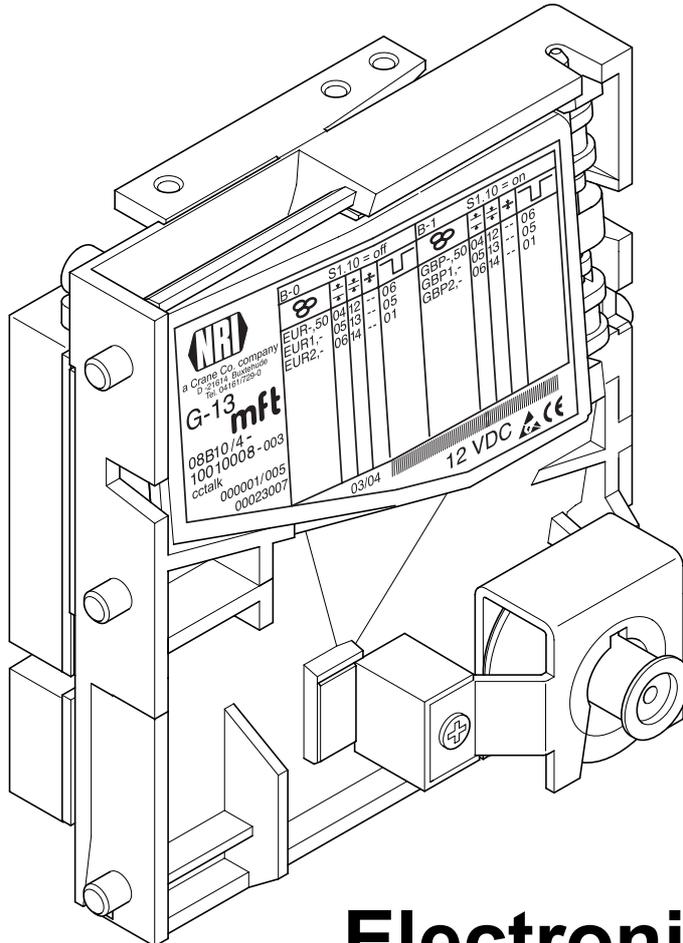




A Crane Co. Company



Electronic coin validator G-13.mft ccTalk (from model /4 on)

Operating instructions

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Edition 1.3
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1 General information

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

General information about these instructions

These operating instructions describe the design and operation of the electronic coin validator G-13.mft with ccTalk 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 shorten 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 have to be taken note of in order to protect operators and equipment.



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

1 2 3 ...

Requests to perform an action are numbered in another typeface.



At the beginning of a chapter you will find a short "guide", which summarizes the content of the chapter.



Device functions which are set or prepared by the manufacturer according to customer specifications and can be set or changed using the NRI PC programming station WinEMP (see Chap. 8 "WinEMP programming station for the workshop/WinEMP compact for on-site configuration" and product accessory pages on the internet (www.nri24.com)).

Additional technical documentation

Apart from these operating instructions there is the following technical documentation for the G-13.mft with ccTalk interface:

- Electronic coin validator G-13.mft, mounting dimensions
- WinEMP – The configuration and diagnostics program for NRI coin validators, operating instructions for the G-13.mft
- WinSPT – The test software for payment systems with serial interface, operating instructions for the PC test station



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

General information about the coin validator G-13.mft with ccTalk interface

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

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

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 configuration and diagnostics software "WinEMP" (including card reader and licence chip card) and an NRI tester for power supply of the G-13.mft.



To ensure that the injunctions of the Italian amusement machine law "legge 289 – comma 6" are observed, the ccTalk ACMI model of the G-13.mft is not allowed to be configured. Please contact NRI if you want to change the factory settings.

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

Models and operating modes

The G-13.mft with ccTalk interface is available as a standard model and as a ccTalk ACMI model. The latter model fulfils all requirements of the Italian amusement machine law "legge 289 – comma 6", which was passed in July 2003.



To ensure that the injunctions of the Italian amusement machine law are observed, subsequent configuration of the ccTalk ACMI model of the G-13.mft is not possible.

Please contact NRI if you want to change the factory settings.

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

Casino applications

You can operate the G-13.mft ccTalk in a so-called Casino mode if it is supposed to be used in gambling machines and coins have to be accepted particularly fast (up to 6 coins/sec.).

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

Series G-13.mft coin validators with ccTalk interface are intended to be used in amusement, vending and service machines with a ccTalk interface and are supposed to check the coins inserted in the machines for specific coin properties.

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.

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

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

Ensure the correct potential equalization in the machine.

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

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

Keep water and other liquids away from the coin validator.

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

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

3 Design



This chapter describes

- the main parts the G-13.mft consists of
- the coin route from insert funnel to cash-box/sorting chute or return area
- all parts which you need to operate the coin validator

