AL 55/66 WINDOWS PROGRAMMER

User Manual

Table of contents

Changes

v1.2   Changes has been made in Configuration chapter 4.1.5, acording to the new revision of program software: ver. 1.200, from 26.11.2008.

1. General description

Electronic coin selectors **AL55xx** and **AL66xx** are 3¼" programmable coin selectors. That means that user can program and change coin recognition and configuration data of coin selector. This will give the great advantage of use the same type of coin selector in different devices and applications.

Similar to the previous generation[1], the coin selectors **AL55xx** and **AL66xx** main program memory is also possible to upgrade("*FLASH up-grade*") by user.

This will extent the coin selector exploitation period and user will have possibility to add a new functions and have benefits of all future software improvement.

The software described in this manual, different detailed documents and a technical assistant of our experts will help user to exploit all variety of functions from our coin selectors.

AL55/66 Programming and configuration utility is application software for new generation of coin selectors **AL55xx** and **AL66xx** programming and testing.

It is self extractable file program that will run an automatic installation on your PC.

Minimum operational system must be WIN98, or some of the later one[2].

Recommended OS is **Windows XP**(*home or professional*) and monitor resolution with minimum resolution of **1024x768**!

This software use **ccTalk**® protocol described in Technical manual of coin selector[3].

Connection with PC is made through ccTalk/RS232 adapter or ccTalk/USB adapter.

2. Installation

Uninstall the old version of program before installation of new version!

To uninstall the old version use <u>Add or Remove Programs</u> from <u>Control Panel</u> , Start Menu (*UninstalAL66 WinProg*) or start executable file **unins000.exe** from directory in which program was installed.

After that, start self extracting executable installation file:

AL66_setup_x_yyy_USER_lll.exe, and follow the setup instructions.

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1 Coin selectors AL05x and AL06x
2 Including **Vista**
3 AL55-66TehManual-v...pdf

3. Get started

All software and eventually USB driver must be installed. Coin selector power supply and connection to PC through adapter[4] must be checked before start to use program.

3.1 Connection

Coin selector is connected with peripheral device or host through connectors[5] on PCB. Main 10 pole IDC connector X1 is used for coin selector power supply and standard serial or parallel peripheral interface[6]. Power supply must be between 8 do 26 VDC. Pin 2 is connection of positive power source, while 1[7] is common connection(*ground*). For testing purposes user can plug in test board(*programming kit*) to this connector. For PC(*host*) connection on serial COM port, standard **ccTalk/RS232** adapter is used(*programming kit*). For USB port connection special **ccTalk/USB** adapter is used. Some version of USB adapters can also provide power supply to the coin selector. User must not overload USB power source(*limited to 500 mA*) with additional load like sorter or lamps!
**Install drivers before connection of USB adapter!**

3.2 Program start

It is possible to start the program through installed icon from desktop, from program start menu or by activation of the executable file from directory in which the program was installed(*AL66.exe*).
After the start, the main program window described in chapter 4 will be open.
If the coin selector was connected and powered, the host software will automatically start search and read the basic coin selector information data.
Information window, like one on image 3.1 will appear on screen.
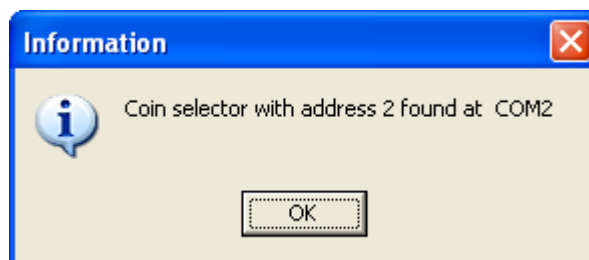
Img. 3.1 Information window after start

Serial COM port number and coin selector ccTalk address will be displayed.
If we start program without coin selector, error window like one on the image 3.2 will appear on screen.
The host software search for coin selector only at start up!
If the coin selector is connected after, user must pres the button **[Search]** and the host software will find and read basic information of connected coin selector again.
This must be done after each change of coin selector!

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4   Coin selectors AL66xx have LED lamps to indicate power presence and failure state.
5   Coin selectors AL55xx has 2, and AL66xx has 3 connectors
6   see Tech Manual...
7   Exception are coin selectors for Spanish market(*see Tech Manual...*)

Img. 3.2 Error window "Device not found"

If connected coin selector is: not manufactured by ALBERICI, not supported type of coin selector or it is unknown device, error window will appear!
Example of error window when coin selector is not from ALBERICI is shown on image 3.3.

Img. 3.3 Error window "manufacturer is not ALBERICI"

If older generation of coin selector AL06V-c(*ccTalk*) is connected, error window like one on image 3.4 will appear!
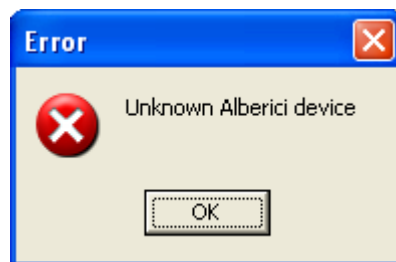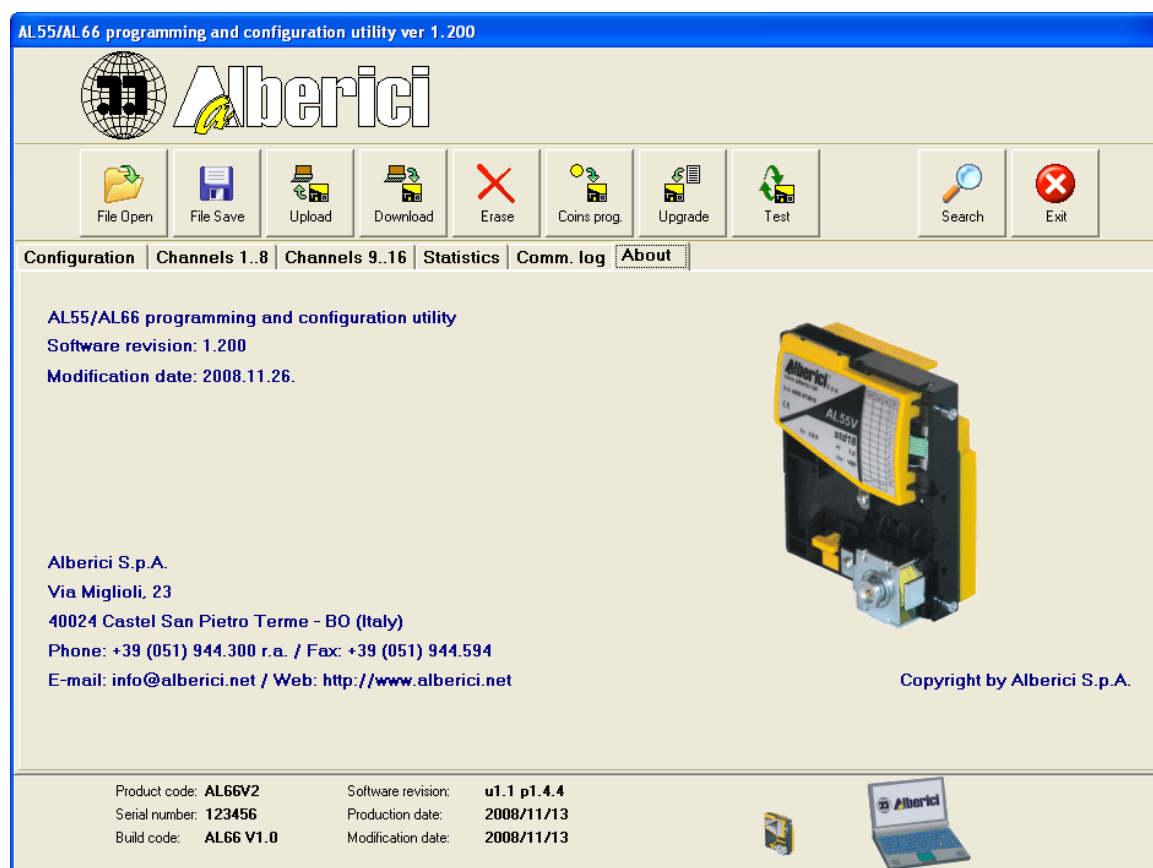

Img. 3.4 Error window "device(*coin selector*) is not compatible"

4. Main program window

Main program window is divided in to several parts:

- header with program name, version and manufacturer logo
- special function tool bar
- tabbed pages(*menus*)
- coin selector general information

Main program window after start-up is shown on image 4.1.

Img. 4.1 Main program window after start-up

After start-up **About**(*Info)* page(*menus*) will be shown first!

The program name and version are displayed in the main program window <u>header</u>:
AL55/66 programming and configuration utility ver 1.200.
Header(*top blue part*) and company logo is present in all pages(*menus*).

Main program window has <u>tool bar with buttons</u> for activation of special function.
One of the function(*last button*) is for closing the program: **[Exit]**.

In the middle of program window there is a place for tabbed <u>pages(*menus*)</u>.
Pages are changed with selection tabs on top of each page. Main program window
appearance will change with each selected page. Tabbed pages are used mostly for
graphic presentation of coin selector specific data groups.
<u>Basic coin selector information</u> are displayed in the bottom of the main program

window and shown on image 4.2. Information from coin selector are updated after each activation of "search" function or at the program start-up.

Product code:	**AL66V2**	Software revision:	**u1.1 p1.4.4**
Serial number:	**123456**	Production date:	**2008/11/13**
Build code:	**AL66 V1.0**	Modification date:	**2008/11/13**

Img. 4.2 Coin selector basic information

Product code: AL66V2
There is more coin selector versions according to mechanical construction or sensor number and placement. Some of this differences are not clearly visible.
Each version has different product code[8].

Serial number: 123456
Each coin selector in production get its unique identification number or serial number.
That number with some additional markings is also displayed on factory label.

Build code: AL66 V1.0
Build code should match one on the PCB.

Software revision: u1.1 p1.4.4
Software revision has two parts. First part is revision of "monitor" program:"u 1.1".
This part is not possible to change with program FLASH up-grade.
Letter **u** stand for "up-grade", first number is major change of monitor program that will make coin selectors incompatible with older version for program up-grade.
Second number is for minor change that will has no influence on coin main program compatibility.
Second part is main program revision:"p1.4.4". This part start with letter **p**(*program*) and has 3 numbers separated with "."(*dot*).
Most significant number is for major program modification that include also a different memory organization. Second number is for addition of new function and program modification but has no influence to coin selector data compatibility.
Third less significant number is for error correction and non significant changes.

Production date: 2008/11/13
Date of production is hardwired in monitor program FLASH memory and set during production process. This date is possible to change only in factory, and will stay unchanged even after future up-grade of program FLASH memory.
Date format is: **Y**ear/**M**onth/**D**ay.

Last modification date: 2008/11/13
Last modification date is date when program FLASH up-grade file was created.
It is not a date when up-grade was performed! It has the same format as production date.

In the bottom of the main program window there is also presentation(*animated*) of communication activity between host PC and coin selector.

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8   See details in Technical manual of coin selector

4.1   Tabbed pages(*menus*)

After the program start, the **About** page will be selected in main program window.
To select other pages set cursor to tab on the top of the pages and click on it.
It is possible to select six different pages(*menus*):

- About(*Info*)
- Comm. log
- Statistics
- Channels 9-16
- Channels 1-8
- Configuration

Order of pages(menus) is from right to the left(*see image 4.1*).

4.1.1 About

This page will show only basic information about software: program name,
description, number and date of revision and some contact information.
Page example is shown on image 4.1 at the beginning of chapter 4.

4.1.2 Comm. log

Page **Comm. log** is a terminal for communication shown on image 4.1.1.
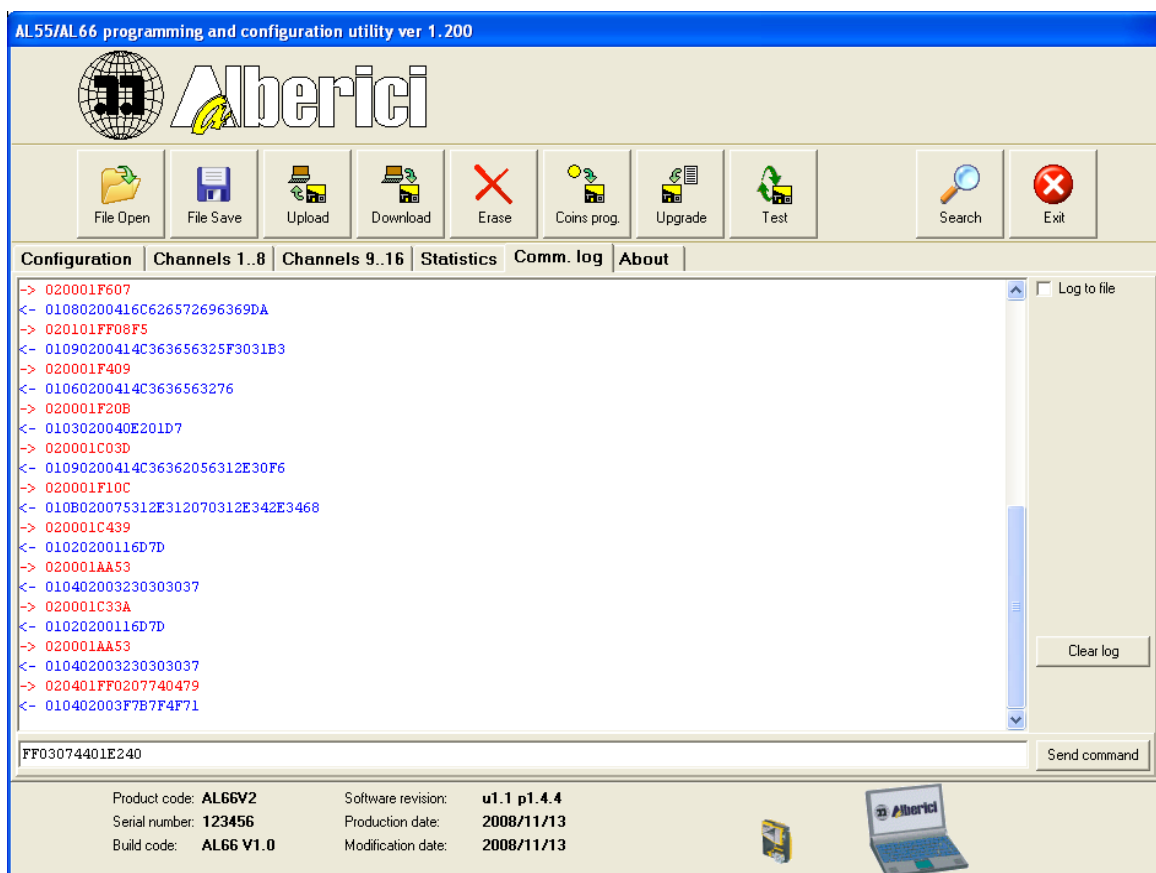
Img. 4.1.1 Communication page(*terminal*)

The terminal has one bigger window(*log monitor*) in which communication messages from host(*red*) and from coin selector(*blue*) are shown. Messages in this log monitor are scrolling up and last message is always visible at the bottom of window or as last line. Log act as FIFO(***F****irst **I**n **F**irst **O**ut*).
Messages log is possible to save in file, activating the check box **Log to file**.
Button **[Clear log]** will clear all terminal window line and not the file log.

Small window is used to write or paste one line of instruction message from host to coin selector. This message must contain only instruction header and data field[9].
All other parts of message string, program will calculate automatically[10] and than sent to the coin selector after pressing the button **[Send command]**, on the left of the window.

