using DIL switch or signal line), the function "Enabling token" is inactivated.*

## Sorting of accepted coins (optional)

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 can be 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.

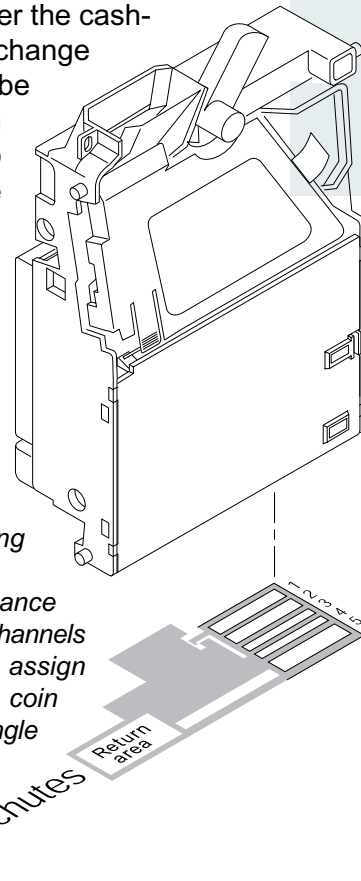


Which coin type is sorted into which of the five chutes that are arranged one behind the other, is customised by NRI (see label, section "Label" in Chap. 3 "Design").



*Use the single inhibit lines for controlling an external sorting device:*

*If the same coin with identical acceptance band is configured in two different coin channels (by NRI or with WinEMP), you can assign different sorting chutes to the both coin channels. If you now assign different single inhibit lines to both channels, the machine is able to use the single inhibit lines to sort the coin in one of the both sorting chutes.*



### Cash-box chute/Sorting chute override for external sorting control unit (optional)

If the machine control system is supposed to sort coins into the cash-box chute or a sorting chute override, if the external sorting device signals "Full", the coin validator can be programmed by NRI so that, depending on the active level of single inhibit line 6 (pin 4), the single inhibit lines 1–5 either inhibit coins (standard) (single inhibit line 6 = low, single inhibit lines 1–5 = high) or sort the coins assigned to the single inhibit lines into the cash-box (single inhibit line 6 = high, single inhibit lines 1–5 = high). Cp. section "Interface (pin assignment and connection diagram)" in Chap. 9 "Technical data".



#### Cash-box chute

The machine takes turns transmitting inhibiting and sorting information to the coin validator via the single inhibit lines, if no coin is accepted. The coin validator saves information whenever the signal is present for at least 10ms.



*If the cash-box chute is controlled using single inhibit line 6, you can only use five instead of six signal lines for coin acceptance and inhibits.*



## Teach mode (optional)

If the G-40 BDTA has been prepared at the factory accordingly, coin channels can be taught directly in the teach mode without configuration software via the lower switching block on the coin validator, i.e. a coin channel is reassigned a coin type or even a token. For this you do not need to remove the validator from the vending machine. For the teaching procedure, the last eight coin channels 9 to 16 of the activated memory block are available (see section "Teaching coin channels in the teach mode" in Chap. 6 "Operation").

## String recognition (optional)

To ensure that coins which are suspended by a string are not accepted by the coin validator and to ensure that the acceptance gate cannot be manipulated, the coin validator can be equipped with an optical sensor in the acceptance area which recognizes both tight and loose strings (not available for retro-fitting).

If the sensor recognises a string, coin signal line 1 or 6 transmits a string signal and the coin is not accepted. As a start coin acceptance is inhibited for 30 seconds. If the string is not removed within this period of time and the sensor continues to recognise it, coin acceptance remains inhibited and in addition, all "jammed coins" are released automatically.

Whether the string signal is transmitted via coin signal line 1 or 6 is customised by NRI (see section "Interface (pin assignment and connection diagram)" in Chap. 9 "Technical data").



### Sensibility of the string sensor



*If your coin validator operates in G-18 mode to control e.g. external sorting via the coin signal, manipulation protection is impaired as this requires a coin signal at the end of the coin acceptance signal.*

## 5 Start-up

For all installation work on the coin validator or the machine please observe the following safety instructions:



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

**The coin validator is not suited for outdoor use.**

**Do not use the coin validator if the device or connecting cable are damaged.**

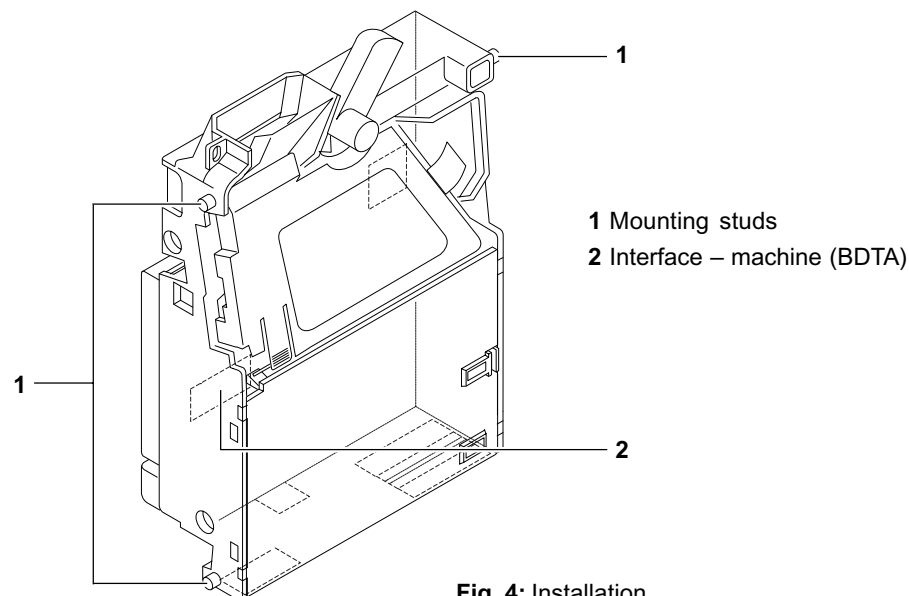
**Select the correct voltage for the coin validator (see label).**

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

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

To install the G-40 BDTA in a vending machine with parallel BDTA interface:

- 1** Disconnect the machine from the power supply.
- 2** Connect the validator to the machine using the 16-pole interface [4/2] and the appropriate connecting cable.
- 3** Hang the coin validator in the vending machine mount using the lateral mounting studs [4/1].
- 4** Reconnect the power supply to the machine.