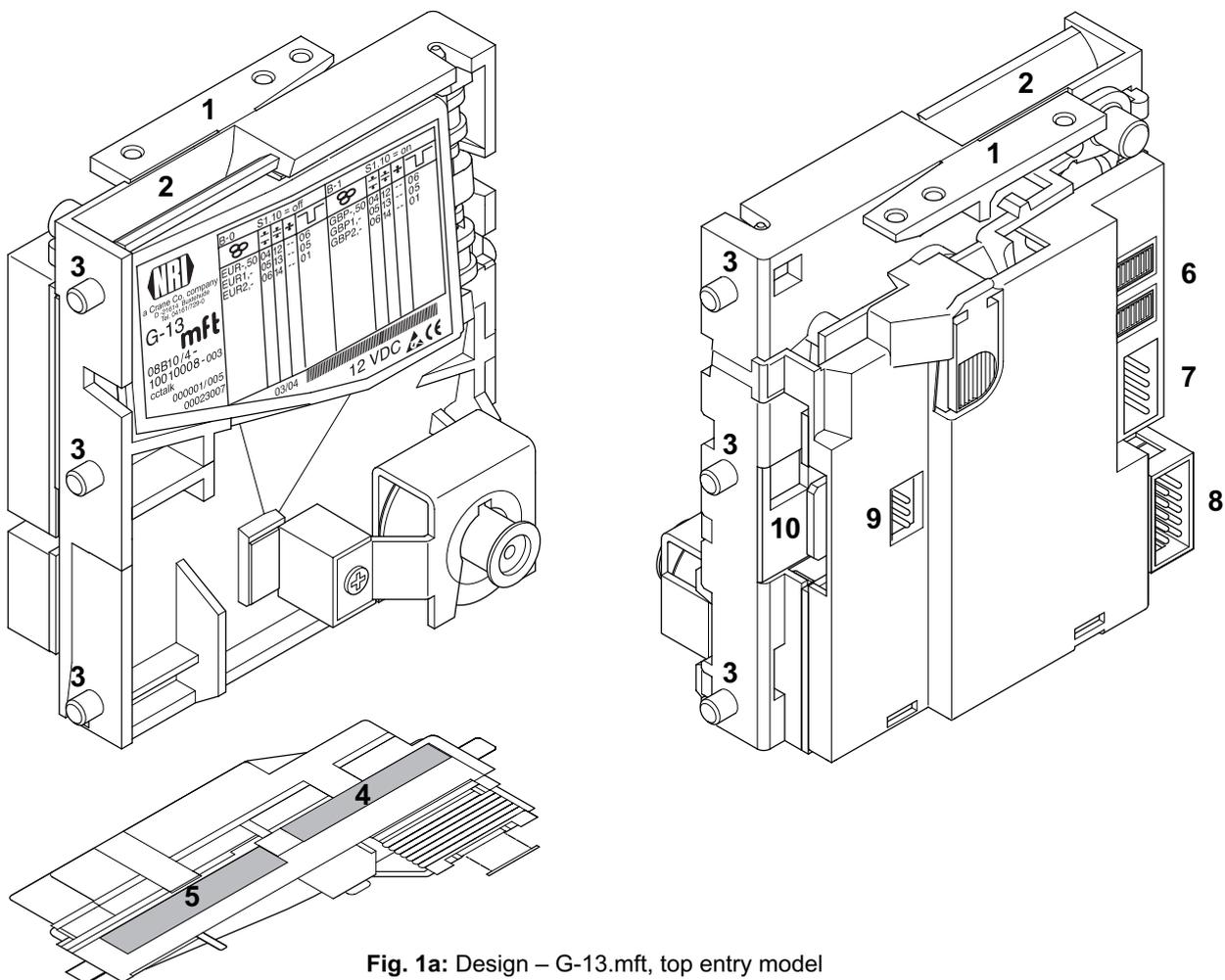


Fig. 1a: Design – G-13.mft, top entry model

- | | |
|-----------------------------|--|
| 1 Return lever | 7 ccTalk interface – machine |
| 2 Coin insert funnel | 8 Interface – external sorting device |
| 3 Mounting studs | 9 Interface – external sorting device for other protocols (not assigned) |
| 4 Coin outlet – return area | 10 Interface – PC programming station (WinEMP) |
| 5 Coin outlet – cash-box | |
| 6 Switching blocks | |

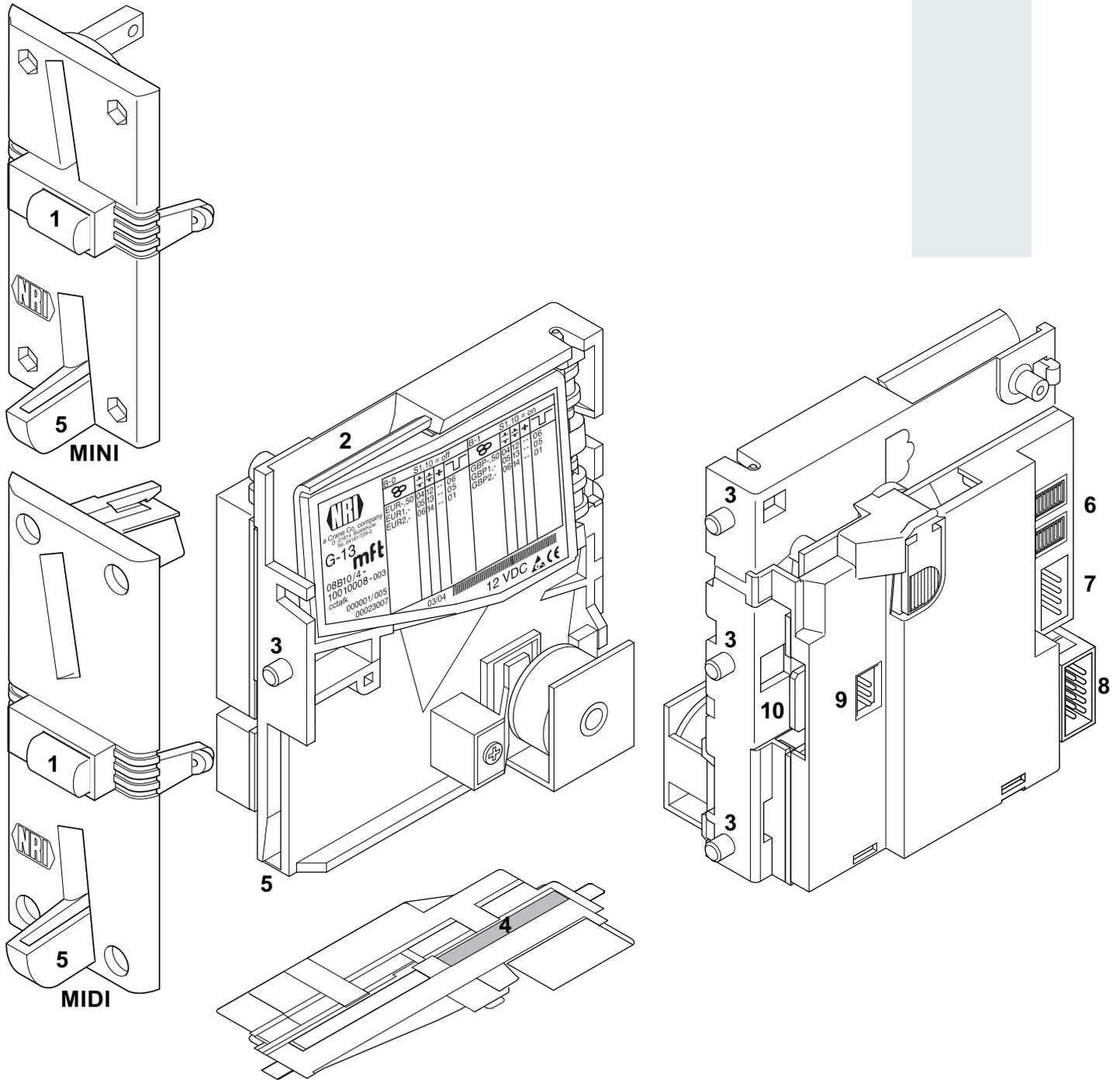


Fig. 1b: Design – G-13.mft, front entry model with front plate

- 1 Return button
- 2 Coin insert funnel
- 3 Mounting studs
- 4 Coin outlet – cash-box
- 5 Coin outlet – return area
- 6 Switching blocks
- 7 ccTalk interface – machine
- 8 Interface – external sorting device
- 9 Interface – external sorting device for other protocols (not assigned)
- 10 Interface – PC programming station (WinEMP)