Terminal is useful tool for users who want to create their own application with coin selectors using ccTalk protocol. All instructions that coin selector support will be possible to test and review.

4.1.3 Statistics

Page **Statistics** shown on image 4.1.2 is presentation of coin selector internal NV[11] counters(*statistics*).
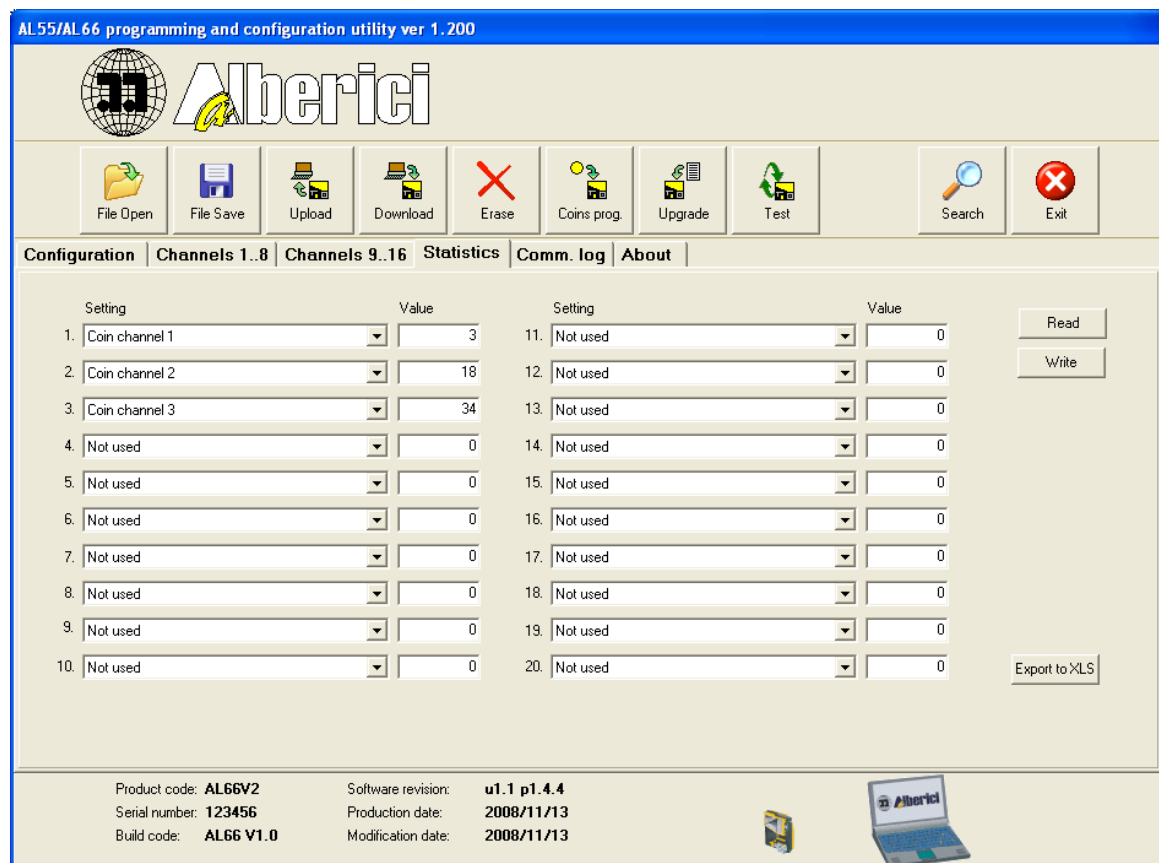
Img. 4.1.2 Show, modify and erase of counters(*statistics*)

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9   see ccTalk protocol and Technical manual of coin selector for details.
10 Sender address, host address, nr. of bytes and checksum
11 **N**on **V**olatile, means saved during power down in to FLASH memory

There are totally 20 counters, each are 3 byte long(*maximum count = 16 777 215*).
Table has two parts with 10 counters in each part. Each counter has description name
selected from fall-down menus in field **Setting**, and corresponding value in the
window on the right field **Value**. Unused counter value is always **0**.

On the right side of page there are 3 buttons for: read, set-up and transfer statistics
in to **.xls** file.

With button **[Read]** we can refresh statistic counters value and setting if there was
some changes after the last read of coin selector data.
In example if we start program and select statistic page, data will not be transfered
automatically from coin selector to the program. To read coin selector data including
statistics we must use main program button **[Upload]**[12] or use button **[Read]** on this
page(*just for statistics data*)!
Button **[Write]** is used to change the setup of the coin selector statistics memory.
To erase(*or clear*)[13] statistics use main program button **[Erase]** and than select
statistics block of data[14] to be erased.

When statistics set-up is changed, corresponding counters will be cleared!
Statistic counter value is not possible to change with any command.
It is only possible to clear the counter value(*set to zero*)!

To change statistic setting or clear counters user must know secret password(*PIN*).
At first attempt to change or clear statistics the new window dialog shown on image
4.1.3 will appear.
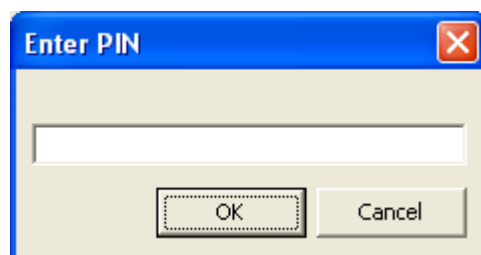
Img. 4.1.3 User PIN dialog window

User PIN is written as 4 byte hexadecimal number and initially is set in factory to the
value: **00000000(*hex*)**.
It is recommended that user change this PIN before coin selector is installed.
Any combination of numbers or letters that are representing the hexadecimal number
is allowed[15]. Character size is there fore 8. Small letters are also allowed and will be
interpreted as capital letters. Number of combinations with 4 byte PIN number is:
4 294 967 295. Internal mechanism of coin selector do not allow fast repetition of
new PIN in case of error[16] and "brutal force" PIN detection will be almost impossible.
In addition for user safety typed character in the window will be displayed as *****.
In case of PIN error or wrong number of character error message window shown on
image 4.1.4 will appear.

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12 See chapter 4.2.3
13 It is better to use clear, because erased memory has all bits in state 1 and clear is when they are 0.
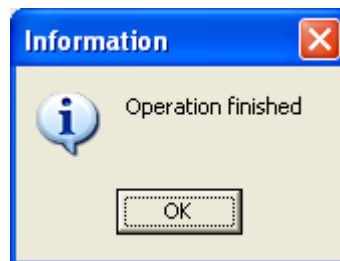14 See chapter 4.2.5
15 Numbers from 0-9 and letters: A, B, C, D, E and F
16 Delay of 100 ms plus communication delay will give average time of 6 years to discover PIN!

Img. 4.1.4 Messages in case of PIN(*user password*) error

If password was correct new statistic setting will be written in to coin selector memory and information message shown on image 4.1.5 will appear.

Img. 4.1.5 Information message: "success"

To transfer statistic in to Microsoft excel table file use button **[Export to xls]** in the right bottom side of page. Pressing this button the system window dialog: "Save as" will appear and user must select file name and directory to save statistic data.
Data table example is shown in table 1.

Statistic data for: AL66V2
Serial number: 123456

Date   3.9.2008

Stat. No	Stat. type	Value
Stat. 1	Coin channel 1	37
Stat. 2	Coin channel 2	26
Stat. 3	Coin channel 3	20
Stat. 4	Not used	0
Stat. 5	Not used	0
Stat. 6	Not used	0
Stat. 7	Not used	0
Stat. 8	Not used	0
Stat. 9	Not used	0
Stat. 10	Not used	0
Stat. 11	Not used	0
Stat. 12	Not used	0
Stat. 13	Not used	0
Stat. 14	Not used	0
Stat. 15	Not used	0
Stat. 16	Not used	0
Stat. 17	Not used	0
Stat. 18	Not used	0
Stat. 19	Not used	0
Stat. 20	Not used	0

Table 1 Coin selector statistic record

4.1.4   Channels

Main coin selector task is to recognize and accept or reject coins.
Recognition and other coin data(*channel data*) are presented on 2 identical pages.
On first page, coin channels from position 1 to 8 are displayed and coin channels
from position 9 to 16 are displayed on second page.
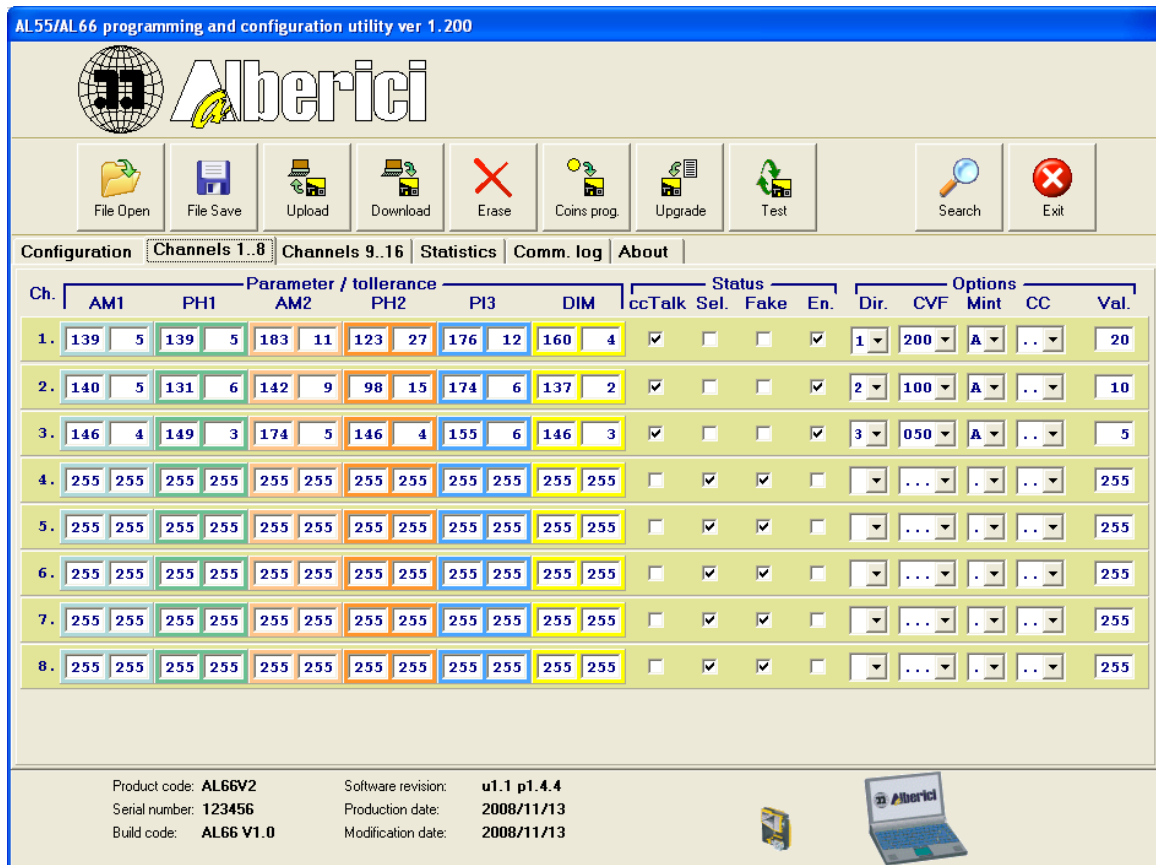
Img. 4.1.6   Coin channels(*from 1 to 8*) page

If this page(*menu*) was selected and coin data has not been loaded yet(*buffer empty*)
all numerical values will be 0 and all other data blank!
Empty buffer is not possible to transfer in to the coin selector or save in to file.
After transfer coin channel data from file or from coin selector it is possible to change
data by writing or selecting the new values from fall-down menus.
Status flags is possible to change with mouse click on status check box.
Using buttons from main program: **[File save]** or **[Download]**[17], coin data can be
saved to file(*.xml*) or in to coin selector memory.
Coin selector data organization is described in separate document and it is available
to customer at request. Coin data are:

- Parameters/tolerances
- Status
- Options

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17 See button description in chapter 4.2

1.1.4.1 Parameters/tolerances

This data are used by coin selector software in coin recognition process.
Parameters together with tolerance create acceptance gap in which tested coin
measured values must fit in. If there is more than one match found, probability
calculation and analysis is done and coin is finally register as coin of certain position
or as not recognized!
It is possible to change any of recognition parameter by writing the new value in to
the corresponding window.
Tolerance is calculated and written during the coin programming[18] or teaching[19]
process. Master files with coin data usually has higher tolerance to compensate some
differences between coin selectors which are not possible to avoid even with coin
selector calibration in production process.
It is also possible to change tolerance but this must bi done with care to avoid low
acceptance rate for some coins(*tolerance to low*) or acceptance of unwanted fake
coins(*tolerance to high*).
When coin is programmed and tolerance calculated, programming software will add
some value to each parameter tolerance. This value must compensate temperature
drift of measured parameters or some unexpected coin parameter dispersion.

1.1.4.2 Status

Coin channel status flags indicate coin recognition and acceptance state.
Each coin channel has 8 flags(*bits*) but just four of them are possible to set or clear in
the program. Other status flags are used for internal factory setting or future use!

ccTalk state flag indicate state of coin acceptance. If flag is set coin acceptance is
enabled. For coin selectors using ccTalk protocol of communication with host
machine(*automate*) this flag is usually cleared, and coin acceptance will be inhibited.
In that case host machine use ccTalk instruction: **231, "Modify inhibit status"** to
enable or disable acceptance during the operation.

Sel flag indicate active selective inhibition of channel. Selective inhibition is used in
coin selectors with selective inhibit input or when DIP-sw is used to toggle this bit.
User can use separate group of coins(*one with selective inhibit on*) for acceptance
and select them with DIP-sw position change or with inhibit input change.
Separate group could have different tolerances or it could be a different currencies.

Fake indicate that this coin must not be accepted but must be recognized and
analyzed. It is set usually for so called "fake" coins, or coins with parameters similar
to valid coins that are programmed. Parameter values with tolerance span are
overlapping with valid coins[20]!

Enable flag indicate that channel will not be used in recognition process.
It is almost same as channel is not programmed even if all other data are.
This is the fast way to "erase" coin channel but save its data in coin selector memory
for future use. Setting back enable flag, channel will be treated like normally
programmed channel.

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18 See details in Coin programming, chapter 4.2.6
19 Self programming or Teach mode
20 See details in Coin programming, chapter 4.2.6.

4.1.4.3 Options

Optional data(*options*) are used to: describe coin, set its value and sorting direction.

Sorting direction
For each coin(*channel*) it is possible to program initial sorting direction. For coin selectors using ccTalk protocol in communication with host machine, this direction is possible to change with command: **210, "Modify sorter paths"**. Usually this value is **1**, coin is directed to "cash box" but change of direction is enabled. If direction is programmed with value **0**, sorting is disabled(*no sorter*).
Maximum possible number of direction is 8, but program will allow values according to the sorter selected before on Configuration page[21]. Selection is done from fall-down menus.

Coin description
Coin description is used as a "coin ID" description in ccTalk instruction: **184, "Request coin id"**. This instruction return to host 6 bytes ASCII string representing:

- Country code
- Coin value
- Mint issue

Country code is presented with 2 characters according to **ISO 3166-1-A2**[22].
In this fall-down menu user can select just 3(*4*) different country codes programmed in coin selector configuration page. ASCII code **'..'**(*hex 2E2E*) is always last one in menu and is used for non programmed or fake coin channels!

Coin value is presented with 3 ASCII characters selected from fall-down menu.
Value marking is standardized and not possible to change[23].
Example: marking for 2 € will be **'200'**, and marking for 50 cents will be **'050'**.