**Fig. 4:** Installation

## 6 Operation



This chapter describes the operation, i.e. the setting of specific functions on the coin validator itself:

- Selecting memory block
- Selecting output configuration
- Inhibiting coin/Activating narrow coin channel
- Teaching coin channels in the teach mode (optional)

The settings that are performed directly on the validator are described. To find out how to perform settings using the configuration software WinEMP, please refer to the separate instructions (cp. also Chap. 8 "WinEMP programming station for the workshop/WinEMP compact for on-site configuration" and web pages for product accessories on the internet ([www.nri24.com](http://www.nri24.com))).

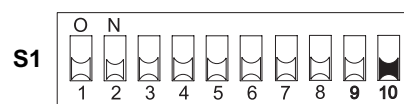
Chapter 4 "Function" describes the function of the adjustable device options.

### Selecting memory block ...

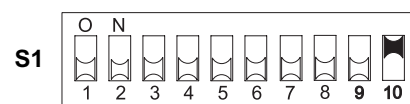
If the coin validator is to access the other memory block and, e.g., accept Euro coins instead of national currency coins, the correct block can be selected either using the upper switching block or by the machine using a signal line:

#### ... using switching block on the coin validator

- 1 Unhook the coin validator from the machine.
- 2 Set DIL switch S1.10 upward to ON to select memory block 1 or downward (to OFF) to select memory block 0.



Memory block 0 selected



Memory block 1 selected

- 3 Hang the coin validator back in the machine.
- 4 Turn the power off and then on again.  
The required memory block is activated.
- 5 Check coin acceptance of the new memory block selected.

### ... using machine control system (single inhibit line 6) (optional)

If the G-40 BDTA is programmed by NRI accordingly, the machine can load the relevant memory block:

- 1 Raise voltage level of single inhibit line 6 (pin 4) to High to select memory block 1 or drop it to Low for memory block 0.

The coin validator replies using coin line 1 (pin 13):

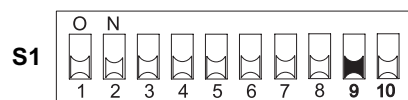
- 10-ms impulse = memory block 0
- 20-ms impulse = memory block 1
- 30-ms impulse = error

- 2 Check coin acceptance of the new memory block selected.

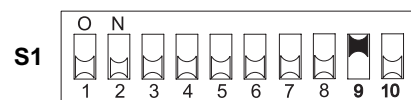
## Selecting output configuration

If the coin validator is used in another vending machine and coins are to be accepted or inhibited according to the other output configuration A or B, use the upper switching block to select the correct configuration:

- 1 Unhook the coin validator from the machine.
- 2 Set DIL switch S1.9 upward to ON to select output configuration B or downward (to OFF) to select output configuration A.



**Output configuration A selected**



**Output configuration B selected**

The required output configuration is activated.

- 3 Hang the coin validator back in the machine.
- 4 Check coin acceptance of the new output configuration.

## Inhibiting coin/Activating narrow coin channel

Using the two switching blocks on the coin validator each of the 16 coin channels of the activated memory block or each coin type assigned to specific coin channels can be inhibited on site, i.e. the inhibited coin channels will no longer be used for coin acceptance.

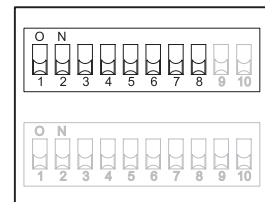
To activate a narrow coin channel the normal coin channel must be inhibited. If both channels are enabled, the wider acceptance band of the normal coin channel is used.

The 16 DIL switches inhibit the following coin channels:

### Switching block S1

DIL switch		off	on
S1.1	Coin channel 1	accepts	inhibited
S1.2	Coin channel 2	accepts	inhibited
S1.3	Coin channel 3	accepts	inhibited
S1.4	Coin channel 4	accepts	inhibited
S1.5	Coin channel 5	accepts	inhibited
S1.6	Coin channel 6	accepts	inhibited
S1.7	Coin channel 7	accepts	inhibited
S1.8	Coin channel 8	accepts	inhibited

S1

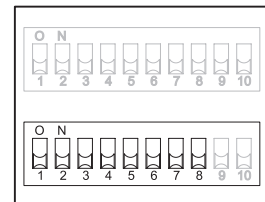


S2

### Switching block S2

DIL switch		off	on
S2.1	Coin channel 9	accepts	inhibited
S2.2	Coin channel 10	accepts	inhibited
S2.3	Coin channel 11	accepts	inhibited
S2.4	Coin channel 12	accepts	inhibited
S2.5	Coin channel 13	accepts	inhibited
S2.6	Coin channel 14	accepts	inhibited
S2.7	Coin channel 15	accepts	inhibited
S2.8	Coin channel 16	accepts	inhibited

S1



S2

Please refer to the label on the device to see which coin type has been assigned to which coin channel(s) by NRI.

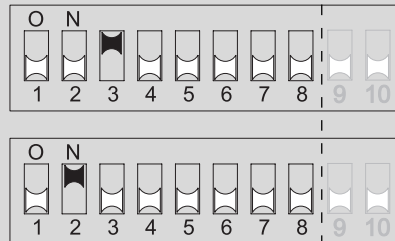


*However, this assignment could have been changed using the configuration software.*

If all coin types are to be accepted for payment at the vending machine unlimitedly, 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 coin validator 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 validator 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 validator 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 enabled, 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 validator:

- 1** Unhook the coin validator from the machine.
- 2** Inhibit the desired coin channels using the DIL switches S1.1–8 and S2.1–8 (cp. example above).  
The desired coin channels are inhibited.
- 3** Hang the coin validator back in the machine.