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

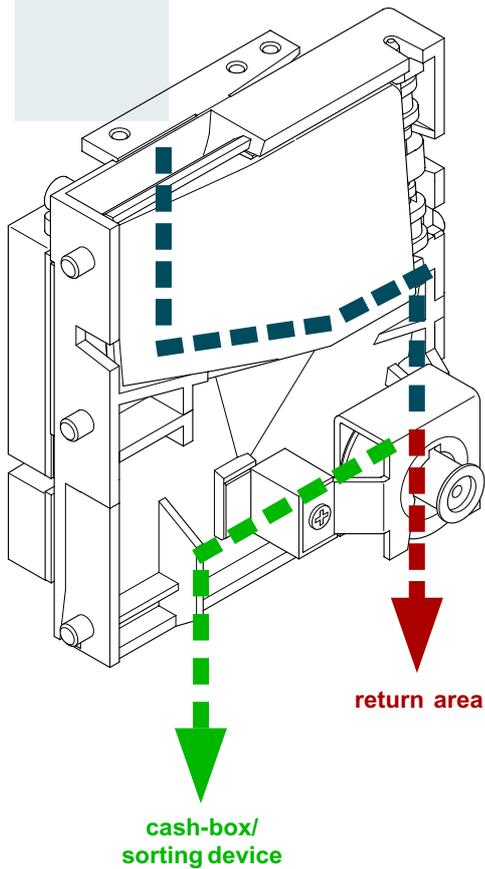


Fig. 2a: Coin acceptance and rejection path of the top entry model

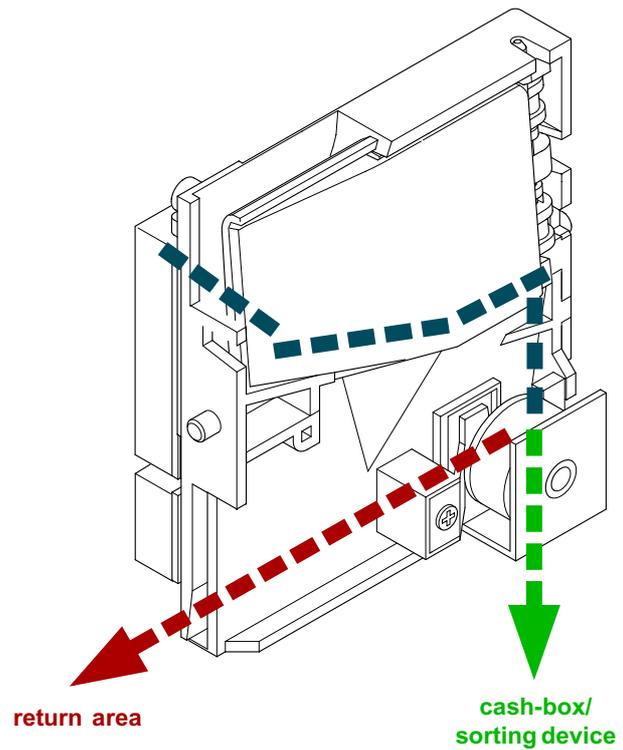
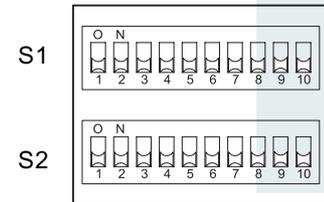


Fig. 2b: Coin acceptance and rejection path of the front entry model

Switching blocks

On the rear side, the coin validator is equipped with two switching blocks (6, Abb. 1) with 10 DIL switches S1.1–10 and S2.1–10 each.



The DIL switches will have different functions, e.g. inhibit coin channels, select memory block. For detail on how to use the switching blocks to set the individual functions, see Chap. 6 "Operation".



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

Return lever and return button

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

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

Label

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

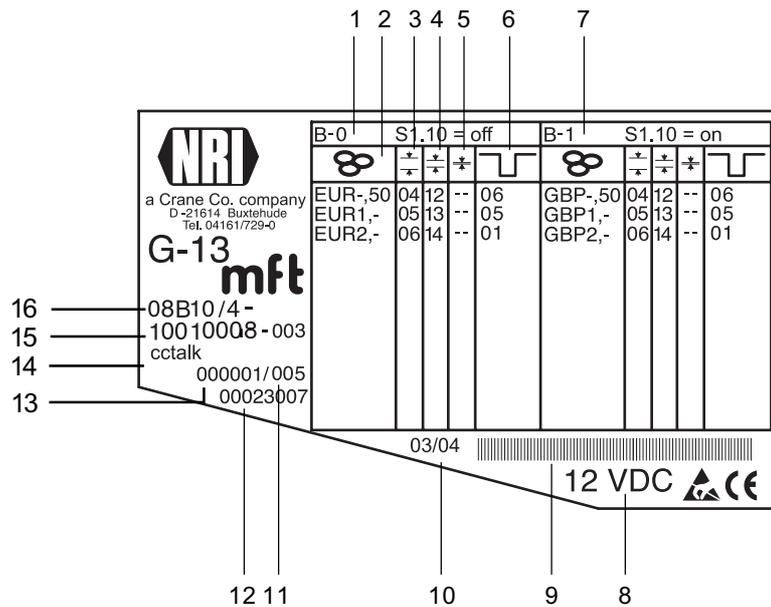


Fig. 3: Label

- | | |
|---|--|
| <p>1 Coin information – memory block 0 (if DIL switch S1.10 on OFF)</p> <p>2 Currency and coin type ∞ – memory block 0</p> <p>3 Channel number, normal coin channel ⊘ – memory block 0</p> <p>4 Channel number, narrow coin channel ⊘ – memory block 0</p> <p>5 Channel number, very narrow coin channel ⊘ – memory block 0</p> <p>6 ccTalk output (coin type) – memory block 0</p> <p>7 Coin information – memory block 1 (if DIL switch S1.10 on ON)</p> | <p>8 Nominal voltage</p> <p>9 Bar code</p> <p>10 Date of manufacture</p> <p>11 Consecutive device number per order number</p> <p>12 Ordering code</p> <p>13 Order number</p> <p>14 Device model</p> <p>15 Data block number and revision number</p> <p>16 Device type
 9B = Front entry model without front plate
 8B = Front entry model with MINI front plate
 7B = Front entry model with MIDI front plate
 6B = Top entry model</p> |
|---|--|

4 Function



This chapter describes how the coin validator works:

- Coin acceptance and coin channels
- Single or double block data-management
- Accepted coin sensors
- Control for external sorting device
- Coin inhibition
- Teach mode

Coin acceptance and coin channels

The coin validator has 32 "memory slots" for coin acceptance which can be assigned up to 32 different coin types or tokens. These "memory slots" are termed coin channels. The acceptance band of a coin type/token is allocated to a coin channel and the coin type/token is accepted in that channel.



Following a reset operation, the coin acceptance function is disabled and must be enabled again by the machine.

As a standard feature, the G-13.mft refuses each further acceptance of a coin if the G-13.mft has not been addressed by the machine within the last 500 ms or if the last accepted coin has not yet been polled by the machine.

In order to reject false coins reliably, frequently for one coin type, in addition to the normal coin channel, channels with a narrow or even very narrow acceptance band are set up (see section "Label" in Chap. 3 "Design"). The limit values of these coin channels are closer to one another so that false coins with similar measured values are rejected, if the normal coin channel is inhibited (see section "Inhibiting coins/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. coin value or sorting information for an external 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 further information desired at any time using the configuration software. Existing configurations can be changed.

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

If the G-13.mft is supposed to be used in gambling machines, the device should be switched over to Casino mode, so that the coins inserted can be accepted more rapidly (instead of 2 coins/sec. up to 6 coins/sec.) (see section "Selecting Casino mode" in Chap. 6 "Operation").