Mint issue is used for coins with same value and country code but with different recognition parameters(i.e. *new and old coins still in circulation*).
From fall-down menu it is possible to select characters: **'A'**, **'B'**, **'C'** or **'.'** for non programed or fake coins.

Instruction: **185, "Modify coin id"** can be used to change partially coin description. Details are explained in coin selector technical manual.

Relative value
It is optional coin value used when coin selector is configured to activate output or outputs on accumulated value(*credit value or price*). It is possible to write any value from 0 to 255. It is recommended to use maximum value of 200.
Coin channels that are not programmed, will have this value value 255.
Value 0 is usually used for fake coins!

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21 See chapter 4.1.5 Configuration
22 See details in Technical manual for coin selector chapter 6.5.2.31.
23 See details in Technical manual for coin selector chapter 6.5.2.31.

4.1.5 Configuration

Coin selector configuration dialog is used to present and modify I/O(*Input/Output*) settings and optional data settings. Mostly this data are user free for writing and reading except in some special protected version[24]. To make I/O programming easier for user that are not familiar with coin selector data organization, some preprogrammed versions are possible to select from fall-down menus on the top left corner of this page. After data upload from file or coin selector memory, programming software will recognize one of the standard configuration and display it with other optional data. Name of configuration will appear in small fall-down menu window. If configuration does not correspond to any of preprogrammed setting name of configuration will be **"Custom"**. If all I/O data are erased than note: **"Not programmed"** will be displayed(*empty page*). For user that are familiar with coin selector memory organization and function it is possible to change I/O and other user setting by editing the coin selector "xml" data file[25] or enabling I/O Edit(*checkbox*). Example of "Not programmed" coin selector is shown on image 4.1.7.
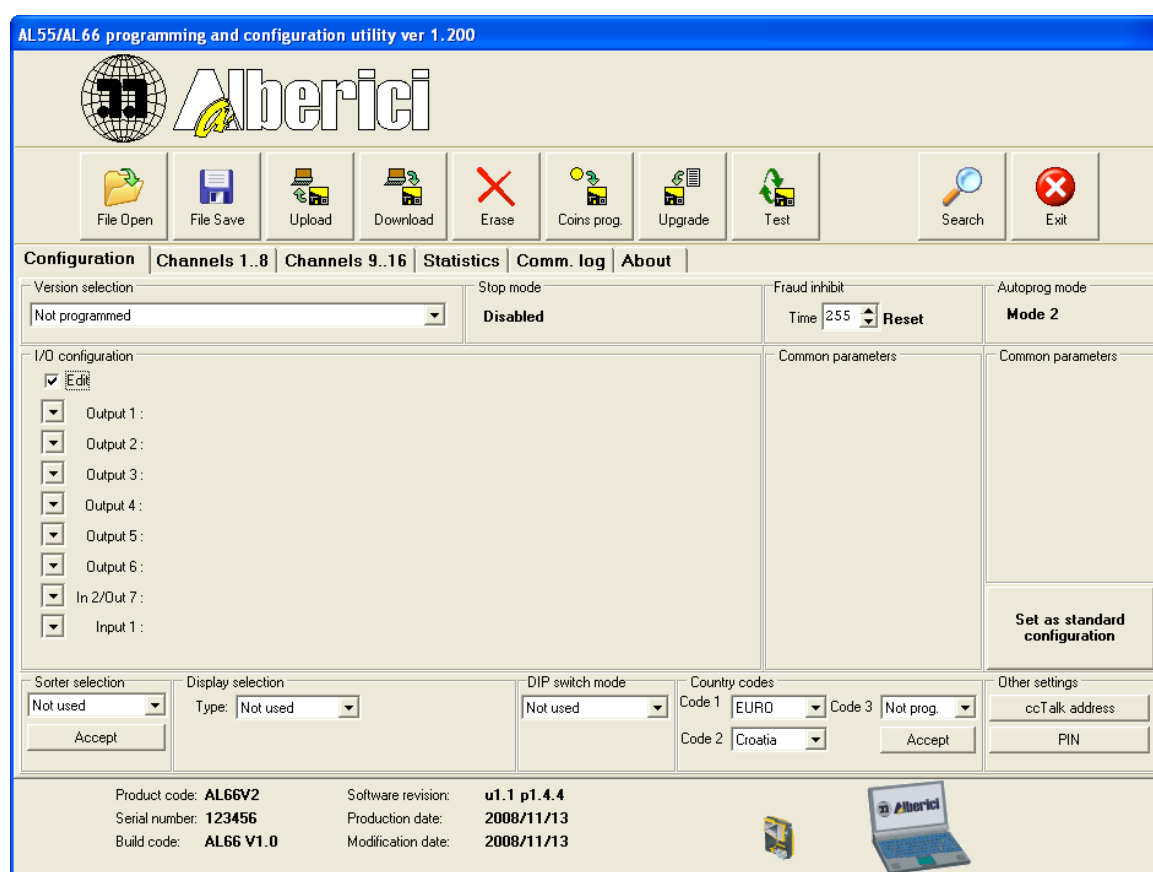
Img. 4.1.7   Configuration panel for "Not programmed" coin selector

After setting of I/O configuration it can be saved as new standard configuration for future use. To save this configuration pres the right button:
[Set as standard configuration]
It is not possible to change function of DIP-switches or display before setting an I/O, as they are related with I/O configuration settings.

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24 Protected version for Italian hazard games
25 Similar as for coin selectors AL05-06

Configuration panel is divided in several separated parts:

- Version selection
- Optional settings(Selfprog mode, Stop mode, Fraud inhibit)
- DIP-sw mode selection
- Sorter selection
- Display selection and settings
- Country code selection
- Other settings(ccTalk address, PIN-a)
- I/O modification

The most important group of data are:

- Input/Output(*I/O*) settings
- Common parameters(*two panels*)

4.1.5.1 Version selection

Preprogrammed version of coin selector are selected from fall-down menu.
All this version must be described and listed in initial file **al66.ini**. Data can be modified and updated with new versions with respect to the rules that are not explained in this document. Currently there is 14 versions of coin selectors:

- Parallel validator
- Combinatorial validator
- Totalizer(*Mod 1*)
- Totalizer(*Mod 2*)
- Totalizer(*Mod 3*)
- Totalizer on request
- Timer
- Timer on request(*Mod 1*)
- Timer on request(*Mod 2*)
- Progressive Timer(*Mod 1*)
- Progressive Timer(*Mod 2*)
- Progressive Timer on request
- Dual price(Stepper)
- Multi price(6 price)

Description and details of all basic coin selector versions is possible to find in technical manual of coin selectors(***AL55-66TehMan-vx.x.pdf***). Only most basic information about programmable data are described in next chapters.

4.1.5.1.1 Parallel validator

Parallel validator has 6 outputs that will be activated for short period(pulse) once after each valid coin acceptance. Each coin will activate different output.
After selection of this version, the panel like one on image 4.1.8. will appear.
In this panel it is possible to change time period of output impulse and change the channel which will activate each output. Time is selected with buttons up or down or by writing value in to the small window(*"Time on"*). Value must be between 5 and 1275 ms in 5 ms steps. If different value is written software will accept nearest value. Sorter selection is not enabled because all outputs are used for coin output. If user try to select one of the sorters an error window shown on image 4.1.9.a. will appear. Display selection is also disabled, error window is shown on image 4.1.9.b!

It is possible to select the DIP-sw function as channel or output inhibition.
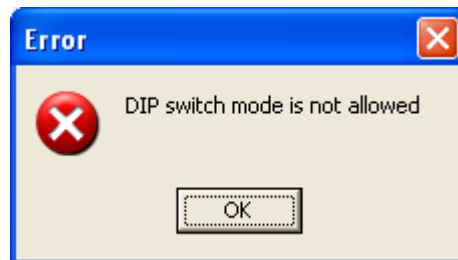If other type of DIP-sw use is selected program will report an error shown on image 4.1.9.c.
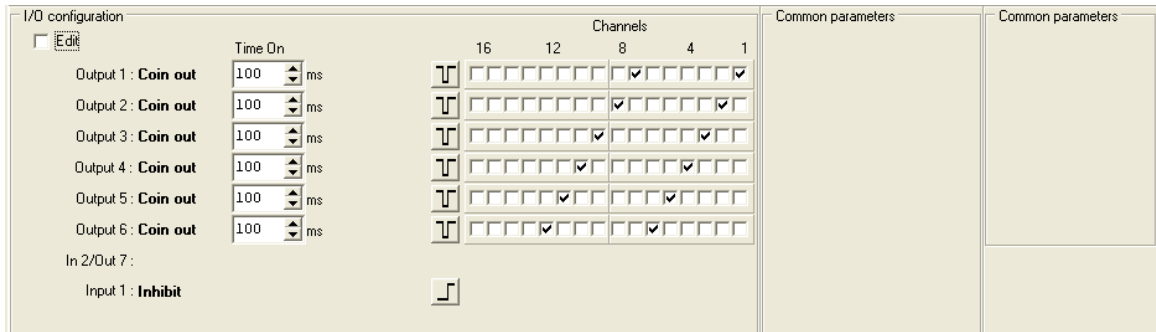
Img. 4.1.8 Parallel validator

Img. 4.1.9.a Sorter error

Img. 4.1.9.b Display error

Img. 4.1.9.c DIP-sw mode error

4.1.5.1.2 Combinatorial validator

It is the modified parallel version of coin interface in which one coin can activate more than just one output. This standard is proposed by EVA[26] as a solution for parallel detection of more than 6 types of coins(*multinational currency*).
Image 4.1.10 show the I/O configuration part of panel.
Timing settings are same as for parallel validator. Output 1 is permanently active and used to indicate combinatorial type of coin selector. Combination of output activation in this case is according to EVA recommendation but it is possible to make different combinations.
Output 6 is used as parity check output and should be programmed according to that. Coins are programmed from channel 1(*2 Euro*) to 8(*1 cent*), panel is shown on image 4.1.10.
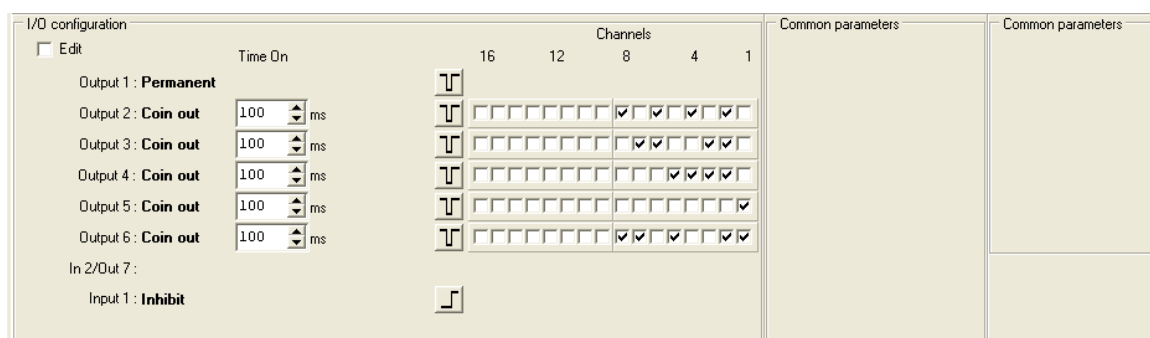
Img. 4.1.10 Combinatorial validator

4.1.5.1.3 Totalizer(*mod 1, 2 and 3*)

Totalizer is type of coin selector with one output for credit activation.
The value of activation is called credit price or just credit. There is several different modes according to the pin output for credit activation and some optional functions.
Mode 1 has output on **pin 5(*out 7*)** like older versions of ALBERICI coin selectors[27] **AL05(06)X**. Mod 2 is compatible with coin selectors COMESTERO **RM4(5)X20** and mod 3 is compatible with coin selectors Money Controls **SR3 Mode 3**.
Example of panels for modes 1, 2 and 3 are shown on image 4.1.11(*a, b and c*).
In this panel it is possible program/change: activation time(***Time On***) and minimum period between two credit impulses(**Time Off**). It is also possible to change credit, bonus level, bonus value and time in Common parameters on the right of the panel.
With DIP-sw it is possible to block acceptance of separate channels(*1-6 or 12*) or set credit(*first bank*) and bonus level(*second bank*).
This type of coin selectors has input(*static*) for acceptance inhibit.
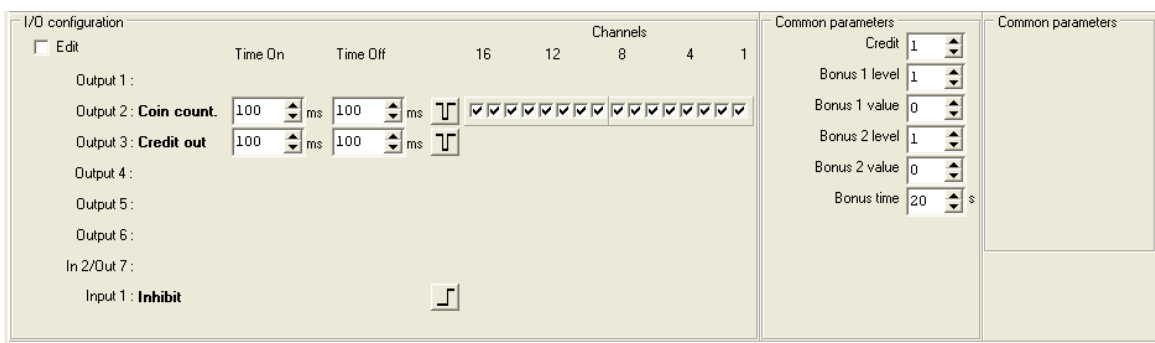In some modes(*2 and 3*) there is also a coin counter output.
Coin counter is counting the relative value of inserted coin. Same as for credit out "time on" and "time off"(*period of pulses*) is possible to change.

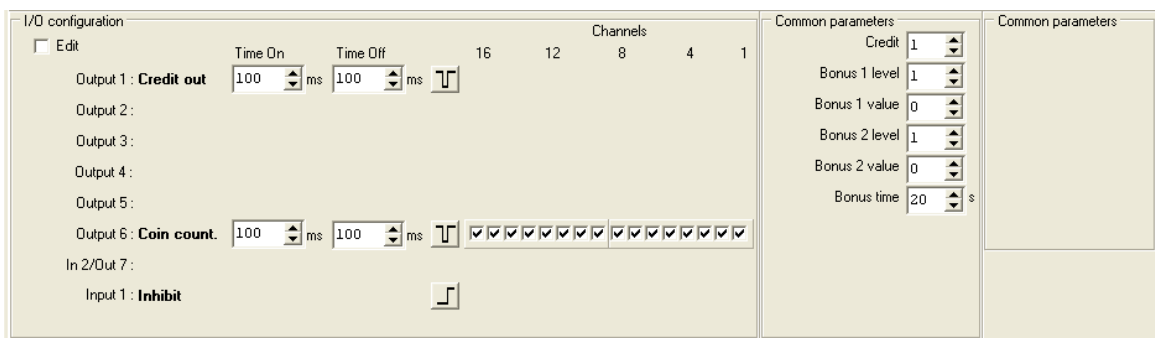26 European Vending Association
27 And first version of AL03 that has only one credit output on this pin!
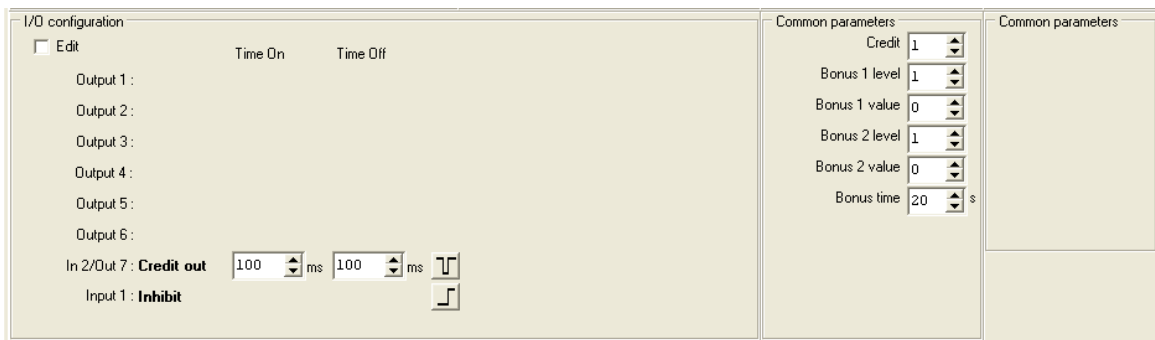
Img. 4.1.11a Totalizer(*mod 1*)

Img. 4.1.11b Totalizer(*mod 2*)


Img. 4.1.11b Totalizer(*mod 3*)

Totalizer support all types of sorter and displays but it can display only accumulated value or rest value after credit activation.