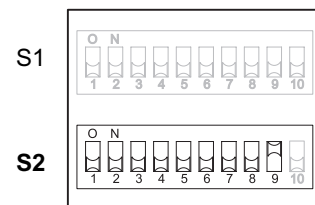
## Teaching coin channels in the teach mode (optional)

If the G-40 BDTA has been programmed at the factory accordingly, you can teach up to eight coin channels using the lower switching block on the coin validator in order to generate new acceptance bands. You will need at least ten coins/tokens of the new type.

The following DIL switches have the following functions:

### 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	off	on



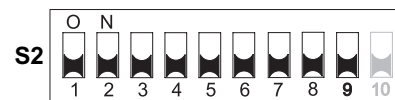
The eight teach channels are customised by NRI.

To re-assign a coin type to a coin channel of the active memory block, please proceed as follows:

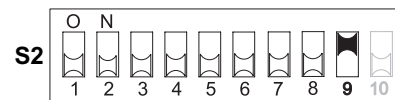


*Remember the current switch settings so that you can restore them for normal operation at the end.*

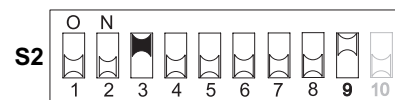
- 1 Set DIL switches S2.1–9 downward to OFF.



- 2 Set DIL switch S2.9 upward to ON. Now the device is in teach mode to teach the coin channels.



- 3 Release the coin channel to be taught (9–16, here: 11) 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 vending machine.

After the 10<sup>th</sup> coin has been inserted, the acceptance gate is operated once (brief clacking sound). Additional coins can be inserted.



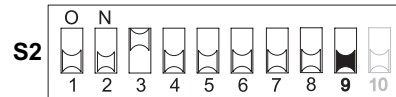
*If there is no signal after the 10<sup>th</sup> coin has been inserted, the coins inserted could not be used.*

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.

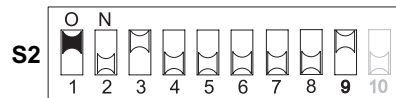
Successful saving is signalled by the acceptance gate attracting once, an error when saving is indicated by the acceptance gate attracting twice (brief clacking sounds), if, for example, the acceptance band of the coins inserted and the acceptance band of an already programmed coin channel overlap.



*To abort the operation, first set the DIL switch of the respective coin channel (S2.1–8, here: S2.3) and then DIL switch S2.9 toward the bottom to OFF.*

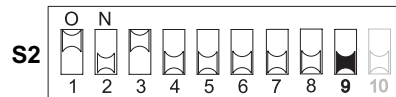
To save with a wide acceptance band:

- 5b)** Set an additional DIL switch S2.1–8 (here: S2.1) 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 sounds), if, for example, the acceptance band of the coins inserted and the acceptance band of an already programmed coin channel overlap.



*To abort the operation, first set the DIL switch of the respective coin channel (S2.1–8, here: S2.3) as well as DIL switch S2.1 and then DIL switch S2.9 toward the bottom to OFF.*

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

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



## 7 Maintenance and service



In this chapter you will find out how to

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



**Pull out the machine's mains plug before you clean or maintain the coin validator.**

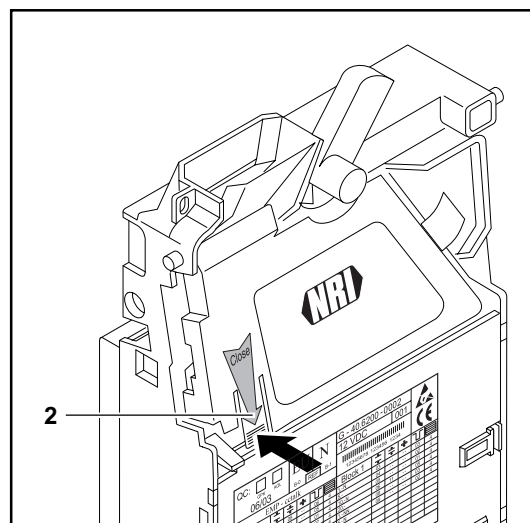
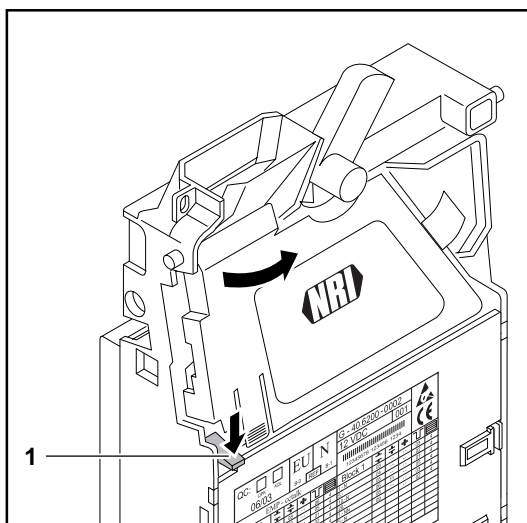
### Cleaning coin validator

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 [5/1] downwards and open the coin validator.
- 3 Wipe the coin runway inside the coin validator clean.
- 4 Press "Close" arrow [5/2] so that the metal spring engages behind lever [5/1] in order to close the coin validator.
- 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	<ul style="list-style-type: none"> <li>• Connect ribbon cable to coin validator and vending machine correctly</li> <li>• Supply vending machine with voltage</li> </ul>
	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	<ul style="list-style-type: none"> <li>• Make sure, that common inhibit line (pin 6) is not activated by vending machine (see section "Interface" in Chap. 9 "Technical data")</li> <li>• Make sure, that the single inhibit line assigned to the coin is not activated by the vending machine or the correct single inhibit line is assigned (if necessary, correct with WinEMP) (see section "Interface" in Chap. 9 "Technical data")</li> <li>• 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 "Inhibiting coin/Activating narrow coin channel" in Chap. 6 "Operation")</li> </ul>

Problem	Possible causes	Remedy, hints
	Enabling token programmed, but not yet inserted for coin acceptance	<ul style="list-style-type: none"> <li>• To make the validator accept other coins first of all insert enabling token</li> <li>• To test coin acceptance inhibit enabling token and enable it again after the test (see section "Inhibiting coin/Activating narrow coin channel" in Chap. 6 "Operation")</li> </ul>
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, you can use the NRI testers

- G-19.0594 (for power supply of 220/230 V, ordering code 11801)/
- G-19.0651 (for power supply of 110/115 V, ordering code 21410)

to test the signal lines.