Single or double block data-management

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

If the double block data-management has been configured, the G-13.mft can data-manage two separately programmed (memory) blocks 0 and 1 (see label). The 16 coin channels can be assigned to each block with different coin types (also currencies), sorting information, etc. Only one block can be active at a time and be used for the coin measurement and for further coin processing. You can use the upper switching block on the device to select the desired block (see section "Selecting memory block" in Chap. 6 "Operation").

Accepted coin sensors

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

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

Exception: Casino mode

If the G-13.mft is operated in Casino mode, the validator cannot utilize the accepted coin sensors due to the fast coin acceptance.

The accepted coin sensors are located in front of the cash-box coin outlet and check whether a coin is directed into the cash-box. Usually, coin acceptance is only sent to the machine when the accepted coin sensors notice that a coin is being accepted and directed into the cash-box (see above). To speed up coin acceptance in the Casino mode, the acceptance of a coin is transmitted before the coin passes the accepted coin sensors. Consequently, the acceptance gate of the coin validator is easier to tamper with, e.g. with an inserted coin attached to a string.

Control for external sorting device

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

Sorting principle

The sorting gates are activated via two sorting control lines on pins 3 and 4 of the 10-pole connecting plug (8, Fig. 1) on the rear of the device.

Which coin type is to be sorted via which sorting control line is set by the machine control system.



Assignment coin type – sorting control line and sorting time (how long shall the sorting gates be controlled? 300–1000 ms).



While the coin validator is sorting an accepted coin (= sorting time) it cannot accept any further coins unless the same ccTalk sorter path is addressed.

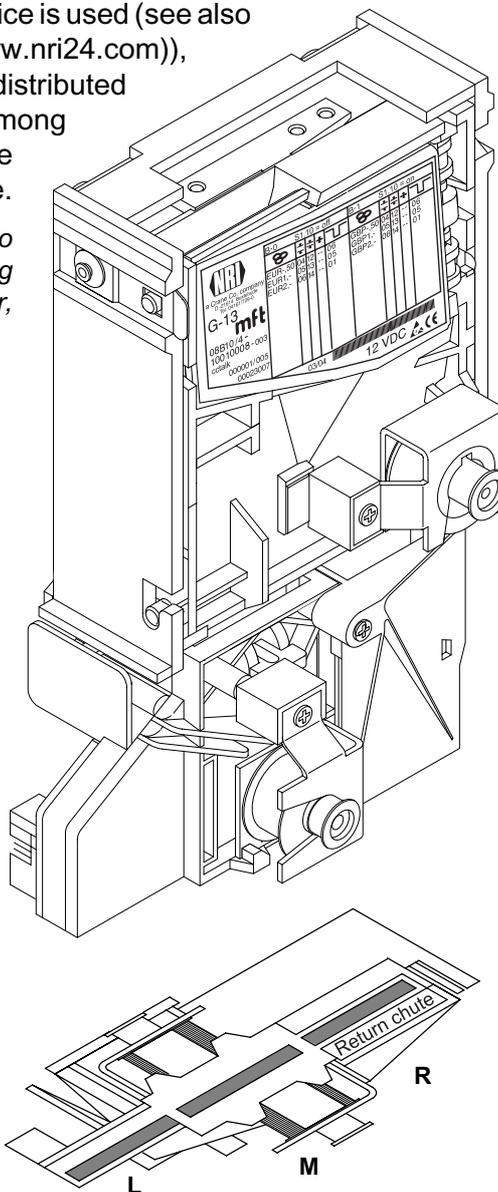
If an external sorting device is no longer required and the sorting time is not set to zero, the coin acceptance speed will continue to be reduced by the preset sorting time. For faster coin acceptance, the sorting time should therefore be set to zero.

Sorting with NRI sorting device

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



For details on how to connect the NRI sorting device to the coin validator, see Chap. 5 "Start-up".



The following table shows which sorting control line must be activated and which ccTalk sorter path is to be addressed in order to sort coins into a specific sorting chute:

Sorting chute	Sorting control line	ccTalk sorter path
Left	6 (pin 4)	3
Middle	–	1, 4–8
Right	5 (pin 3)	2

Coin inhibition

If coins are no longer to be accepted for payment at the machine, you can inhibit coin acceptance using either the machine control system or the coin validator.

Inhibit all/individual coin types via machine control system

The machine can inhibit all coin acceptance. Then the coin validator no longer accepts coins. However, the machine can also inhibit only specific coin types, e.g., if there is no more change in an external payout unit or a coin type is very frequently replaced by false coins.

To find how to program these functions, please refer to the specification "ccTalk Serial Communication Protocol, Generic Specification", which is available on the internet at "www.ccTalk.org".

Inhibit individual coin types/coin groups on the coin validator

As an alternative to the individual inhibiting of specific coin types using the machine, you can inhibit individual coin types or even groups of coin on site using the switching blocks on the coin validator (see section "Inhibiting coin channels/activating narrow coin channel" in Chap. 6 "Operation").



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

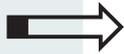
Teach mode

Coin channels can be taught in the teach mode without configuration software either using the lower switching block on the coin validator or via the machine control system, i.e. a coin channel is reassigned a coin type or a token. The new acceptance band is generated by inserting the coins. For this you do not need to remove the validator from the machine. For the teaching procedure, the coin channels 9 to 16 of the activated memory block are available with double block data-management and coin channels 25 to 32 with single block data-management (see also section "Single or double block data-management" in this chapter and section "Teaching coin channels in the teach mode" in Chap. 6 "Operation").



Activate/deactivate teach mode/channels

5 Start-up



This chapter describes how to:

- start up the G-13.mft in a machine
- install the NRI sorting device

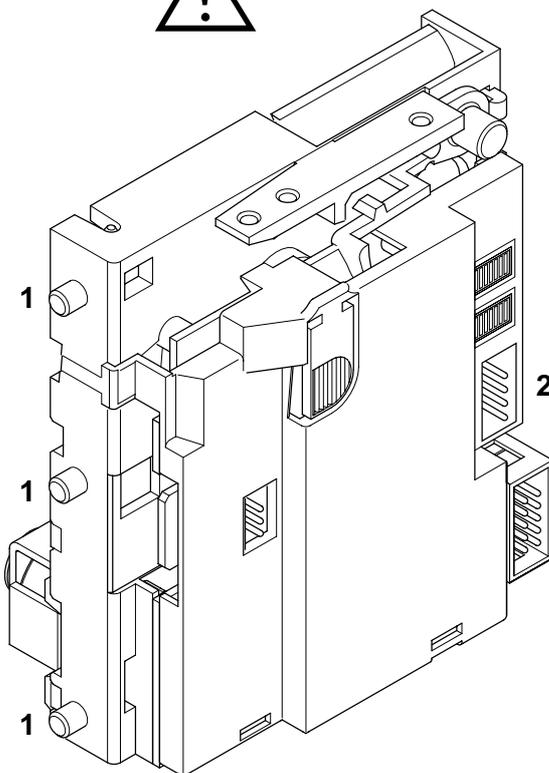
Installing coin validator in the machine

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

- 1 If necessary, install sorting device on the coin validator (see section "Installing sorting device" in this chapter).
- 2 Disconnect the machine from the mains supply.
- 3 Hang the coin validator in the machine mount using the lateral mounting studs **1** (see Fig. 4a).
- 4 Connect the coin validator to the machine using the 4-pole ccTalk interface **2** and the appropriate connecting cable (see Fig. 4a).
- 5 Reconnect the mains supply to the machine.