4.1.5.1.4 Totalizer on request

Totalizer on request are activating credit after activation of input "Request credit", if one or more credits are accumulated in coin selector memory. Activation start after return of signal on Input 2(*pin 5*) in normal state(*low level*). Minimum pulse duration is programmed in steps of 5 ms(*default is 50 ms*)
This version is compatible with coin selectors COMESTERO RM4(5)X40.
All other settings are the same as for normal "Totalizer". Part of the I/O and Common parameters setting panel is shown on image 4.1.12.
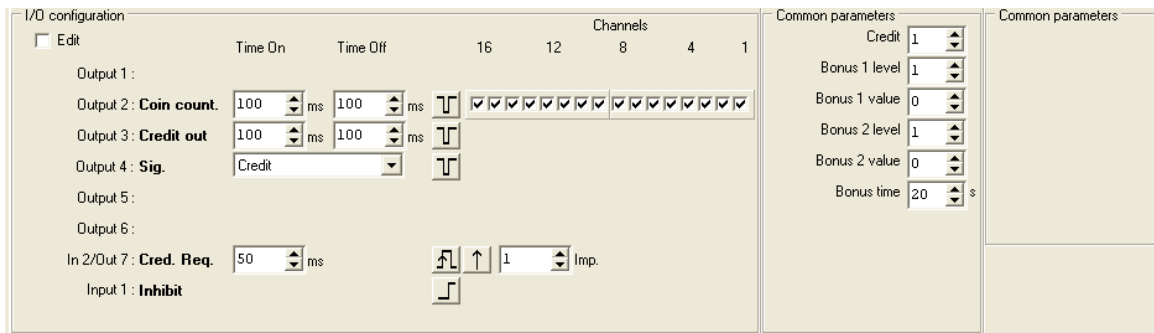
Img. 4.1.12   Totalizer on request

4.1.5.1.5 Timer

Coin selectors that are capable to activate output for longer(*1 s and more*) programmable period are called "Timers". In case of simple Timer single activation will occur after accumulated value has reach the minimum programmed price(value). Time period is possible to program as a product of Time multiplier and basic value of Time output. First program time multiplier in field "Common parameters" and than Time output in steps that will be same as time multiplier.
Multiplier can be programmed in seconds or minutes for long periods.
Selection is done by pressing the radio buttons.
During time output activity coin acceptance is inhibited and eventual rest or value overflow will be saved for next insertion of coins, if "Rest time" is programmed to value 255. It could be cleared after programmable time period(*Rest time = 1 to 254 sec*) or cleared immediately(*Rest time = 0*)!
The biggest coin value should not exceed credit value!
Part of the I/O and Common parameters setting panel is shown on image 4.1.13.
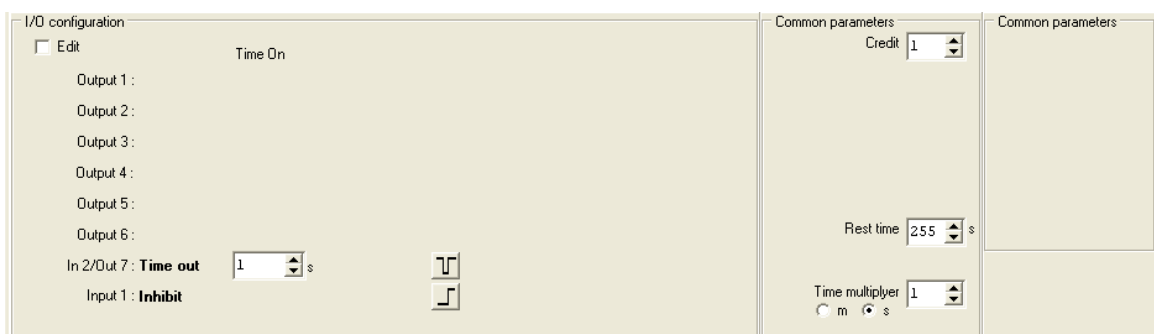

Img. 4.1.13 Timer

Timer coin selectors can use display(*only AL66*) for time and imported value presentation. It is also possible to use all sorters and DIP-sw can be used for: Channel inhibition, credit setting and time multiplier setting.
Addition of credit bonus is not enabled.

4.1.5.1.6 Timer on request(*mod 1 and 2*)

Like "Totalizer on request" a "Timer on request must have input for activation of timer output. Accumulated value must exceed the value of credit or at least one credit must be accumulated. Credit and bonus levels and values are programmed in same way as for "Totalizer on request" and timer output and multiplier is same as for "Timer". Mode 1 is compatible with ALBERICI Totalizers or timers and has output on pin 5. Because of that it use only one input as a combination of "Inhibit" and "Request". Mod 2 is compatible with coin selectors COMESTERO RM4(5)X60.
This type of coin selectors has coin counter output described in previous chapters and output for accumulated credit signalization.
It is possible to display(*AL66*) value, credit and the time.
Part of the I/O and Common parameters setting panel is shown on image 4.1.14.
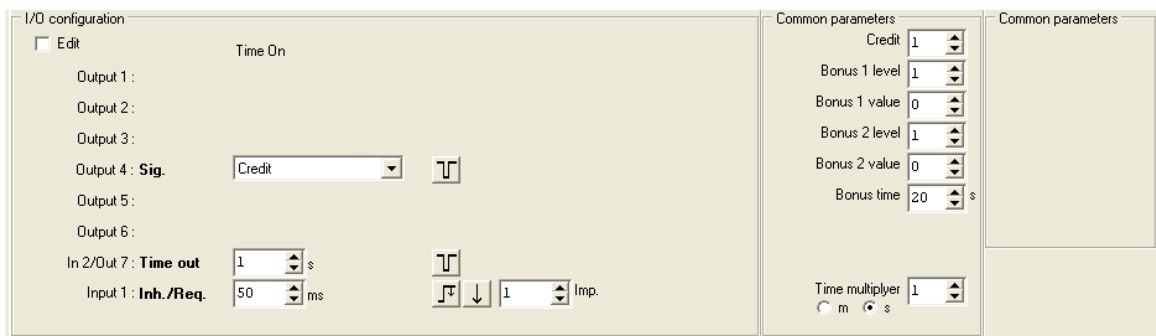

Img. 4.1.14a Timer on request(*mod 1*)
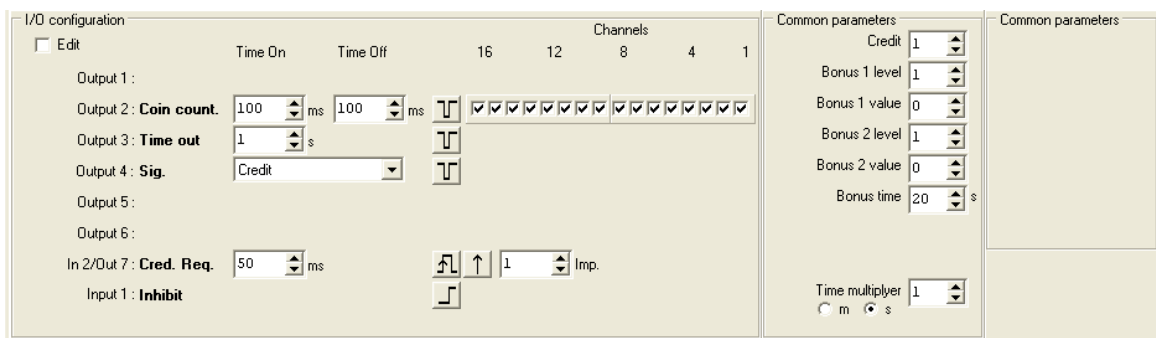

Img. 4.1.14b Timer on request(*mod 2*)

4.1.5.1.7 Progressive timer(*mod 1, 2 and 3*)

Progressive timers are activated when credit price is accumulated. Cumulated value is than calculated and converted in to time period. Time period is product of value and time base programmed for "Time out". During the time activity it is possible to import new value(*coins*) and add more time.
Mod 1 is simple with only one Time out, while mode 2 is compatible with COMESTERO coin selectors RM4(5)X30. Mod 2 and 3 has also output for time running out signalization (*warning*). Warning time can be set in common parameters field but it should be shorter than Time out period. Input can act as Inhibit acceptance and Stop time function(*Pause*). To stop the time one impulse must be applied to input. Restart the time with new impulse(*toggle*). Bonus and time multiplier are not possible to program. I/O and Common parameters setting panel are shown on images 4.1.15
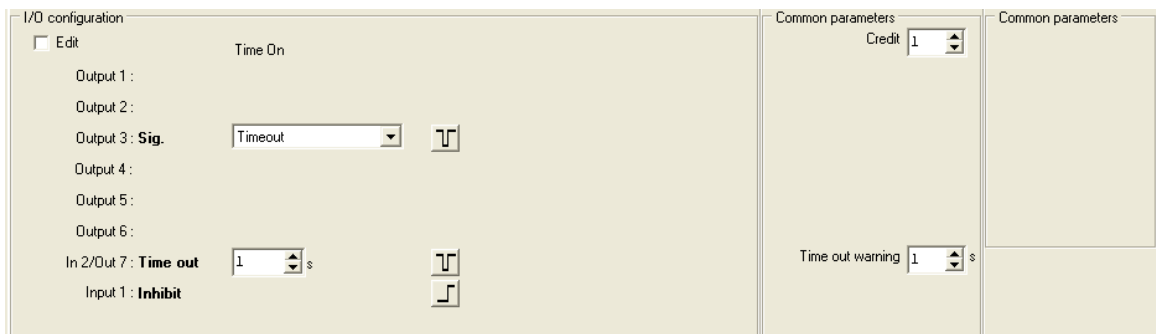
Img. 4.1.15a Progressive timer(*mod 1*)
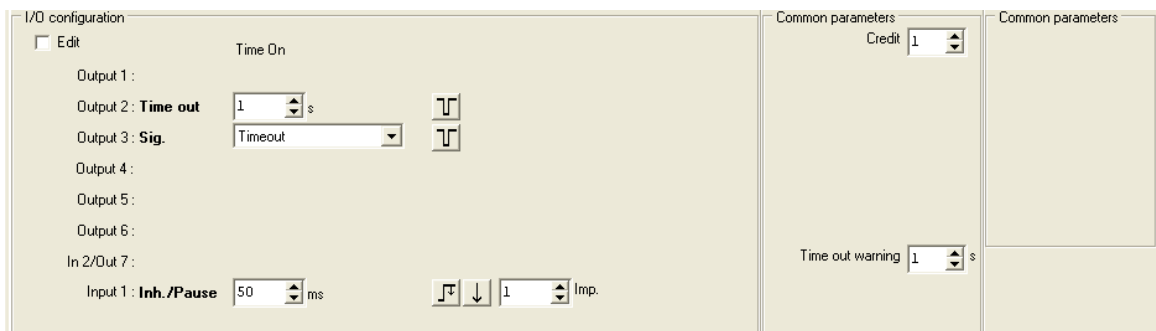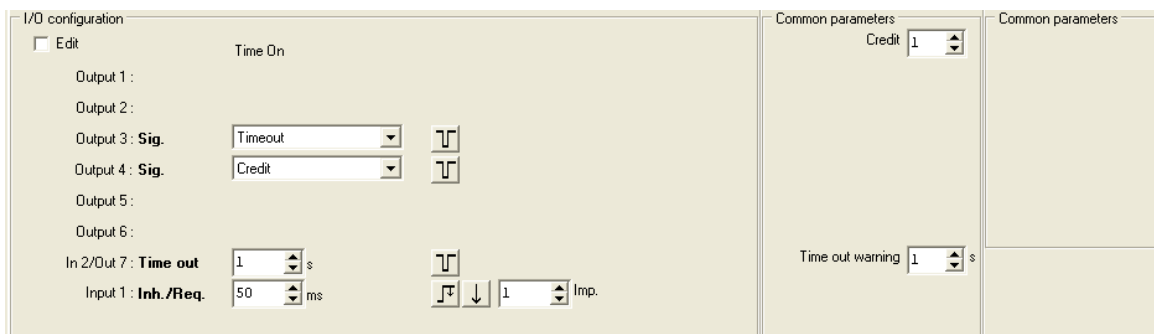
Img. 4.1.15b Progressive timer(*mod 2*)
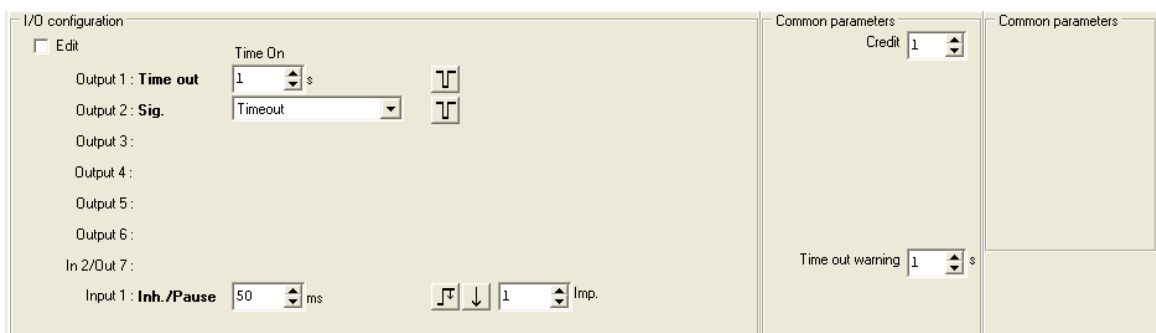
Img. 4.1.15c Progressive timer(*mod 3*)

It is possible to use display for imported value and time presentation. During the time output activity, the new imported value will not be shown but time period will be recalculated and shown on display.

4.1.5.1.8 Progressive timer on request

This is specific type of coin selectors that has combination of timer on request and progressive timer. Time will start after "request" and all other function will be same as for progressive timer. Part of the I/O and Common parameters setting panel is shown on image 4.1.16.