To remedy other faults please contact our service technicians.

## 8 WinEMP programming station for the workshop/WinEMP compact for on-site configuration



This chapter provides general information concerning the WinEMP configuration software and the G-40 BDTA functions that can be configured with the help of this tool.

### Function

The PC software 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 current data blocks provided by NRI (data block download).

The WinEMP software identifies the coin validator connected to the PC and the device-own data and presents that data on the screen of your PC for diagnosis and configuration purposes.

### Composition

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

- WinEMP PC software
- Chip card (ID-1 format, credit card size) with basic licence for the purpose of diagnostics and individual configuration of all NRI coin validators
- Card reader "License Card Module"
- USB connecting cable card reader – PC
- Tester G-55.0359 as power supply unit and PC interface + power pack

**WinEMP compact** for on-site configuration consists of (see also product accessory pages on the internet ([www.nri24.com](http://www.nri24.com))):

- WinEMP PC software
- SimLock card reader "License Card Module" with integrated chip card (ID-000 format, SIM card size) with basic licence for the purpose of diagnostics and individual configuration of all NRI coin validators
- USB connecting cable card reader – laptop
- 12V power pack

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 set?

- Acceptance of genuine coins and rejection of fraud coins (acceptance band adjustment following the insertion of genuine coins and fraud coins)
- Coin value via assignment of coin channel to
  - coin signal line (if necessary for output configuration A and B)
  - coin impulse number (if necessary for output configuration A and B)
- Sorting via
  - assignment of coin channel to sorting chute
  - cash-box chute/sorting chute override for external sorting device
- Inhibit of coins via assignment of coin channel to single inhibit lines (if necessary for output configuration A and B)
- Enabling tokens
- String sensor sensitivity
- New coins/tokens (creating a new acceptance band and assigning the coin signal data)
- Data block download for current coin and device data

## 9 Technical data



This chapter provides information about

- all relevant G-40 BDTA data
- the CE certification
- the BDTA machine interface
- mounting dimensions
- ordering codes for the G-40 BDTA accessories

### Device data

**Supply voltage** 10V to 28V DC

#### Current consumption

$U_{nom} = 12V$

Standby mode:	approx. 40 mA
Measuring mode:	approx. 65 mA (for approx. 220 ms)
Coin acceptance	
... without sorting:	approx. 350 mA (for approx. 30 ms)
	approx. 130 mA (for approx. 90 ms)
... with sorting:	approx. 600 mA max.

$U_{nom} = 24V$

Standby mode:	approx. 40 mA
Measuring mode:	approx. 65 mA (for approx. 220 ms)
Coin acceptance	
... without sorting:	approx. 310 mA (for approx. 30 ms)
	approx. 120 mA (for approx. 90 ms)
... with sorting:	approx. 550 mA max.

**Electric strength** Max. 28V  
Inputs/outputs

**Current-carrying capacity** Max. 10mA (open collector)  
outputs

**Temperature range** 0°C to 60°C

**Temperature change** Max. 0.2°C/min.

**Rel. humidity** Up to 93 %

**Condensation** Not permitted

<b>Machine interface</b>	6 coin signal outputs (open collector) (active low $\leq 0.8V$ ) 6 single inhibit inputs (open collector) (active high $\geq 3.7V$ (acceptance $\leq 0.9V$ )) Common inhibit input (open collector) (active low $\leq 0.9V$ (acceptance $\geq 3.7V$ )) Return output (active low $\leq 0.8V$ at $I = 20mA$ ) For pin assignment see section "Interface (pin assignment and connection diagram)" in this chapter
<b>Coin acceptance</b>	Max. 32 coin types in 2 x 16 channels Coin diameter: 15–31mm (optionally up to 32mm, with thickness of max. 2.4mm) Coin thickness: 1.5–2.4mm (optionally up to 3.4mm) Speed: 2 coins/sec.
<b>Device dimensions</b>	Height: 181.3mm Width: 127.0mm (+ 2 x 4.5mm for mounting studs) Depth: 64.0mm (For mounting dimensions see section "Mounting dimensions" in this chapter)
<b>Mounting position</b>	Vertical, max. deviation: $\pm 2^\circ$
<b>Mark of conformity</b>	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.



## Interface (pin assignment and connection diagram)

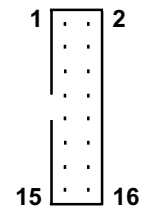


On the following pages you will find the interface description, connection diagram and pin assignments for connecting the G-40 BDTA to the vending machine.

### Pin assignment

The **Bundesverband der Deutschen Tabakwaren-Großhändler und Automatenaufsteller** (BDTA = German tobacco association) determined the DTG standard 2 for the electrical interface to the vending machine. This standard includes the specification of the supply voltage, the coin signal lines, inhibit functions and the return signal. In addition to further standardisation requirements for validators the measurement quality of validators is also specified.