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



- 1** Mounting studs
(not illustrated on the left-hand side of the device)
- 2** Interface – machine

Fig. 4a: Installation

Installing sorting device

If you want to operate the G-13.mft with the NRI 3-fold sorting device, you must install the sorting device on the validator as follows (see Fig. 4b):

- 1** If necessary, fasten chute extension **1** with screw **2** to sorting device **3**.
- 2** Fasten mounting frame **4** by means of screws **5** and **6** to the rear of the sorting device.
- 3** Hang the coin validator by its mounting studs **7** in the mounting frame.
- 4** Use the 10-pole sorting plug **8** on the PCB **9** and on the rear of the coin validator to connect the sorting device to the G-13.mft with the help of the appropriate sorting cable.
- 5** Connect coin validator to the machine (see section "Installing coin validator in the machine" in this chapter).

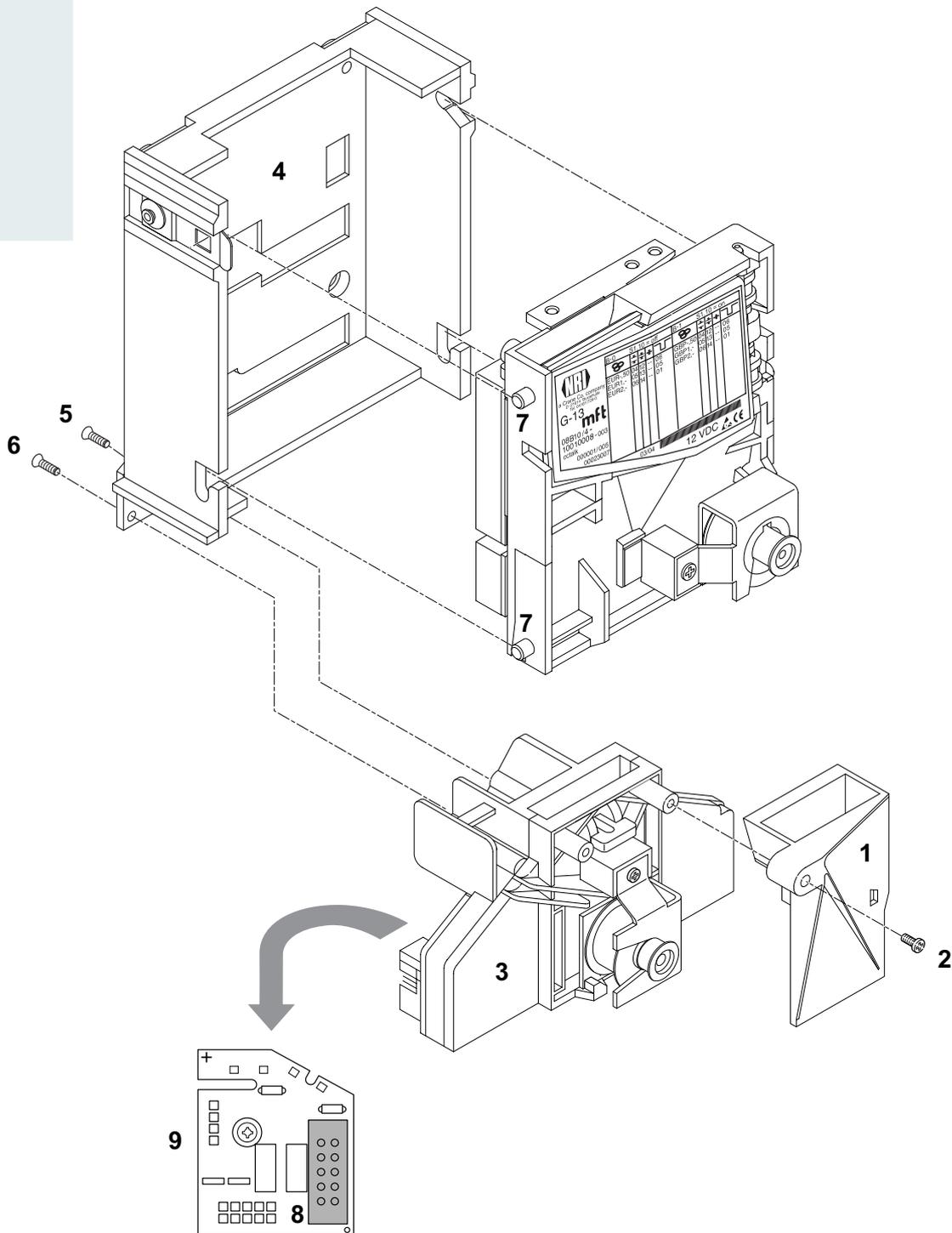
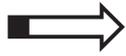


Fig. 4b: Connect G-13.mft, top entry model, to NRI sorting device

6 Operation



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

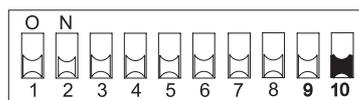
- Selecting memory block
- Inhibiting coins/activating narrow coin channel
- Teaching coin types in the teach mode
- Selecting Casino mode

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

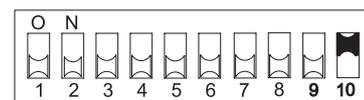
Selecting memory block (only for double block data-management)

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 using the upper switching block.

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



Memory block 0 selected



Memory block 1 selected

Inhibiting coins/activating narrow coin channel ...

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

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

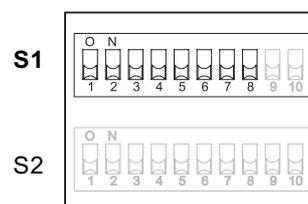
Using the two switching blocks on the coin validator each of the 16 coin channels of the memory block activated or each coin type assigned to a specific coin channel can be inhibited individually, i.e. this/these coin type(s) is/are not accepted for payment on the machine.

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

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

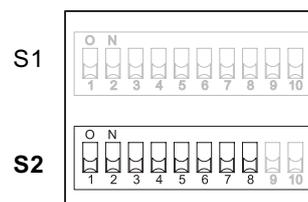
Switching block S1

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



Switching block S2

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



Please refer to the label of the device to see which coin type has been assigned to which coin channel at the factory.

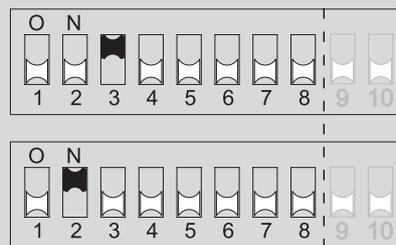


However, this assignment could have been changed using the configuration software.

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

Example

The 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 coin 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 coin 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 activated, the wider acceptance band of the normal coin channel is used. If a coin type is to be inhibited, both coin channels must 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.