Img. 4.1.16 Progressive timer on request

4.1.5.1.9 Dual price stepper

This type of coin selector is compatible with COMESTERO RM4(5)X10 coin selectors used in vending machines. Outputs will be activated when accumulated value reach the price programmed for that output. Output will stay in active state(*low level*) till the end of vending process. During that process Inhibit/Reset input is active(*high*). Et the end of the process vending machine will change level on the input and active price output will be deactivated. Minimum reset time is set to 50 ms(*default*) to avoid unintentional reset due to some disturbances(*debounce*). It is possible to program longer or shorter period according to machine specification.
The rest of the value after the vending process will activate again one or both line if the value is still bigger or same as the price. If the value is lower than it could be kept for next vending cycles(*Rest time = 255*) or cleared after programed time in seconds(*Rest time = 0-254 s*). During vending cycles acceptance of coins is inhibited. Part of the I/O and Common parameters setting panel is shown on image 4.1.17.
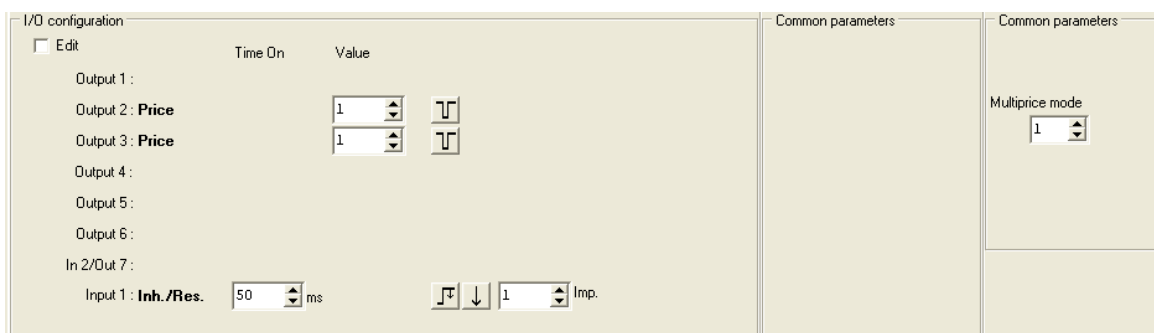
Img. 4.1.17 Dual price stepper

4.1.5.1.10 Multi price(*6*)

This type of coin selector has the same function as the previous one but it has 6 price outputs. Output with lover price will be deactivated when higher price import is reached. Beside that, there is a separate input for acceptance inhibit and for reset. Part of the I/O and Common parameters setting panel is shown on image 4.1.18.
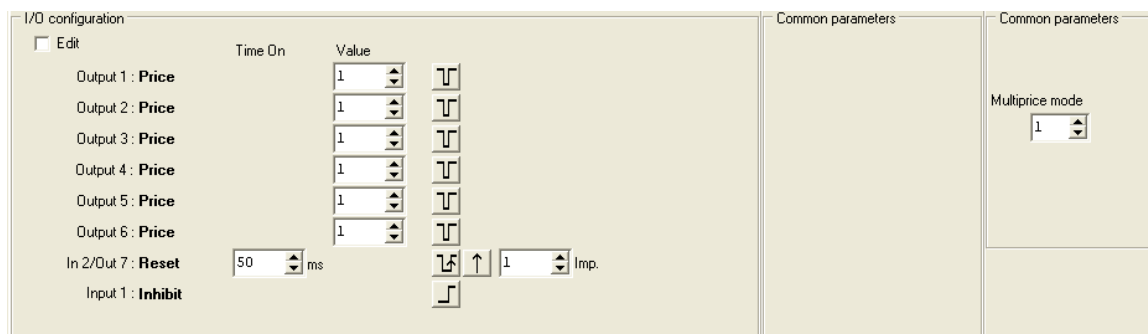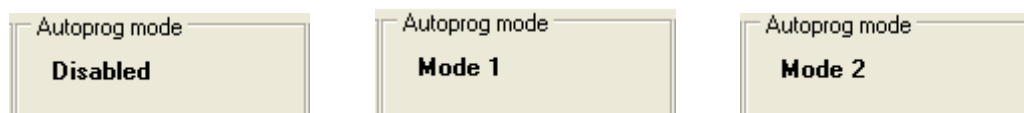

Img. 4.1.18 Multi price(*6*)

4.1.5.2 Additional functions

Additional function is possible to program in any configuration of coin selectors. Additional function are:

- Self programmable mod
- Stop mod
- Fraud inhibition

Self programmable mod must be enabled in factory. Status of self programmable mod will be displayed in field above I/O Configuration(*Left*)[28].

Img. 4.1.19 Different status of self programmable modes

Stop mod must be enabled in factory on customer specific request.
If "Stop mode" is not enabled, sign **Disabled** will be present in middle field.
If Stop mod is enabled Time selection box and mode description will be shown.
Time to go to the power saving mode is possible to adjust from 5 do 254 seconds.
Time shorter than 5 sec. is not allowed because of possible coin selector programming difficulties. **Coin selector in power saving mode do not communicate with host!**
It is a good practice to program stop time to exact value at the end of programming.
It is also necessary that one should be able to wake up coin selector from this mode.
Mod 1 use pin 6 for wake up and mod 2 use coin insertion(*any coin*).
If time is set to maximum value of 255 stop mode will be disabled!

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28 For details see technical manual of coin selectors

Img. 4.1.20 Different Stop mode configurations

Fraud inhibit is possible to program in all configurations of coin selectors.
After detection of wrong direction of coin(*jojo fraud*) at the credit sensor this coin will not be registered as valid(*no credit*). This is usually case when somebody try to insert the coin on the wire and than pull him back. To make this fraud even more difficult coin acceptance will be inhibited after such event for time period programmed in the field "Fraud inhibit". time can be set from 0(*no inhibition*) to 254 seconds.
If value is set to maximum of 255 than inhibition will last till one correct coin is inserted(*Reset coin*). The reset coin will not be accepted.
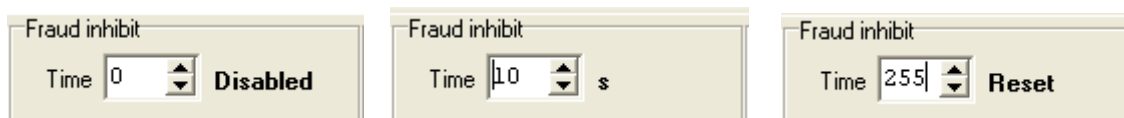

Img. 4.1.21 Fraud inhibit time settings

4.1.5.3 DIP-switch modes

User can change and select different DIP-sw modes. Because some of the this settings might not have any influence or even cause unexpected behavior of coin selector, selection is limited by the software according to I/O configuration!
In that case an error message like one on the image 4.1.9.c will appear and DIP-sw mode will remain "Not used"..
Selection is done from fall-down menus shown on image 4.1.22.
There are 7 different DIP-sw modes[29].

- Inhibit output
- Inhibit channel
- Credit
- Credit + Bonus
- Price 1 + Price 2
- Time multiplier
- Credit + Time mult.

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29 See Technical manual for coin selectors AL55-66
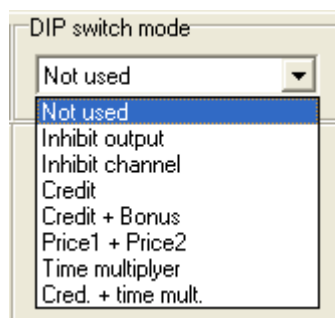
Img. 4.1.22 DIP-sw selection

When coin selector has only one sw bank only function of sw1 will be available an other bank will act like all switches are in "off" position.
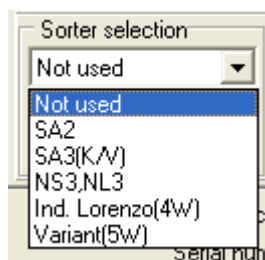
4.1.5.4 Sorter selection

Sorter is simple electro mechanical device mounted on coin selector, and connected to coin selector outputs. Standard connection use: **pin 4(out 6)**, **pin 3(out 5)** and **pin 10(out 4)**. Most of coin selector configuration optionally can have sorting function except if output is used by other function.
Sorter selection is done from "fall-down" menus shown on image 4.1.23, below the DIP-sw mode selection. After sorter selection press the button **[Accept]** to confirm selection. If sorter is not possible to select error message like one on image 4.1.9.a[30] will appear. Available sorters are:

- SA2
- SA3(*K/V*)
- NS3, NL3
- Ind. Lorenzo(*4W*)
- VARIANT(*5W*)

If sorter was present in configuration it could be removed but outputs occupied for sorter coil drive will remain unused. In case of validator this will leave last two output unused. To use again this outputs close and open the program and select again validator type!

Img. 4.1.23   Sorter selection

Note:
Sorter selection is enabled only if configuration is loaded from file or coin selector in to the program buffer.

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30 See chapter 4.1.5.1 I/O configuration

When data are loaded from coin selector, sorter type will not be recognized but it will be enabled! The reason for that is because some of the sorters has identical sorting coil activation mask but different timing settings that customer can change!
If you are not sure which type is programmed, select sorter again!

4.1.5.5 Display selection

Display selection is done from "fall-down" menus shown on image 4.1.24.a, below the Sorter selection. If configuration is not loaded or selected this menu will not be present in configuration panel. If display is not possible top use in selected configuration an error like one shown on image 4.1.9.b. will appear.
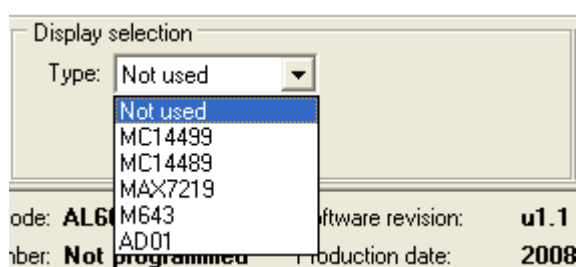
Img. 4.1.24.a Display type selection

Coin selectors AL66xx(*not AL55xx*) can be connected with 5 types of displays. The connection is done through 6 pole connector on coin selector PCB.
Display types are:

- MC14499
- MC14489
- MAX7219
- M643
- AD01

MC14499 is the marking of integrated circuit used in older 4 digit 7 segment LED displays with SPI(*Serial Peripheral Interface*) like coin selector RM4 from COMESTERO.

MC14489 is the marking of integrated circuit used in 5 digit 7 segment LED displays with SPI like displays for G13 from NRI.

MAX7219 is the marking of integrated circuit used in 6 digit 7 segment LED displays, ALBERICI type AL05D1.

M643 Is the marking of LCD display module with 8 digits from "Orion", used with coin selectors ALBERICI type AL06x.

AD01 is new 2x16 characters, "dot-matrix" LCD display module with background light and power saving mode of operation. This display can show also some messages. When one of the display types are selected the new "fall-down" menu shown on image 4.1.24.b appears.
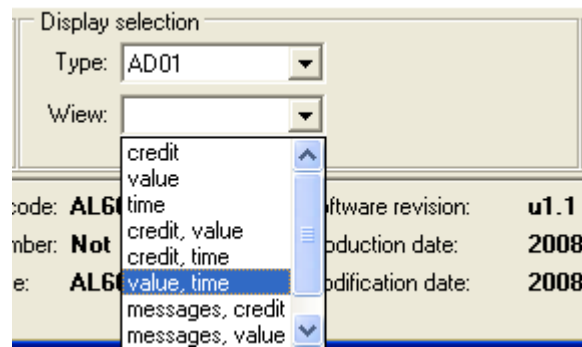
Img. 4.1.24.b Data view selection

According to the display type and configuration we must select the data that will be shown on the display.
Data that are not possible to show on that type of display or in that configuration will not be present in this menu.
Only for presentation of imported value or rest it is necessary to adjust some optional data. This menu will appear automatically under "view" selection window.
Coin value some time has relative value compared to the lower programmed coin that can be programmed with value of 1. Beside in the presentation of small coins decimal places are often used.

Example:
Coin selector has programmed coins of 50 cents with value of 1. Coins of 1 and 2 Euro must have value of 2 and 4. To display a realistic imported value value of coins must be multiplied with 50 and 2 decimal places must be set.
For one 50 cent coin, display will show: **0,50**.
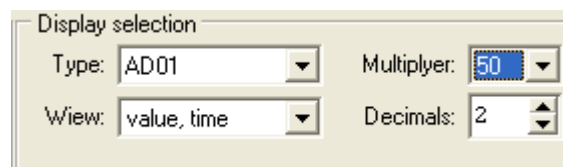
Img. 4.1.24.c Value presentation adjustment

4.1.5.6 Country codes

For some coin selectors country codes are not mandatory, but they are used in ccTalk
communication of coin selector wit host. Our coin selectors can have 3 different
countries codes programmed at he same time. When coins are programed, one of
this codes can be selected as a coin designation.
Country codes are according to ISO ISO3166-1-A2 standard. When coin is not
programmed code is: '..'. Press the button **[Accept]** to write new codes in to the
program memory buffer. To save this data in to the memory of coin selector
"Configuration" data must be saved(*Downloaded*).
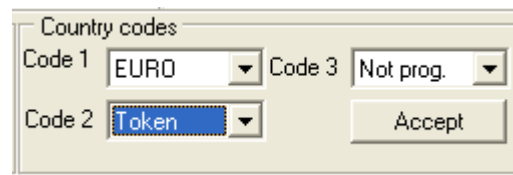
Img. 4.1.25 Country codes selection

4.1.5.7 Other settings

This setting are address and PIN change. Address and PIN change are accessible to
user only through special ccTalk commands and this data are not part of user data
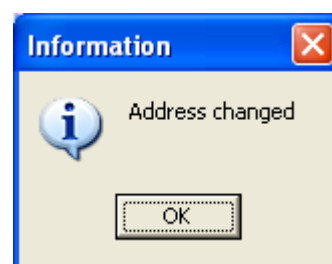block(*Configuration*). To change this settings pres one of the buttons shown on image
4.1.26.

Img. 4.1.26 Address and PIN change

ccTalk address change
Default ccTalk address of coin selector is 2. Address can be changed in to any address
between 2 and 255 in . After pressing the button the new dialog window shown on
image 4.1.27 will appear. Press OK to accept the new address. The new address will
be written in to coin selector NV memory and used as new address in the further
sessions. Information message like one on image 4.1.28 will appear on screen.
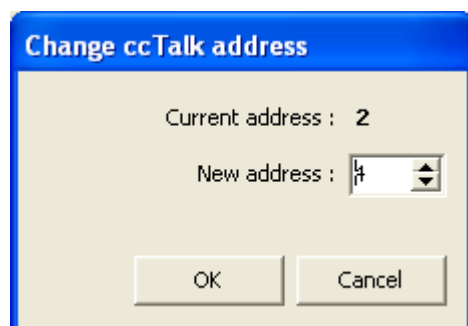
Img. 4.1.27 Address selection   Img. 4.1.28 Confirmation info

PIN change
User PIN is used in coin selector to protect user statistic counters manipulation or cancellation(*erase*).
Initially PIN is **0x00000000** and if user want to protect statistic it must be changed.
Save new PIN on safe place or remember it!
Forgotten PIN recovery is possible to perform only in factory but all counter data will be reset to zero.
Pressing the button **[Change PIN]** will open new dialog window shown on image 4.1.29.
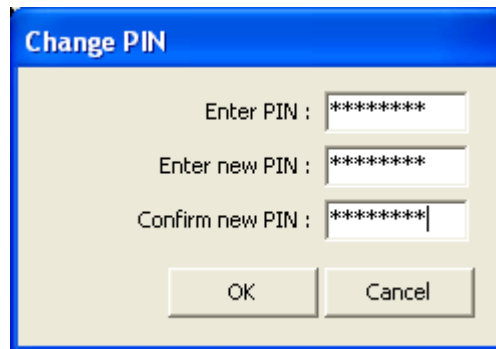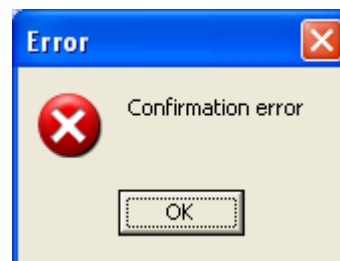

Img. 4.1.29 Change PIN dialog

In case of error, an "Error" window will appear.
Possible errors are: "Wrong password"(*img. 4.1.4.a*), "Incorrect password length"(*img. 4.1.4.b*) or there was an error in confirmation of new PIN.
In that case an error window shown on image 4.1.30 will appear.