Pin 1	IN	Single inhibit line 4: active high
Pin 2	IN	Single inhibit line 5: active high
Pin 3	IN	Single inhibit line 2: active high
Pin 4	IN	Single inhibit line 6/memory block 1 selection line/ cash-box chute sorting line: active high
Pin 5	OUT	Return line: active low
Pin 6	IN	Common inhibit line: active low
Pin 7	OUT	Coin line 4: active low
Pin 8	–	Ground (GND)
Pin 9	OUT	Coin line 6/string line: active low
Pin 10	OUT	Coin line 2: active low
Pin 11	OUT	Coin line 5: active low
Pin 12	OUT	Coin line 3: active low
Pin 13	OUT	Coin line 1/string line/memory block reply line: active low
Pin 14	IN	Single inhibit line 3: active high
Pin 15	IN	Single inhibit line 1: active high
Pin 16	–	Operating voltage $U_o = +10V-28V$ DC



*All signals must be debounced from the input side.*

## Interface description

### Coin lines

Coin validator signals coin accepted in the corresponding coin channel (usually with one impulse, if there are insufficient lines with multiple impulses)

### Return line

After the return button has been pressed, the coin validator signals the opening of the measurement and validation area

### Common inhibit line

Vending machine inhibits coin acceptance

### Single inhibit line

Vending machine inhibits coin assigned to the respective coin channel

### String line (optional)

Coin validator signals a coin suspended by a string (whether the signal is transmitted via pin 9 or 13, has been customised by NRI)

### Memory block 1 selection line (optional)

Vending machine loads memory block 1. (Memory block 0 = line to Low.)



*If this line function is programmed, single inhibit line 6 is not available.*

### Memory block reply line (optional)

Coin validator signals which memory block has been activated using memory block 1 selection line (10ms = block 0, 20ms = block 1) or if an error occurred when loading the memory block (30ms).



*If this line function is programmed, short impulse lengths should be specified for those coin signals transferred via coin line 1.*

### Cash-box chute sorting line (optional)

Vending machine signals that single inhibit lines 1–5 are used for sorting into cash-box chute.



*If this line function is programmed, single inhibit line and coin line 6 is not available.*

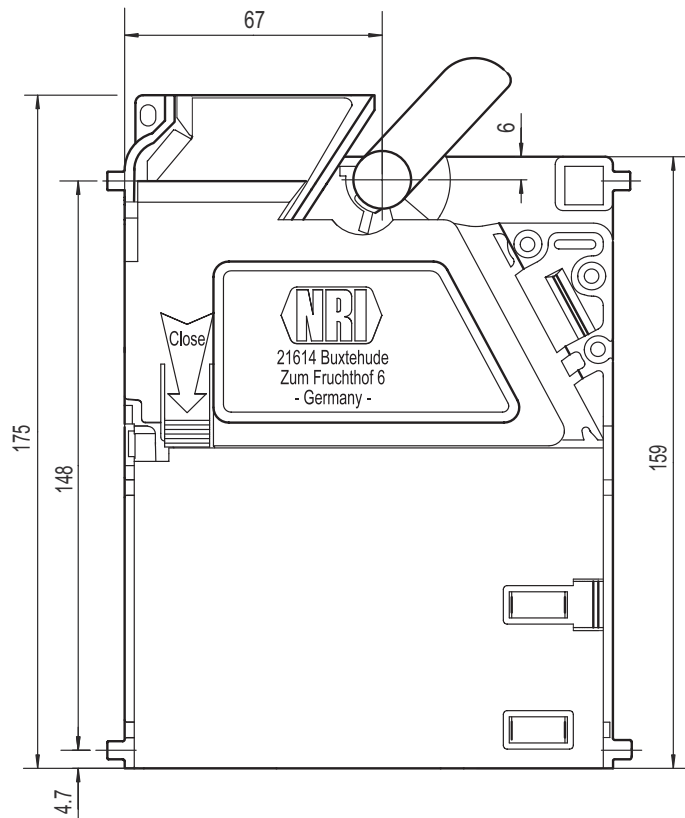
[illegible]