... with single block data-management

Coin channels can be inhibited using the first eight DIL switches S1.1–S1.8 of the upper switching block of the device. Which coin types have been assigned to the DIL switches and can be inhibited is shown on the label. Several coin types can also be assigned to one switch. This switch will then inhibit a coin group (e.g. all coins of a currency, all acceptance bands of a coin type (normal and narrow ones)).



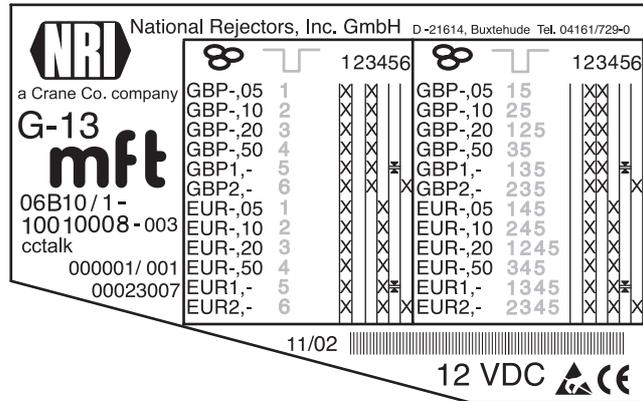
Assignment DIL switches – coin type/coin group

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



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

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



Example – Inhibit a currency as coin group X

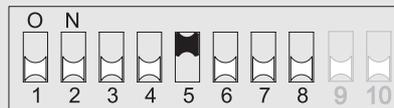
The coin validator must only accept euros and no longer the British currency



With this setting the coin validator only accepts euros.

Example – Activate narrow acceptance bands/coin channels as coin group X

The coin validator must accept the 1-euro coin and the British 1-pound coin in the narrow acceptance band and not in the normal one, i.e. it must inhibit the normal acceptance band



With this setting the coin validator accepts coins in the narrow coin channel and not in the normal one.

Example – Inhibit single coin type X

The coin validator must no longer accept the 2-euro coin or the British 2-pound coin



With this setting the coin validator no longer accepts the 2-euro coin or the British 2-pound coin.



At a coin validator with the label described above, it would also be possible to inhibit the euro currency via DIL switch S1.4.



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

To inhibit coin channels on the validator:

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

Teaching coin channels in the teach mode ...

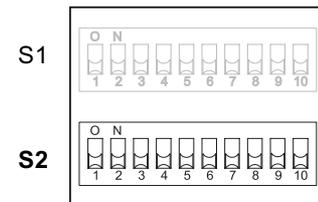
A coin channel can be assigned a token or a new coin either using the lower switching block on the coin validator or using ccTalk commands and the machine service menu.

... using switching block on the coin validator

In order to generate new acceptance bands you can teach up to eight coin channels using the lower switching block on the coin validator. You will need at least ten coins of the new type. There is a different switch assignment for the double and single block data-management:

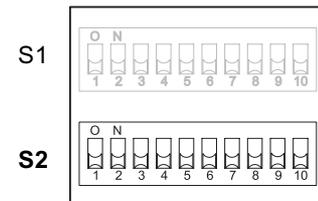
Switching block S2 (with double block data-management)

DIL switch		off	on
S2.1	Coin channel 9	–	teach
S2.2	Coin channel 10	–	teach
S2.3	Coin channel 11	–	teach
S2.4	Coin channel 12	–	teach
S2.5	Coin channel 13	–	teach
S2.6	Coin channel 14	–	teach
S2.7	Coin channel 15	–	teach
S2.8	Coin channel 16	–	teach
S2.9	Teach mode	switch off	switch on
S2.10	Acceptance band	normal	wide



Switching block S2 (with single block data-management)

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

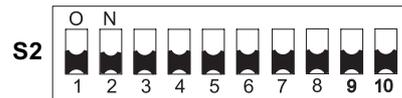


To assign a coin type to a new coin channel, please proceed as follows:

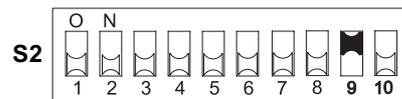


If you use the lower switching block to inhibit individual coins, remember the current switch settings so that you can restore them easily for the normal operating mode at the end.

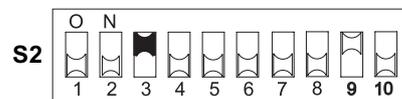
1 Set all DIL switches S2.1–10 toward the bottom to OFF.



2 Set DIL switch S2.9 toward the top to O
N
Now the device is in teach mode to teach the coin channels.



3 Release the coin channel to be taught (9–16 or 25–32, here: 11 or 27) by setting the appropriate DIL switch (S2.1–8, here: S2.3) toward the top to ON.



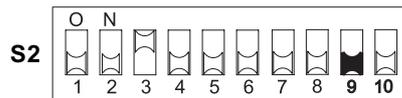
4 Insert at least 10 coins of the new coin type/token into the coin validator or machine.

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

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 tokens.

To save with the normal acceptance band:

5a) Set DIL switch S2.9 toward the bottom to OFF.



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



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

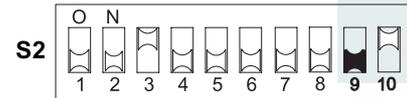
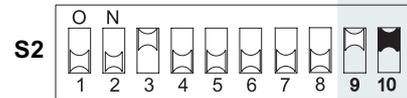
To save with a wide acceptance band:

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

The acceptance band has been widened.

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

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



To abort the operation, first set the DIL switch of the respective coin channel (here: S2.3) as well as DIL switch S2.10 and then DIL switch S2.9 toward the bottom to OFF.

- 6** Set DIL switches S2.1–8, if necessary, for the normal operating mode (see section "Inhibiting coins/activating narrow coin channel" in this chapter).

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

... using ccTalk commands/machine service menu

In order to generate new acceptance bands you can teach coin channels using a ccTalk instruction set (see section "Teach mode" in Chap. 9 "Technical data"). Applying this instruction set the teach mode can be started and monitored, e.g. via a service menu.

The new acceptance bands are generated and stored by inserting ten coins/tokens of the new type. After having stored the acceptance bands the new coin type/token will be accepted for payment by the coin validator.

For all further information on teaching coins/tokens using the service menu please refer to the machine manual.



The label shows which coin channels are not assigned to a coin yet and can be assigned to new coins/tokens (see section "Label" in Chap. 3 "Design").



If you overwrite a coin channel in the teach mode which has already been configured, you must adapt all features assigned to this channel (e.g. coin ID, sorting, etc.) to the new coin/token (see separate WinEMP manual).

Selecting Casino mode

If you would like to operate the G-13.mft in Casino mode, you can easily change the operating mode by means of the upper switching block:

Set DIL switch S1.9 toward the top to ON.

The device now operates in Casino mode with quick coin acceptance of five to six coins per second.

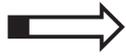


Attracting time of the acceptance gate



Due to fast coin acceptance the G-13.mft cannot utilize the accepted coin sensors in the Casino mode (see section "Accepted coin sensors" in Chap. 4 "Function").