Img. 4.1.30 Confirmation error

If PIN change was correct an information window like one on image 4.1.5.a will appear..

**New address and PIN will be saved in NV FLASH memory of coin selector!**

4.1.5.7 I/O modification

When I/O configuration checkbox is "on" Each input or output can be programmed by the user acording to some rules that user must be familiar with or programm will automaticaly set the warning mesage and disable that function.
Selection of different function is done from fall down menu that is present at each output or input. For output it is possible to select 18 different settings:

- Not used
- Parallel output(single pulse)
- Parallel output(Spanish protocol)
- Parallel multi impuls output(Coin counter)
- Sorter output
- Credit output
- Credit on request(single)
- Credit on request(multipl.)
- Timer output(single)
- Timer output(multipl.)
- Timer on reqest(single)
- Timer on reqest(multipl.)
- Progressive timer
- Progressive timer on reqest
- Price output(static)
- Price output on request
- Warning output(static)
- Permanently active

Example of fall down menus for first output is shown on image 4.1.31
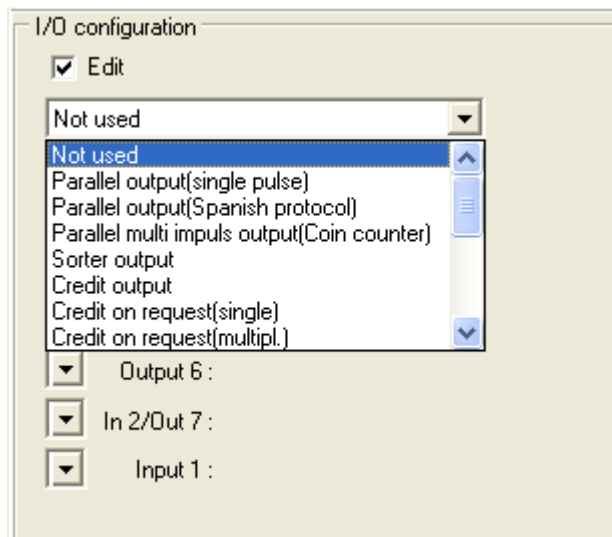
Img. 4.1.31 Selection of outputs

Some of the outputs can't be select if there is conflict and software will open a warning message to the user, like one on the image 4.1.32.
Conflict is some time if there is other type of output that has the same source of activation. For example it is not possible to have one credit pulse output and timer output at the same time! Some time the input activation function must be selected first(Reqest or Reset) or warning message like one on the image 4.1.33 will appear.
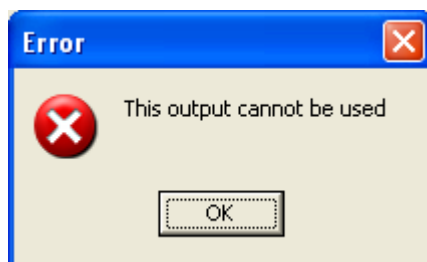
Img. 4.1.32 I/O Conflict warning
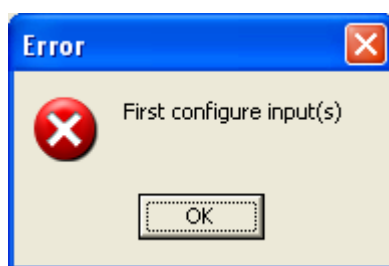
Img. 4.1.32 Input not programmed warning

This manual will give only short description of each type of output.

Not used output is when all output data are erased(*read as 0xFF*).

Parallel output(single pulse) is output activated once when a coin passes the credit optical sensor(*accepted coin*). It is used in parallel validator.
For each output it is possible to set different coin activation mask.
Multiple output and multiple coin activation is also alowed.

Parallel output(Spanish protocol) is output activated twice. First time for short fixed period of 10 ms after coin recognition and second time same like a parallel output, after a coin passes the credit optical sensor(*accepted coin*).

Parallel multi impuls output(Coin counter) is activated in the same way as the parallel output but number of activations will be according to the coin relative value.
To use this output for driving the coin counter all coins must activate this output.
This type of output is some times used for "parallel multi pulse coin selector".

Sorter output is activated once just before coin reach credit optical sensor and deactivate after programmed time. It is usualy used to drive coils for simple electromechanical sorter mechanisym. Direction activation mask must be correctly programmed for each sorter type! Usualy outputs 6, 5 and some time 4 are used for coil drive. The easiest way to program sorter is to select one from separate menu.

Credit output is output activated for programmed pulse period when accumulated value is biger or same as credit value. Multiple activation is possible. Time period betwen pulses is possible to program. It is possible to have only one output programmed for that function. Other outputs activated on accumulated value are not alowed!

Credit on request(single) is pulse output activated if accumulated value is bigger or same as credit and request input is activated! For each output pulse the request input must be activated again. Input must be programmed first!

Credit on request(multipl.) is pulse output activated same as credit output but after request input has ben activated. One request activation will activate all credit pulses.

Timer output(single) is activated for programmable time period when accumulated value is bigger or same as credit. This type of output will be active for one time period even if accumulated value is multiple value of credit. Coin acceptance will be internaly disabled during time activation to avoid loss of value.
It is also possible to have only one timer output, and there must not be any other outputs activated on value.
Timer output(multipl.) is activated for one or more programable periods when accumulated value is bigger or same as credit.

Timer on reqest(single) is activated same as credit on request, but the output will be active for programmed time period. This is mostly used timer output!

Timer on reqest(multipl.) is activated in same way but timer period could be multiple if accumulated value was bigger or same than two credits.

Progressive timer is activated for programmed time period when accumulated value is same or bigger than credit. If new coin value is inserted during the timer activiti the time period will be extended for period proportional to that coin value.

Progressive timer on reqest is activated when accumulated value is bigger or same as credit and request input is activated. After time output activation it will act same as normal progressive timer.

Price output(static) is activated when acumulated value is bigger ir same as programmed price. It will remain active till sales reset input is activated.
Input must pe programmed first! It is possible to program multiple output as price output. According to the multiprice mode there is some diferences in activation and deactivation of outputs. When mode 0 is selected all activated outputs will remain active till reset. when mode 1 is selected outpots with lower price will be deactivated when higher price output is activated. When highest possible price is active coin acceptance will be disabled. Mode selection is presented in "Common parameters" on image 4.1.8.

Price output on request is same as price output but activation will be after request input is activated. Both reset and request inputs must be programmed before!
It is some time used for fotocopy machine function. Number of reset pulses is possible to program to be from 1 to 255. Price output will be deactivated after input of **N** reset activation pulses.

Warning output(static) is used as signal output for different coin selector states. Example of **Credit** and **Timeout** signalization is on image 4.1.12/14/15/16.
It is also possible to signal the **Rest** value or alarm warnings **Jojo**, **Coin jamm** or **General fail**.

Permanently active is output that is active during the coin selector power on.
It is used as signalization for special coin selector mode or as indicator that coin selector is not in the "Power saving mode"(*Stop mode*).

Coin selector has also one input(*pin 6*) and one pin(*pin 5*) that can be programmed as input or output. Selection is from fall down menu shown on image 4.1.34.
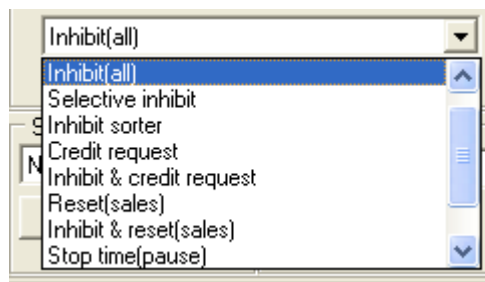
Img. 4.1.34 Input selection

Input can be programmed as:

- Not used
- Inhibit(all)
- Selective inhibit
- Inhibit sorter
- Credit request
- Inhibit & credit request
- Reset(sales)
- Inhibit & reset(sales)
- Stop time(pause)
- Inhibit & stop time
- Input counter

Not used input is when all input data are erased(*read as 0xFF*)

Inhibit(all) is static input that is used to block all coin acceptance when is active.

Selective inhibit is static input that is used to block acceptance for group of coins that has programmed selective inhibit status bit.

Inhibit sorter is static input that is used to block(*turn off*) sorter coils.

Credit request is static or usualy pulsed input used to activate credit(*or timer*) output. Pulse activation can be made when signal is activated or deactivated. Minimum time pulse or delay is programmable.

Inhibit & credit request is a combination of static Inhibit function and pulsed Credit request function described above but programmed at the same input.

Reset(sales) is usualy pulsed input used to deactivate Price outputs after sales has been completed.

Inhibit & reset(sales) is a combination of static Inhibit function and pulsed reset function described above.

Stop time(pause) is static or pulsed input used to Stop the timer count down. When pulsed type is selected than stop function is toggled.

Inhibit & stop time is a combination of static Inhibit function and pulsed Stop time function described above.

Input counter is pulsed input that is used to insert value in to coin selector without insertion of coins. This input can count pulses and multiply them or divide them to enable connection of different serial protocol devices with coin selector. For example that could be Banknote reader.

Polarity of all Inputs and Outputs can be changed pressing the button for polarity.
Sybols on buttons for polarity change are presented on image 4.1.35.
First image is standard polarity(*Low*) and second is revers polarity.

Img. 4.1.35 Output polarity change(*pulse*)

Static input signal polarity change is presented on image 4.1.36.
First is standard High level activation and second is Low level activation.

Img. 4.1.36 Polarity change(*static*)

For pulse input phase can be selected with button placed near the polarity button. There is four different combination for polarity and phase for pulsed inputs shown on image 4.1.37. First is high level activation on pulse low to high change. Second is high level pulse on high to low change. Next two examples are for low level pulse on high to low change and low to high change.

Img. 4.1.37 Input polarity and phase change(*pulse*)

For combination of static Inhibit and pulse input change there is also four different combination of polarity and phase. Examples are shown on image 4.1.38.
First two images are for static function(*inhibit*) standard high polarity and secondary function change from low to high aand from high to low .
Next two images ar for static function with low polarity and secondary function high to low and low to high change.

Img. 4.1.38 Input polarity and phase change(*combinatorial*)

For all pulsed inputs usualy one pulse is programmed but in some cases user can select different number of pulses to activate the function!

4.2 Tool bar

Above tabbed pages there is a tool bar with 11 buttons for activation of different function. Each function has its own program dialog window. Button are:

- File open
- File save
- Upload
- Download
- Erase
- Program coins
- FLASH Upgrade
- Test(*User*)
- Factory test
- Search
- Exit

4.2.1   File Open

This button is used to select coin selector data file and download this data in to main program memory buffer. Pressing the button will open the system dialog window **Open**, as shown on image 4.2.1[31].
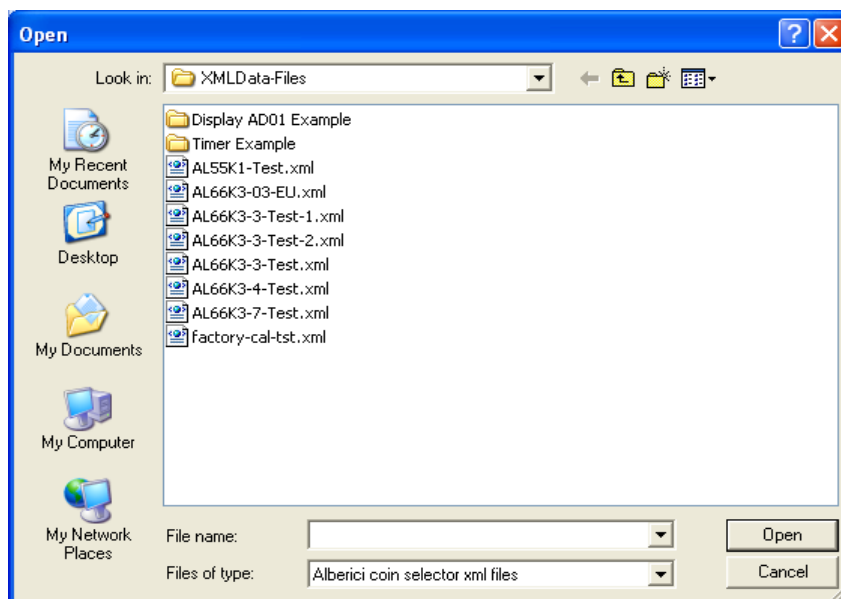

Img. 4.2.1 System dialog for file selection

Coin selector data files has extension **.xml**. and only sub folders and files with corresponding extension will be present in this dialog.
Data files has internal check code to distinguish this data files from older version of .xml files for AL05/06. In case of mismatch an error message shown on image 4.2.2 will appear.

---

31 System dialog are using language settings of your OS!
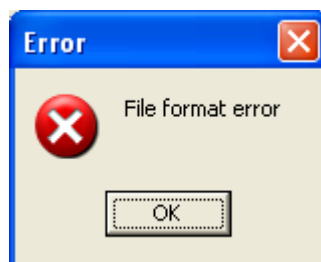
Img. 4.2.2 File format(*xml*) error

Data in this files are grouped as:

- CHANNELS(*coin data*)
- STATISTICS
- CONFIGURATION
- FACTORY DATA

The group of data CONFIGURATION is divided in two sub groups:

- INPUT/OUTPUT
- USER DATA

The group of data STATISTICS is also divided in two sub groups:

- STATISTIC SETTINGS
- STATISTIC COUNTERS

After the file selection, new dialog window will appear on screen. In this new dialog window we can select: all data, groups or individual data. Selection is done by double click in check box for data or group. Some files has only partial data.
The data that are not present in the file it is not possible to select or deselect[32].
Example of file containing only coin channel data is on image 4.2.3.
Files can be edited with simple text editors and data can be added or removed from file to create specific customer files download specified data in to coin selector memory.
When data are removed or added in to xml file, some rules must be followed to preserve correct file format(*structure*).
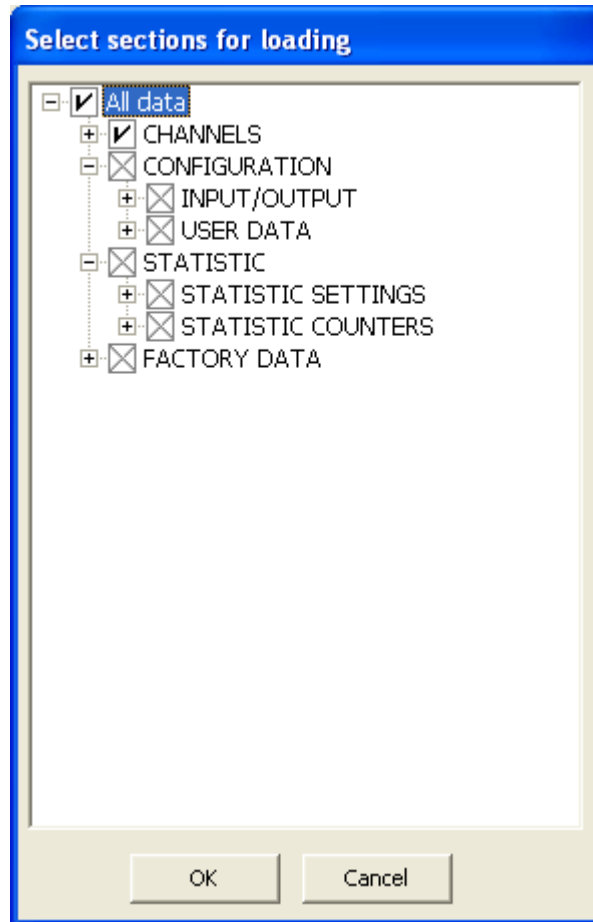There is two way to erase separate data from file. First by erase only data field(*empty data field*) like in first row of example below. After erase of data there must be no space between signs ><.
Second way is to remove whole data line from file.
Example of two channels record with data of first channel erased:

```
<Data caption="CHANNEL 1" address="0x0600" length="16"></Data>
<Data caption="CHANNEL 2" address="0x0610" length="16">84746C37008008070907040370014802</Data>
```

---

32 Grey cross in check box

Img. 4.2.3. Data selection from file with coin channel data

Press the button **[OK]** to transfer selected data or group in to the program buffer.
Transfered data will change the presentation of this data in menus(*panels*).
All other data will remain intact.
Keep in mind that data are not yet transfered in to coin selector memory.
To do that user must press the function button **[Download]** described in chapter
4.2.4. Button **[Cancel]** will close this dialog window with no change.