Line 1 is marked:  
by colour at the cable  
and by an arrow at the plug

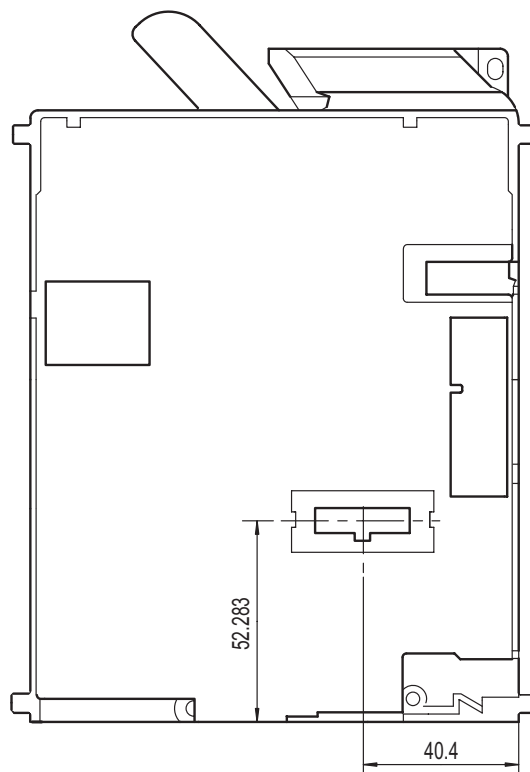
## Mounting dimensions

### Top entry model

#### View from front

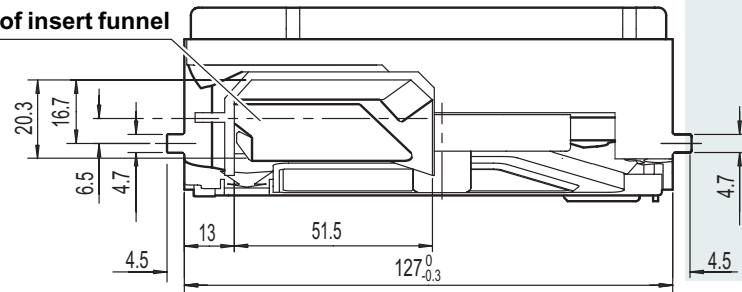


#### View from rear

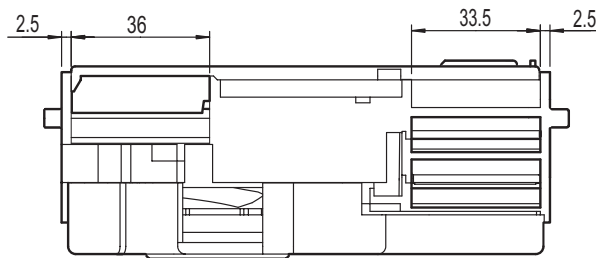


## View from above

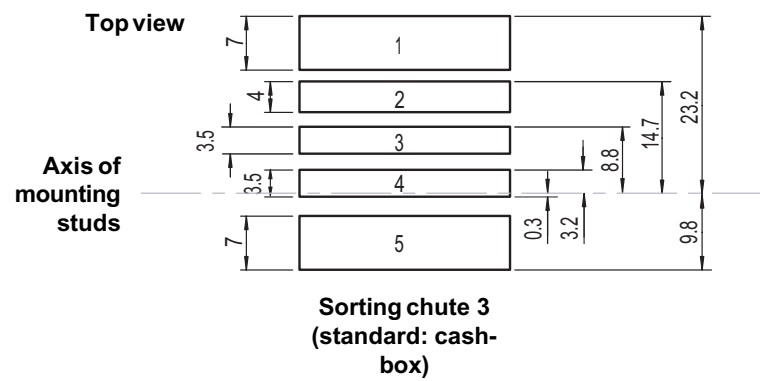
Centre of insert funnel



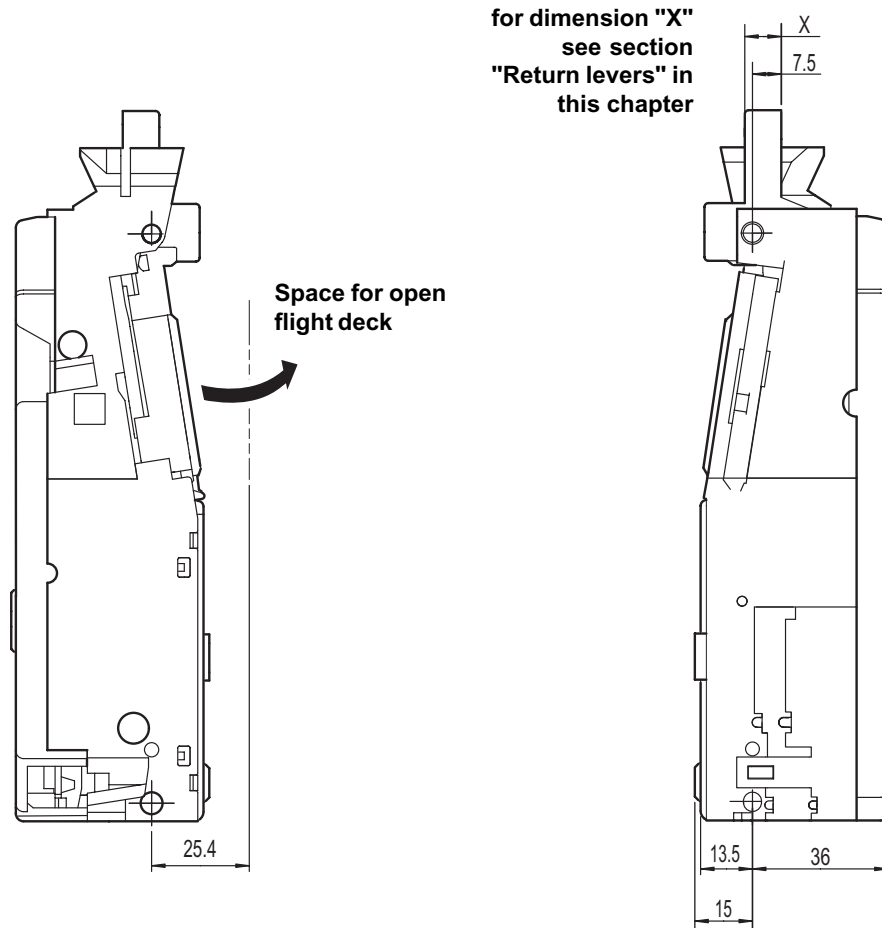
## View from below

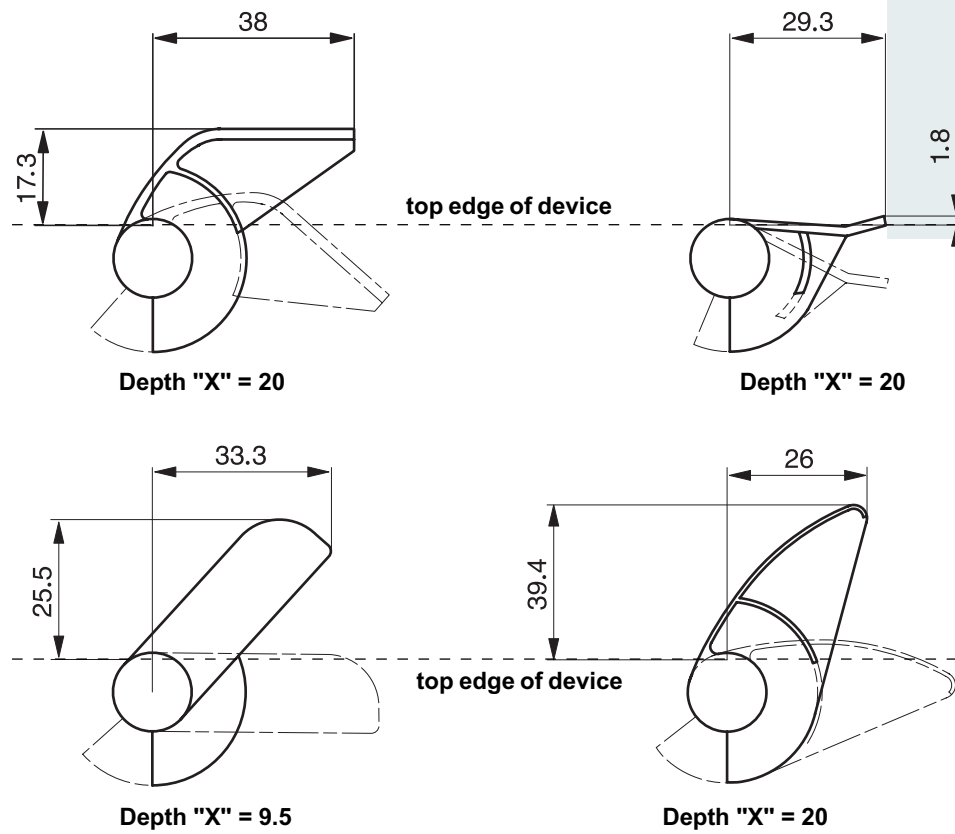


## Sorting chutes



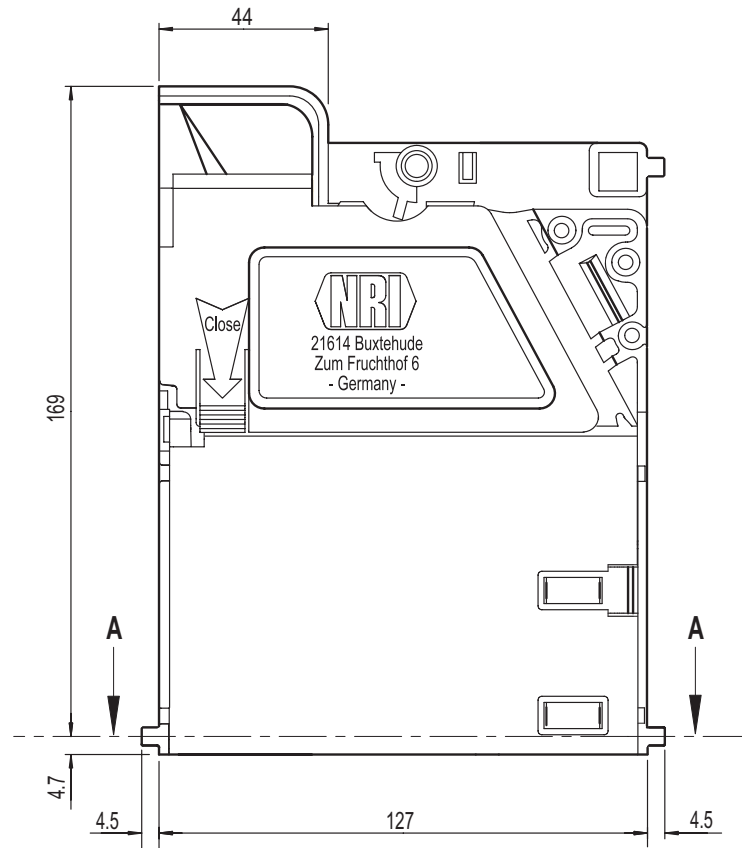
## View from the side



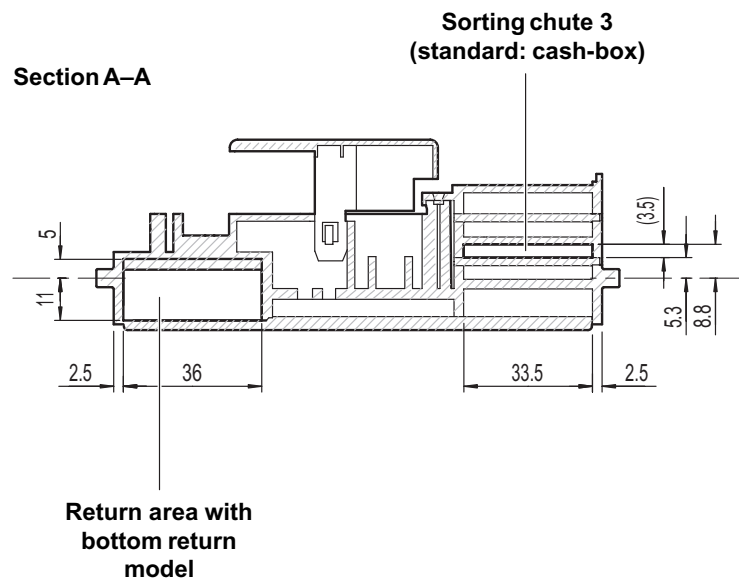
**Return levers**

## Front entry model

## View from front

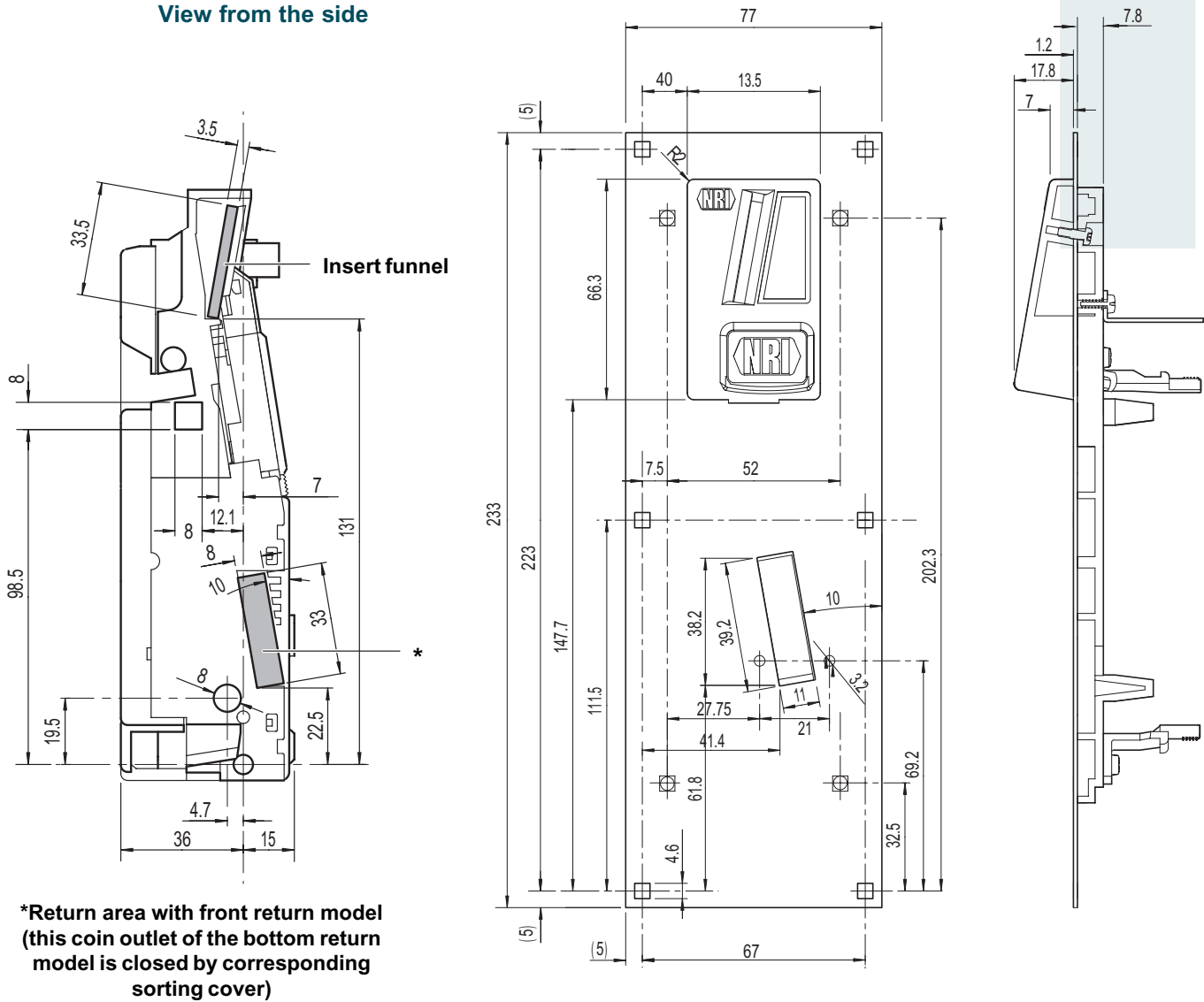


## View from below





## View from the side



Accessories

In order to test the G-40 BDTA or adapt it to your individual needs, you can acquire the following accessories from NRI:

Front plates

Accessories	Ordering code
Front plate G-42.4002 for front entry and ..... bottom return	12918
Front plate G-42.4001 for front entry and front return .....	10897

Tester

For all details regarding the NRI testers please refer to our web pages for the product accessories on the internet ([www.nri24.com](http://www.nri24.com)).

WinEMP PC programming station/WinEMP compact

For all details regarding the WinEMP configuration software please refer to our web pages for the product accessories on the internet ([www.nri24.com](http://www.nri24.com)).

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## Glossary

<b>Acceptance band</b>	A range of acceptable measured values of one → <i>coin type</i> (with specific → <i>coin properties</i> ) defined by an upper and lower limit value.
<b>Acceptance gate</b>	The acceptance gate diverts the inserted coins into the acceptance or return area of the coin validator.