7 Maintenance and service



In this chapter you will find how to

- clean the G-13.mft and
- remedy the cause of a malfunction.

Cleaning coin validator

The coin validator must only be wiped clean from time to time with a damp cloth (lukewarm water with some detergent). Beyond that, no further maintenance work is required.



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

- 1** Pull the machine's mains plug.
- 2** Carefully open the flight deck **1** on the left-hand side and hold it open (Fig. 7).
- 3** Use a cloth to wipe off the coin runway inside the coin validator.
- 4** Close the flight deck again.
- 5** Reconnect the machine to the mains supply.

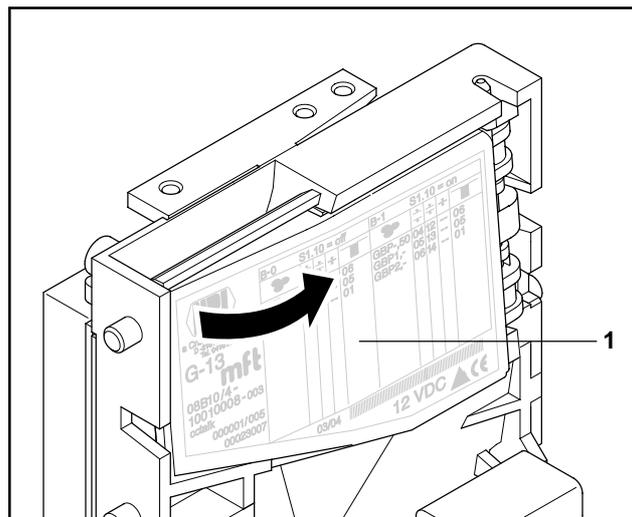


Fig. 7: Open the flight deck of the coin validator.

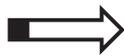
Troubleshooting

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"> • Connect connecting cable to coin validator and machine correctly • Supply machine with voltage
	Return lever/button pressed/got stuck	Make sure, that return lever/button is not inadvertently pressed
	Coin runway dirty	Open flight deck and clean coin runway (see section "Cleaning coin validator" in this chapter)
	Coin inhibited	<ul style="list-style-type: none"> • Make sure that machine control system does not inhibit coin acceptance • 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 coins/activating narrow coin channel" in Chap. 6 "Operation")
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.

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-13.mft 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 data blocks currently provided by NRI (data block download).

The WinEMP software identifies the coin validator connected to the PC/laptop and the device-own data and presents that data on the screen of your PC/laptop 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)):

- 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)):

- 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 false coins (acceptance band adjustment following the insertion of genuine coins and false coins)
- Attraction time of the acceptance gate
- Coin value via assignment of coin channel to
 - ccTalk output (coin type)
 - coin ID
- Sorting via
 - assignment of coin channel to sorter path
 - sorting time
- Inhibition of coins via assignment of coin channel to DIL switches S1.1–8 (internal inhibition, only single block data-management)
- Deactivation/activation of coins on a long-term basis
- Deactivation/activation of teach mode/teach channels
- New coins/tokens (creating a new acceptance band and assigning the ccTalk output (coin type/ID))
- Data block download for current coin and device data

9 Technical data



This chapter contains information about

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

Device data

Supply voltage	10 V to 16 V DC
Power consumption	Standby mode: approx. 30 mA Measuring mode: approx. 100 mA Coin acceptance: approx. 100 mA + approx. 3 W
Transmitter/receiver (active low)	Inactive (H): 3.5 .. 5 V, $I_{\max} = 5 \mu\text{A}$ Active (L): 0 ... 1 V, $I_{\max} = 30 \text{ mA}$
Temperature range	-25 °C to 70 °C
Temperature change	Max. 0.2 °C/min.
Rel. Humidity	Up to 93 %
Condensation	Not permissible
Machine interface	9600 baud, 8-bit, N, 1, 1, 5 V TTL, common transmitting and receiving line, active low Protocol in compliance with ccTalk 4.2, Money Controls; For pin assignment see section "Pin assignment" in this chapter
Sorting interface	6 parallel outputs (open collector)
Coin acceptance	32 coin types max. in 2 x 16 or 1 x 32 channels Coin diameter: 15–31.5 mm (optionally up to 32.5 mm) Coin thickness: 1.5–2.5 mm (optionally bis 3.3 mm) Speed: 2 coins/sec. (Casino mode: 5–6 coins/sec.)
Device dimensions	Height: 102 mm Width: 89 mm Depth: 52 mm (For mounting dimensions, see separate documentation)
Mounting position	Vertikal, max. deviation: $\pm 2^\circ$
Mark of conformity	CE (see next section)

CE certification

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

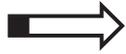


Which directives were applied can be seen in the declaration of conformity. The manufacturer must keep this declaration available for the monitoring authorities only (for a minimum period of 10 years after the last product has been introduced to the market). However, upon request we can provide copies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

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

1. The EMC Directive (89/336/EEC)
for devices which cause electromagnetic interference or are interfered with by such.
2. The Low Voltage Directive (73/23/EEC)
for electrical 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.

Interfaces (pin assignment and status/error messages)



In the following sections you will find the pin assignment, ccTalk commands as well as default settings after a reset for the connection of the G-13.mft ccTalk to the machine and to an external sorting device.

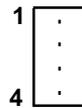
Pin assignment G-13.mft – machine

Pin 1 12 V DC supply

Pin 2 nc

Pin 3 GND

Pin 4 data



You will find a detailed description of the serial ccTalk interface with various connection diagrams in the specification "ccTalk Serial Communication Protocol, Generic Specification", which is available on the internet at "www.cctalk.org".

Pin assignment G-13.mft – external sorting device

Pin 1 GND

Pin 2 12 V DC supply

Pin 3 sorting control line 5

Pin 4 sorting control line 6

Pin 5 nc

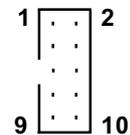
Pin 6 nc

Pin 7 possible sorting control line 1

Pin 8 possible sorting control line 2

Pin 9 possible sorting control line 3

Pin 10 possible sorting control line 4



Commands, status and error messages

In the following tables you will find commands, status and error messages, which are sent to the machine from the coin validator and are implemented as headers in the ccTalk protocol.