4.2.2 File save

Data from program buffer can be saved on PC by use of tool bar button **[File save]**.
Before that there must be some data(*minimum one*) in program buffer.
Attempt to save data immediately after opening the program, when no data is loaded
in to program buffer will cause the error message like one shown on image 4.2.4 .
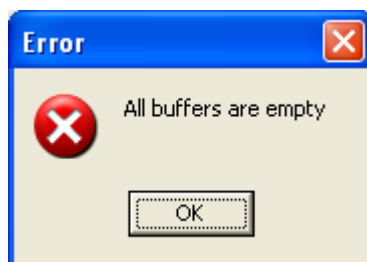
Img. 4.2.4 No data in program buffer

After pressing the button **[File save]**, a dialog window same as one on image 4.2.3 will appear. Select data or group of data or all data to be saved and pres the button **[OK]**. System dialog "Save As" similar to the one on image 4.2.1 will appear.
Write the name of the file to save or select one of existing file(*overwrite*) and press the button **[Save]** to finish the task.

4.2.3 Upload(*data from coin selector*)

Button **[Upload]** is used to load the data from coin selector in to the program memory buffer. It open the dialog window same as the one on image 4.2.3.
All data are available[33] for upload, but user can select only one group or separate data to upload(*faster*).
During upload of data pointing device(*mouse arrow*) will change state in to sand clock and all functions are disabled.
When all data are read without error an information message like one on image 4.1.5.a(*chapter 4.1.3*). In case of error, a message like one shown on image 4.2.5 will appear.

Img. 4.2.5   Data reading error

4.2.4 Download(*data to coin selector*)

Data from program buffer can be downloaded in to coin selector memory with button **[Download]**. After that the dialog window like one on image 4.2.3 will appear. All data uploaded from coin selector or file in previous session will be enabled and checked for download. Select the data to download and press the button **[OK]** to save this data or **[Cancel]** to quit without save.
Program buffer must not be empty!
Some parts of coin selector memory can be protected and if they are selected, user must insert password or PIN prior to the write.
Statistics settings are protested with user PIN, and factory data are protected with

---

33 Program use template file created after installation with list of all data!

factory password[34]. In some special cases coin selector user and coin data can be protected to[35]
Before writing, PIN(*chapter 4.1.3, img 4.1.3*) or Factory password dialog window will appear.
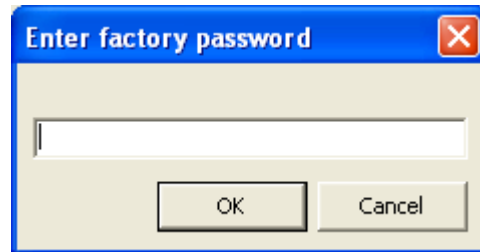
Img. 4.2.6 Factory password

Important notes!

Factory data are protected with factory password, deselect or erase this group from file to download !

Statistics settings are protected with user PIN!
Statistic counters are not possible to write, deselect or erase this group from file to download or an error like one on image 4.2.7 will appear!
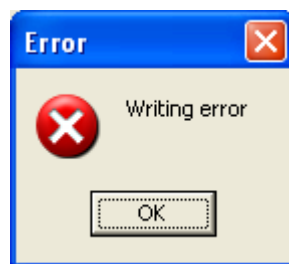
Img. 4.2.7 Writing error

---

34 Sensitive data that must be changed only by trained expert!
35 Coin selectors for Italian gambling machines

4.2.5 Erase

Press the button **[Erase]** to erase two groups of data: channels and statistic counters. The new dialog window like one on image 4.2.8 will appear.
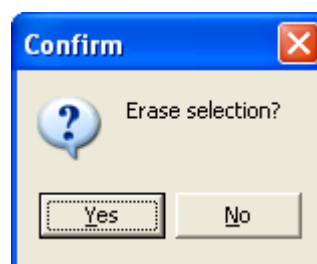

Img. 4.2.8 Channel and statistic counters erase

Selection of data to erase is done with mouse click in to check boxes of separate data or whole group of data(***All***). Selection of channels is on the left field "Select Channels" and statistic counters on the right field "Select Statistic".
After that initiate erase with button **[Erase]**. Button **[Close]** will close this window with no action.
If we press the button **[Erase]**, the new window dialog(*confirmation*) will appear.
Pres **Yes** to confirm erase or **No** to quit without erase.

Img. 4.2.9 Confirm erase

Statistic counters are protected with user PIN and if PIN was not inserted before the PIN insertion dialog like one on image 4.1.3[36] will appear.
In some cases even channel data could be protected with factory password.
In such case erase of coin data will not be possible.

---

36 see chapter 4.1.3.

After successful erase information window like one on image 4.1.5.a(*chapter 4.1.3*) will appear.
All coin data will have value **0xFF**(*hexadecimal*), while all statistic counters will have value **0x000000**(*hex*).


4.2.6 Coins program

Button **[Coins prog.]** will initiate coin recognition parameters calculation process.
Coin selectors AL55xx and AL66xx can recognize 16 different coins(*channels*).
Dialog window for coin programming is shown on image 4.2.10.
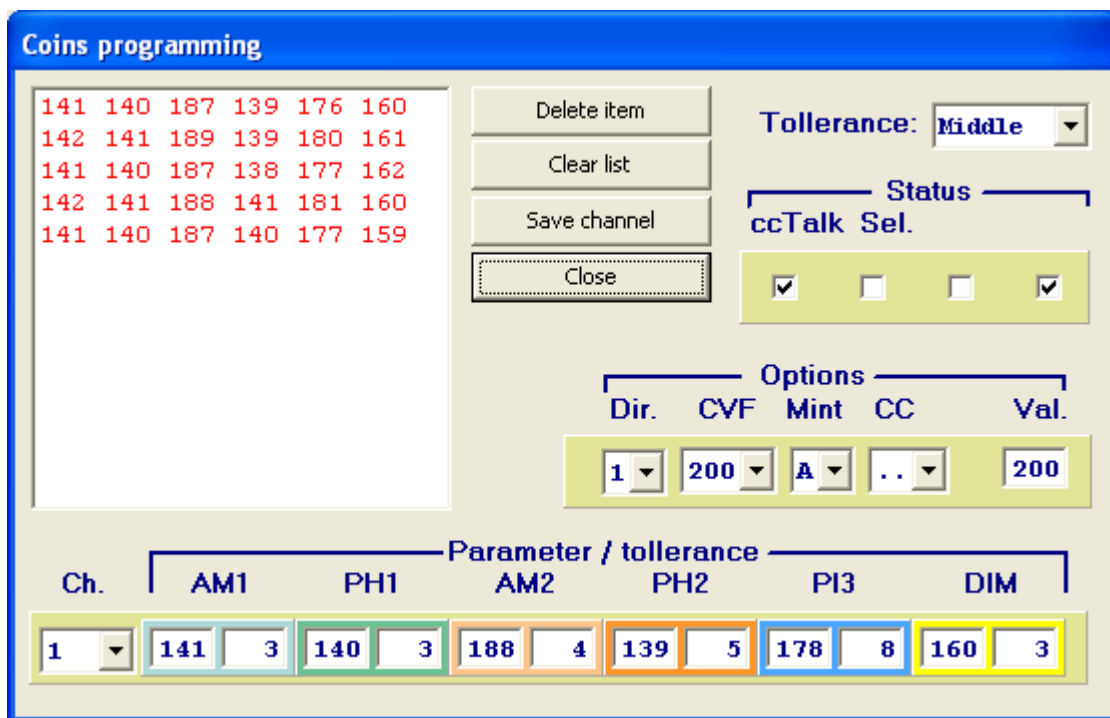
Img. 4.2.10 Coin programming dialog

Coin channel counter will be automatically set to first channel and if channel is already programmed the information window like one on image 4.2.11 will appear.
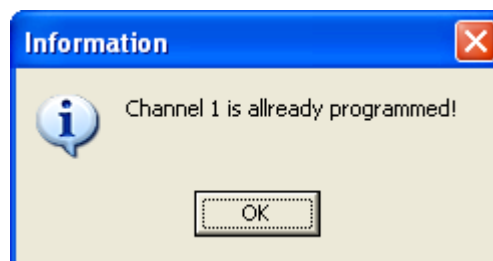
Img. 4.2.11 Channel programed
Press button **[OK]** and dialog will be closed and programming will start.
All data except coin recognition parameters will remain the same!
If channel was not programmed programming will start with default values and user must program(*change*) those values before pressing of the button **[Save channel]**.
Selection of another channel is done from fall-down menu at the left bottom side of

the dialog window(***Ch.***).

In this phase of programming PC program is polling some commands and retrieve data from coin selector each time when coin sample is inserted. To avoid erroneous reading of coin parameters insert coins slowly one by one.

Dialog has one big window at upper left side where all current measured values are displayed in one row. Measured parameters are divided in six columns.

When all rows are full, they are scrolling up so the last measurement is always visible at the bottom of this window. Values are presented as decimal numbers!

Numbers will be red till optimum number of coin samples are tested[37], than they will turn to green. User can chose to end programming even with smaller number of samples or to insert more samples. It depends also on the type of coins that are tested. It is recommended to use more samples for bimetallic coins and coins with more parameters measure spread!

If we notice during the coin insertion one or more parameters to have high deviation this result(*one row*) can be deleted. Click with mouse on that row and press the most upper button **[Delete item]**, this measurement will be erased. To erase all measurement press the button **[Clear list]**.

To save data of this channel pres the button **[Save channel]**.

After that the confirmation window shown on image 2.2.12 will appear.
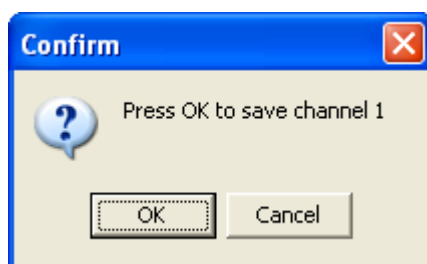
Img. 4.2.12 Confirm programming

Press the button **[OK]** to confirm or **[Cancel]** to quit without change.

In both cases this window will be closed and channel indicator will point to the next channel. New data will be present in page **Channels ...**, but they still would not be saved in coin selector memory!

To write coin channel data in to the coin selector memory close this program by pressing the button **[Close]**. After that the new confirmation window like one on image 4.2.13 will appear.

Press the button **[Yes]** to confirm or **[No]** to exit without saving data.

Press the button **[Cancel]** to remain in **Coins programming** dialog window.

If we exit from programming without saving coin data in to the NV memory, they will remain in the program buffer and it will be possible to save them later using tool bar button **[Download]**.

_____
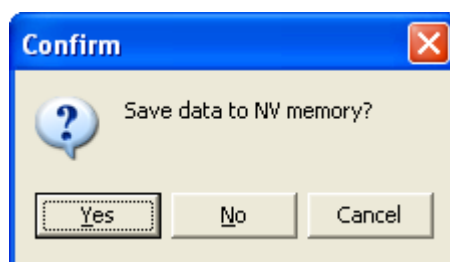
37 Minimum 15 samples

Img. 4.2.13 Confirm coin data save

In case that channel number was changed before saving the data for that channel the confirmation window like one on image 4.2.14 will appear. Confirm change(*Yes*) or go to new selected channel programming without change previous(*No*).
I you chose to press **[Cancel]**, coin channel counter will return to the previous channel number and all previous data will remain as before.
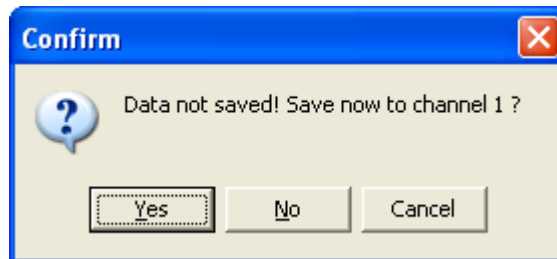
Img. 4.2.14 Confirm coin data save

In the bottom of dialog there is graphic and numeric data presentation block that look like part of one row from **Channels**(*coin data*) tabbed page.
In this block parameter average value and calculated tolerance is displayed.
From fall-down menu on top right corner, it is possible to select 3 different tolerances which represent different selected accuracy(*acceptance ratio*).

Acceptance probability or tolerance is than calculated according to measurement standard deviation and selected accuracy from formula:

$$p = \pm \frac{P\sigma}{\sqrt{n}}$$

Where **P** is selected accuracy, **σ** is standard deviation(*calculated*), **p** is tolerance and **n** is number of measurement.
For higher selected accuracy tolerance will be lower.
Number of measurement is one and tolerance for different selected accuracy is:

- accuracy 99%(*high tol.*)   **P**=2.53   tolerance is **p**=**2.53** x **σ**
- accuracy 95%(*medium tol.*)   **P**=1.96   tolerance is **p**=**1.96** x **σ**
- accuracy 90%(*low tol.*)   **P**=1.30   tolerance is **p**=**1.30** x **σ**

Due to environment variation like temperature and humidity that will effect the measured results during coin selector operation and unpredictable variation of coins physical characteristic(*worn coins or mint variation*) additional tolerance is set for each parameter. Additional value is possible to view in bottom of the dialog after insertion of first coin[38].

It is also necessary to set coin status before programming the coin parameters.
Status flags are set or cleared in **Status** check boxes. Each coin channel has 4 status flags to set up by user and they are explained in chapter 4.1.4.
It is also possible to make this changes in main dialog **Channels** after programing

38 Calculated tolerance after first insertion is zero!

the coin parameter.

Sorting direction, coin description and relative value is done in same way like the one explained in chapter 4.1.4.