<b>Accepted coin sensor</b>	The accepted coin sensor is positioned in front of the cash-box coin outlet of the coin validator and checks whether accepted coins fall unhindered into the cash-box chute.
<b>Block</b>	→ <i>Memory block</i>
<b>Channel</b>	→ <i>Coin channel</i>
<b>Coin acceptance band</b>	→ <i>Acceptance band</i>
<b>Coin channel</b>	Coin channels are used to describe → <i>coin types</i> using their different → <i>coin properties</i> (alloy, size, etc.). The required coin properties of a coin type are defined in → <i>acceptance bands</i> which are assigned to the coin channels, together with other coin information, for further processing.
<b>Coin properties</b>	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.
<b>Coin signal line</b>	The coin value of a → <i>coin type</i> is transmitted via coin signal lines.
<b>Coin type</b>	One coin type includes all coins for which the → <i>coin properties</i> agree.
<b>Common inhibit line</b>	Signal line from the vending machine control unit to the coin validator which can block acceptance of all coins.
<b>Data block download</b>	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 → <i>memory block 0</i> and <i>memory block 1</i> . The new data blocks contain different configurations of → <i>coin channel</i> data, e.g. current limit values of the → <i>acceptance bands</i> for a currency or new inhibiting or sorting information.

<b>ECV</b>	Electronic coin validator
<b>G-18 mode</b>	If the coin validator is in G-18 mode, the coin signal for e.g. to switch an external sorting is transmitted at the beginning of the coin acceptance signal (CP3). However, G-18 mode impairs manipulation protection when coins are inserted as this requires a coin signal at the end of the coin acceptance signal.
<b>Line</b>	→ <i>Coin signal line</i>