Implemented ccTalk commands

Header	Command [bytes expected/returned]	Deviation acc. to version for Italian gambling machine market (ACMI)
254	Simple poll: [0/0]	
253	Address poll: [0/1]	
252	Address clash: [0/1]	
251	Address change: [1/0]	
250	Address random: [0/0]	
249	Request polling priority: 2,20 ("200 ms" [0/2])	
248	Request status: 0 = OK/ 1 = Return lever aktuated [0/1]	
246	Request manufacturer ID: "NRI" [0/3]	
245	Request equipment category ID: "Coin acceptor" [0/13]	
244	Request product code: "G-13" [0/3]	
243	Request database version: 0 (remote coin database not available) [0/1]	
242	Request serial number: 3 bytes [0/3]	
241	Request software revision: "xx.xx" [0/5]	
240	Test solenoids: Bit0: Gate 0, Bit1: Gate 1, Bit2: Gate 2, Bit3: Gate 3 1 = OK/0 = Error [1/0]	
238	Test output lines [1/0] (from firmware version -002 on): Bit0: 1 = open escrow to cash-box Bit1: 1 = open escrow to return area	
236	Read opto states: Bit0: LS1, Bit1: LS2, Bit4: CP3, Bit5: CP4 0 = OK/1 = blocked [0/1]	

Header	Command [bytes expected/returned]	Deviation acc. to version for Italian gambling machine market (ACMI)
232	Perform self test: 0 = OK/1 = EEPROM checksum corrupt [0/1]	
231	Modify inhibit status: [2/0]	
230	Request inhibit status: [0/2]	
229	Read buffered credit or error codes: See buffered error code table below [0/11]	
228	Modify master inhibit status: [1/0]	
227	Request master inhibit status: [0/1]	
222	Modify sorter override status: 4-way override [1/0]	1-way override [1/0]
221	Request sorter override status: [0/1]	
219	Enter new PIN number: [4/0]	
218	Enter PIN number: [4/0]	
216	Request data storage availability: 0, 0, 0, 0, 0 [0/5]	no reply
213	Request option flags: [0/1] Bit7 _(MSB) : 1 = Teach mode supported Bit6: 1 = Escrow control supported Bit5..0: not used (=0)	
210	Modify sorter paths: 5 bytes [5/0]	2 bytes [2/0]
209	Request sorter paths: 4 bytes [1/4]	1 byte [1/1]
202	Teach mode control: [1/1]	no reply
201	Request teach status: [0/2]	no reply
192	Request build code: [0/3] (see section "Build code table" in this chapter)	
189	Modify default sorter path: [1/0]	
188	Request default sorter path: [0/1]	
185	Modify coin ID: Duration: 0.5..1.5 s [7/0]	no reply
184	Request coin ID: i.e. "EU200A" = 2.00 EUR [1/6]	
4	Request comms status revision: 1, 4, 2 [0/3] 2, 4, 2 (from firmware version -003 on)	
1	Reset device: [0/0]	

Buffered error code table

1	Reject coin
2	Inhibited coin
8	2 nd close coin error
10	Credit sensor not ready
14	Credit sensor blocked
16	Credit sequence error
17	Coin going backwards
20	Coin-on-string mechanism activated
254	Coin return mechanism activated
255	Unspecified alarm code

Build code table (write protection)

Write protection	ccTalk standard	ccTalk for Italy
Undefined	G01, G03	I05
Not protected	DE0	IT0
ACMII	DE1	IT1
VDAI	DE2	IT2
Extra	DE3	IT2

Default settings (following reset)

All settings performed by the machine control system are transient (exception: "modify coin ID"). Following a reset operation, the following default settings are applicable until the control system changes any settings:

Description	Value
Address	2
Inhibit status	00h 00h (all coins inhibited)
Master inhibit status	01h (not inhibited)
Sorter override status	FFh (no override)
PIN number	0 0 0 0 (PIN not used)
Sorter paths	predefined setting acc. to data block
Default sorter path	predefined setting acc. to data block

Teach mode**Header 202 – Teach mode control**

Transmitted data: Position (1 byte)

Received data: ACK

Position: Bit 0..6: Coin type (1..16)

Bit 7: 0 = Normal acceptance band,
1 = wide acceptance band

Position = 0 = abort teaching process

Header 201 – Request teach status

Transmitted data: None

Received data: Byte 1 = No. of coins inserted

Byte 2 = Status code:

252 = teaching process aborted (see header 202)

253 = teaching error (overlapping with existing
acceptance band, coin type not found)

254 = teaching in process

255 = teaching process completed



The status code remains active until reset or the next teaching process.

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

Sorting device

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

Test tools

For all details regarding the NRI test software for payment systems with a serial interface please refer to our web pages for the product G-13.mft on the internet (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).

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Glossary

Acceptance band	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.
Acceptance gate	The acceptance gate diverts the inserted coins into the acceptance or return area of the coin validator.
Accepted coin sensors	The accepted coin sensors are positioned in front of the cash-box coin outlet of the coin validator and check whether accepted coins fall unhindered into the cash-box chute.
Attraction duration	The attraction duration is used to specify the period of time for which the solenoid is to attract the → <i>acceptance gate</i> in order to guide the accepted coins to the cash-box or an external sorting device.
Block	→ <i>Memory block</i>
Channel	→ <i>Coin channel</i>
Coin acceptance band	→ <i>Acceptance band</i>
Coin channel	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 along.
Coin properties	Coin properties are measured when a coin is inserted into the coin validator. These are e.g. material, thickness, volume, minting, diameter, mass, hardness, etc.
Coin type	One coin type includes all coins for which the → <i>coin properties</i> agree.
Coin value	The value of a → <i>coin type</i> that is transmitted to the machine using the respective ccTalk output 1–16 (coin type) and ccTalk coin ID.
Data block update	When updating a data block (set) (2 data blocks) using WinEMP, the data blocks for the connected coin validators are loaded quickly and easily from the internal hard disk of your PC into the coin validator. By doing this, a new data block is loaded into → <i>memory block 0</i> (and <i>memory block 1</i>). The new data blocks contain different coin and device configurations e.g. current limit values of the → <i>acceptance bands</i> for a currency or new inhibiting or sorting information.

ECV	Electronic Coin Validator
Memory block	<p>Memory of the coin validator. At the manufacturer's company, a customer-specific setting is programmed to determine whether the 32 → <i>coin channels</i> of the G-13.mft are to be data-managed in one memory block (single block data-management) or, when divided into 16 channels each, in two memory blocks (double block data-management). Two (memory) blocks 0 and 1 can be used to data-manage two independent configurations of coin/device data (e.g. two currencies). However, for coin validator operation, only one memory block with 16 channels can be active at a time; the other block is inhibited.</p> <p>The memory block(s) can be updated using WinEMP (→<i>€data block download</i>).</p>
Sorting control line	<p>To sort the cash-box coins with an external sorting device, the coin validator has 2 defined and 4 undefined sorting control lines.</p>
Sorting gate	<p>The sorting gates are activated in the coin validator depending on the run time of accepted coins and direct the coins to be sorted into the return area or coin outlet towards the cash-box or external sorting device.</p>
Sorting time	<p>The sorting time specifies the switching times of an external sorting device.</p>
String sensor	<p>The coin validator's optional sensor recognizes a coin inserted with a piece of string attached to it. The coin is not accepted for payment.</p>
Switching blocks	<p>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 or grouped → <i>coin channels</i>.</p>
Teach mode	<p>In the teach mode, the last eight → <i>coin channels</i> can be assigned new → <i>coin types</i> or → <i>tokens</i> by inserting coins and without any configuration tools on site at the machine, which means that these newly configured coins are accepted in the respective coin channel for payment.</p> <p>The teach mode may be controlled either using the → <i>switching blocks</i> on the coin validator or ccTalk commands and the machine service menu.</p>
Token	<p>Tokens are accepted for payment at machines instead of coins in a currency.</p>