4.2.7 FLASH Upgrade

Coin selectors AL55xx and AL66xx are based on FLASH memory micro controller. Future new versions of software improvement or error correction will be available to all users of our coin selectors. **[Up-grade]** button is used to activate this function.
Program memory FLASH up-grade do not change your specific programmed data.
Exception is, if some new data must be set that did not exist before.
After reset this value will be written in to data memory automatically.
However for safety reasons it is recommended to read your coin selector data and save it on PC disc memory before up-grade.
After **[Up-grade]** button activation, a new dialog window like one on image 4.2.15. will appear on screen. This dialog has 3 buttons and time progress bar.
First select the file for up-grade with button **[Open file]**. System dialog **Open** like one on image 4.2.1 will appear on screen. Only files that has extension **.u19**(*"up-grade"*) will be displayed for selection. This type of files are encrypted from Motorola S-record with extension ".s19". Coin selector monitor program will accept and decrypt that file, erase and reprogram FLASH program memory during that process. Each up-grade file has internal identification code that must match with coin selector. All other files will be refused and process will not start.
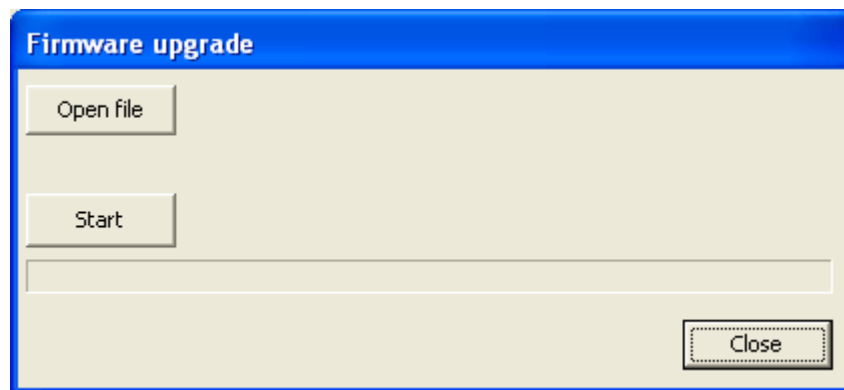
Img. 4.2.15.a Program memory(FLASH) upgrade

Press button **[Open]** and file name and path will be displayed in the dialog.
Press the button **[Start]** to initiate upgrade. Time progress bar will start to move toward the end.
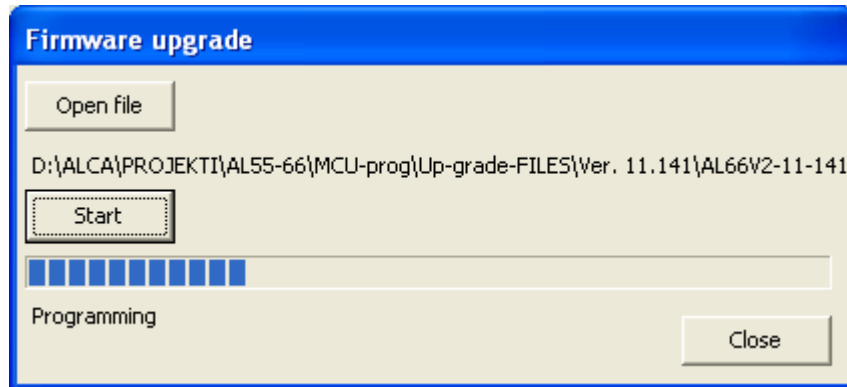
Img. 4.2.15.b Upgrade in progress

For coin selectors with LED indicators they will be turned off.

Programming software will check the coin selector check code and compare it with file check code. In case of code mismatch an error message like one on image 4.2.16 will appear.


Img. 4.2.16 File type mismatch

If up-grade process was not finished because of power failure or communication problems the error message like one on image 4.2.17 will appear and coin selector will remain in "Monitor" mode. Up-grade procedure must be repeated all over again.
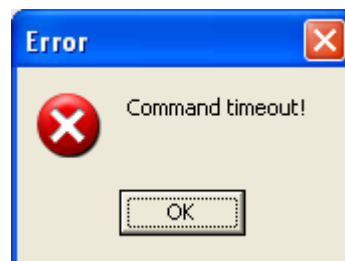
Img. 4.2.17 Communication time out

Turn power off/on, press the button **[Search]** and program will recognize coin selector even if it is still in the monitor mode. The new dialog window like one on image 4.2.18 will appear. Confirm and repeat whole procedure to finish upgrade.
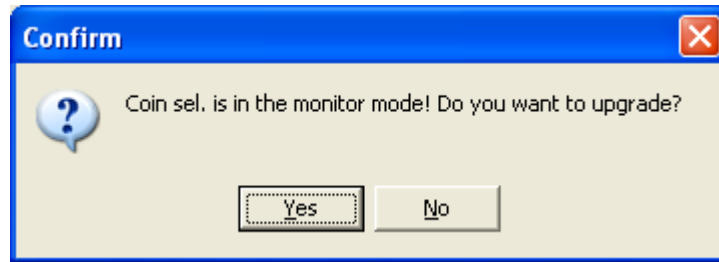
Img. 4.2.18 Coin selector in monitor mode

At the end of process total time will be displayed and info dialog same as one on image 4.1.5.a(*chapter 4.1.3*) will appear. Coin selector will be reseted and LED indicators will turn on again(*Green*). Close that dialog by pressing the button **[Ok]**. Upgrade process will last approx. 10 seconds but in noisy environment[39] it can last longer.

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39 Upgrade use higher boud rate(38400) and 16 bit CRC CCITT check.

4.2.8 Test(*User*)

To make use of our coin selector simple as possible user can perform a test of coin
selector. Test function is activated with button **[Test]**. The dialog window for test is
shown on image 4.2.19.a. This dialog has a several groups of coin selector data and
output control buttons
At the bottom there are two buttons and one check box for acceptance test.
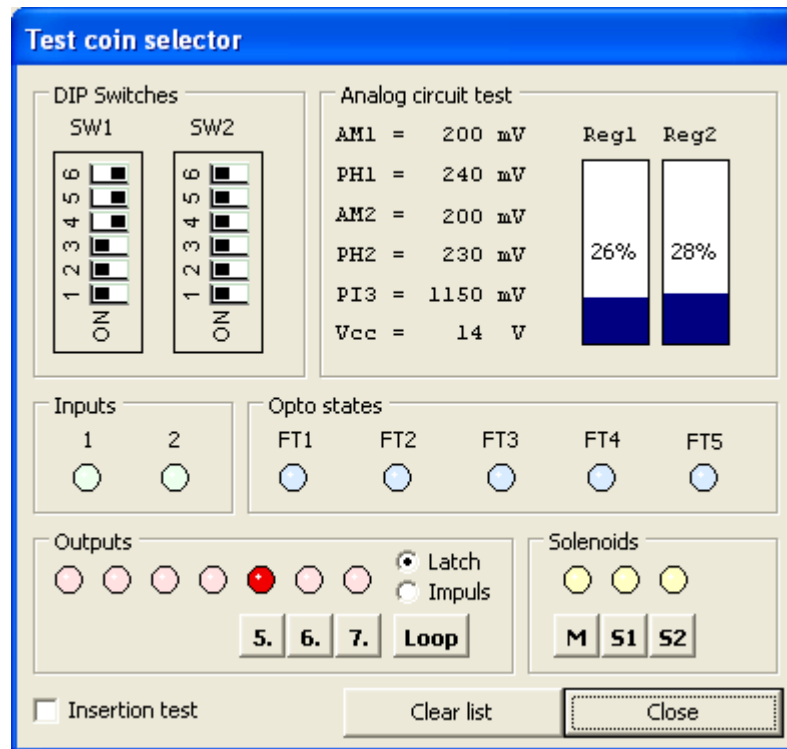
Img. 4.2.19.a Test coin selector

4.2.8.1 Coin selector data

Data presented in this dialog are updated every 0,5 seconds, except when coin
acceptance test is active!
Opto sensors state is an exception. Change of state will be latched after first
detection of error. Data presentation groups are:

- DIP-Switches
- Analog circuit test
- Inputs
- Opto states

DIP-switches
State of DIP-sw mounted on the PCB are shown in top left part of dialog in group:
DIP-switches. It is graphic presentation of switches with position and orientation
similar to one on PCB. If coin selector has one DIP-sw(*AL55xx*) than only **SW1** will be
presented. Coin selectors of series AL66xx has both switches SW1 and SW2.

Analogue values
This group of data has numeric presentation of MCU analog input values when coin

selector is in "idle"[40] state and graphic presentation of magnetic sensor regulation. This values are mainly indication of coin measurement analogue signal circuit and sensor state. Analogue values are.

- AM1
- PH1
- AM2
- PH2
- PI3
- Vcc
- Temp(*if there is one*)

AM1 idle level on analog input 1, is amplitude signal from first magnetic sensor pair(*first lower*). Usual value is 200 mV with very small variation[41].

PH1 idle level on analog input 2 is phase signal from first magnetic sensor pair(*first lower*). Usual value is from 100 mV to 350 mV.

AM2 idle level on analog input 3 is amplitude signal from second magnetic sensor pair(*higher*). Usual value is 200 mV with very small variation.

PH2 idle level on analog input 4 is phase signal from second magnetic sensor pair(*higher*). Usual value is from 0 mV do 450 mV.

PI3 test level on analog input 5 is pulse induction envelope signal on third magnetic sensor pair(*last lower*). Usual value is from 950 mV to 1200 mV.

Vcc is power supply voltage level of coin selector in V(*Volts*).

Temp value in °C, appear only if special type of coin selectors with temperature sensor built in(*future product*) is tested.

First two sensor pairs has PWM regulation of magnetic field strength.
The regulator position or duty is presented(*as percentage*) as level bar.
First magnetic sensor regulator value is shown under the mark **Reg.1**, and second under the mark **Reg.2**.

Inputs
According to the configuration(*Input/output settings*) coin selectors has one or two inputs. Group of data **Input** show the state of this inputs. Active input will light on the signal lamp with corresponding number.
Input 1 is connected with 10 pole IDC connector **pin 6** and usually used for coin acceptance inhibit. Active level is high voltage level from 5 to 30 Volts. If programmed polarity is reversed than active level will with pin not connected or low level less than 1 V(*GND*).
Input 2 is connected to **pin 5** and used only in few coin selector configurations. Indicator lamps will be turned off if corresponding input is not programmed or activated!

Opto states
Data group **Opto states** show as the state of optical pair of sensors. All coin selectors has two pair of optical sensors for diameter measurement placed on entrance top part of coin selector(*between magnetic sensors*). Each pair consists of

---

40 No coin acceptance
41 In some cases coin selectors could have different values than indicated in this document!

IR LED(*on moving part*) and photo transistor(*PCB bottom side*). Light is passing through tiny holes that are necessary to clean from time to time[42].
According to coin selectors type they also have 1 to 3 control optical sensor pairs. Control optical sensors are used to detect coin position during the acceptance or even rejection process. Coin selector software use this information to recognize different attempt of fraud or mechanical jam of coins, activation of sorters, rejection of close coin etc. Control sensor also consists of IR LED and photo transistor pair.
They are mounted on PCB top side(*SMD*), with light passing through holes in main bottom part of housing and optical prism mounted on part of housing that hold acceptance gate coil and mechanism. It is also necessary to clean this part from time to time. Optical sensors are marked same as photo transistor on PCB(*FT1 to FT5*)!
All optical sensor LED's are driven in dynamic(*pulsed*) way and some time it is difficult to detect optic errors if they do not last longer. This is case when sensors are dirty. At first detection of closed optical sensor, the corresponding light indicator will be turned on and stay turned till end of test!

4.2.8.2 Output and coil test

Output is possible to test only if they are programmed(*used*), this apply also to the sorter coil(*output*) test.
Two sets of buttons are used to test output and coil activation:

- Output
- Coils

Output
There are 7 possible outputs on coin selectors. Outputs can be activated and tested[43] pressing the corresponding button marked with numbers 1-7. Marking is the same as in Technical manual of coin selector . Output is possible to activate with single 100 ms pulse or permanent(*latched*). Selection of activation mode is done with radio button **Latch** or **Pulse**. For internal indication of output activation there is a lamp indicator above each button. This lamps are not indicating physical output activation! For that purpose use ALBERICI testing kit.

Coils
In this group of output there is 1 or up to 4 buttons for testing the coil activation.
To avoid coil overheating only pulsed(*100 ms*) activation is allowed.
All coin acceptors has acceptance gate coil which is tested with button **[M]**.
Some time if coin selector is configured for sorter activation there is 1 to 3 sorter outputs that could be tested with buttons: **[S1]** for coil on output 6(*pin 4*), **[S2]** output 5(*pin 3*) and **[S3]** output 4(*pin 10*). Outputs that are not programed for sorter coil is not possible to test. If sorter is connected with coin selector coil will be turned on for short period and than turned off(*one click*) but if sorter is not attached output is possible to test in same way as regular output!

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42 See Technical manual chapter about maintenance
43 To test output indicator lamp(bulb or LED) must be connected between power supply + and out pin!

4.2.8.2 Acceptance test

Some of the coin selectors must be enabled and have serial polling of ccTalk command **229, Read buffered credit and error codes** to accept coins.
This operation is usually done by host machine. If we select in check box **Insertion test** all other test will be suspended. In terminal window only coin position and error messages will be displayed after each coin insertion. Message string will scroll to point always on the last event. Dialog window is shown on image 4.2.19.b.
If coin has been accepted message string with coin position number will appear on terminal window. In example, if accepted coin has position 1 message will be: **Coin 1**. For unrecognized or generally for coin that are not accepted message will be: **Rejected**. To erase terminal window messages use button **[Clear list]**.
To end coin acceptance test and continue with other tests deselect check box.
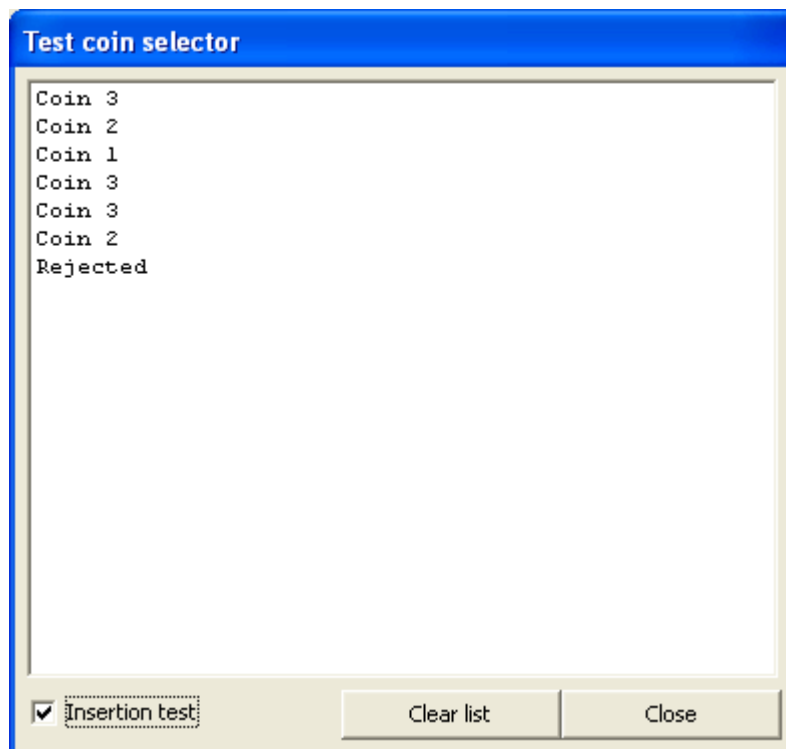
Img. 4.2.19.b Coin acceptance test

To close the dialog **Test** and finish the test press the button **[Close]**.
This will reset all test options: latched outputs, optical sensors state and coin acceptance.

4.2.10 Search

This function is activated with button **[Search]**. It is the same function that is activated at program start up. Use this function every time when coin selector has been changed to refresh(*update*) coin selector basic information data.
All details of this function are explained in chapter 3.2.

4.2.11 Exit

The button **[Exit]** will close the main dialog window(*close application*).
Before closing confirmation dialog like one on image 4.2.20 will appear.
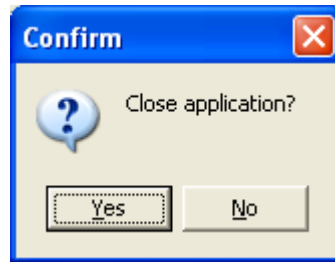
Img. 4.2.20 Exit confirmation

Press the button **[Yes]**, to confirm closing and all coin selector basic information and
PIN will be cleared. Press the button **[No]**, to return in to the main program.