<b>Memory block</b>	Memory of the coin validator. The coin validator has two (memory) blocks 0 and 1 and thus can data-manage two independent configurations of coin/device data (e.g. two currencies). However, for coin validator operation, only one memory block with 16 → <i>coin channels</i> can be active at a time, the other block is inhibited. The memory blocks can be updated using WinEMP (→ <i>data block download</i> ).
<b>Output configuration</b>	The coin validator is able to data-manage two different output configurations A and B for each → <i>memory block</i> . In these output configurations → <i>coin channels</i> can be assigned different → <i>single inhibit</i> and → <i>coin signal lines</i> with coin impulses.
<b>Return line</b>	When the return lever 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.
<b>Single inhibit signal line</b>	Signal line from the vending machine control system to the coin validator which is used to block the acceptance of individual → <i>coin types</i> .
<b>Sorting gate</b>	The optional 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 sorting device.
<b>String sensor</b>	The coin validator's optional sensor recognises a coin inserted with a piece of string attached to it. The coin is not accepted for payment.
<b>String signal</b>	The → <i>string sensor</i> recognises a string and transmits a string signal to the control unit.



<b>Switching blocks</b>	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. inhibiting individual → <i>coin channels</i> .
<b>Teach mode</b>	In the optional teach mode, the last eight → <i>coin channels</i> can be assigned new → <i>coin types</i> or → <i>tokens</i> on site at the vending machine by inserting coins and without any configuration software, which means that these newly configured coins are accepted in the respective coin channel for payment.
<b>Token</b>	Tokens are accepted for payment at vending machines instead of coins in a currency.