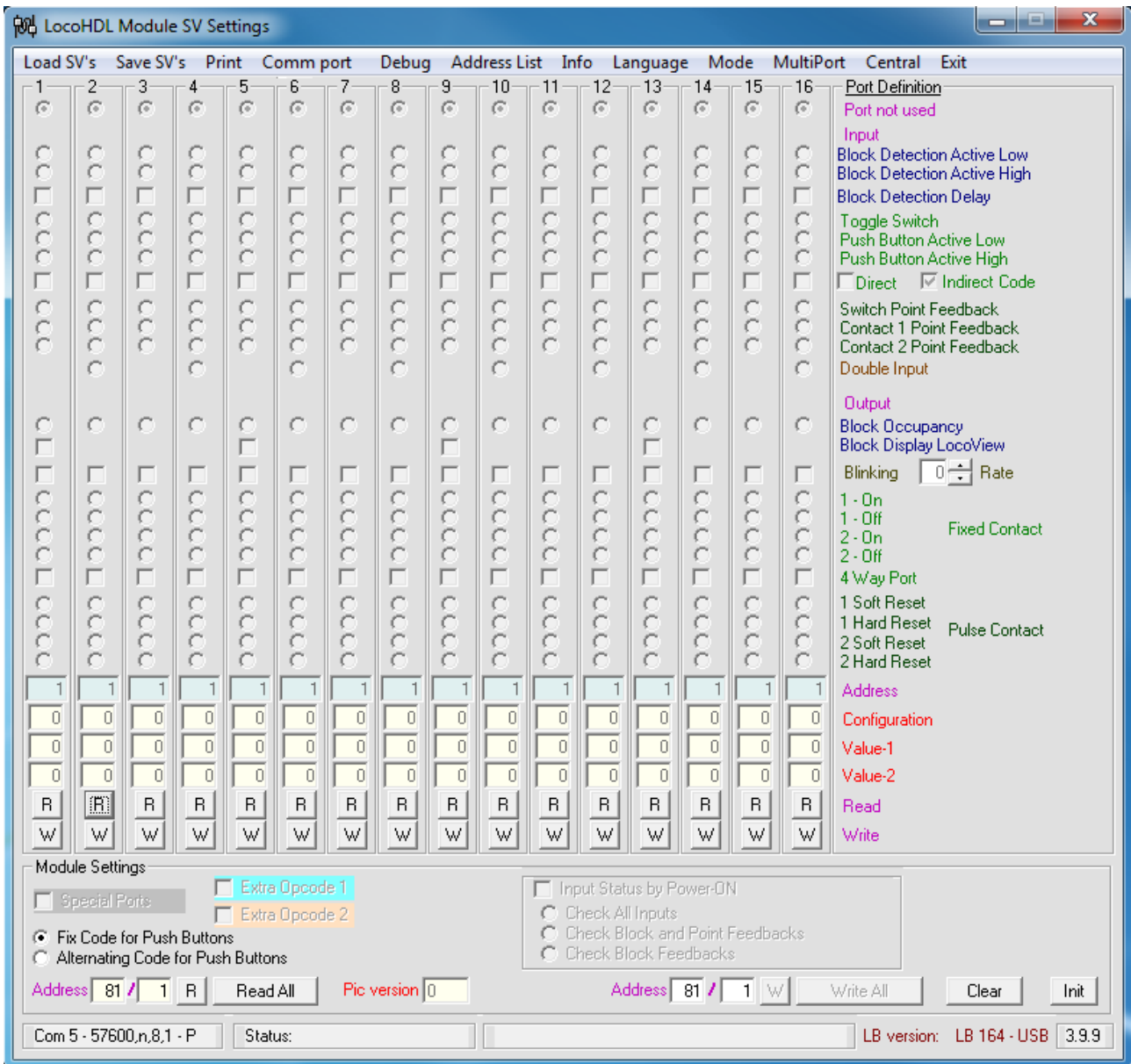


LocoHDL Module Configuration



Liability disclaimer:

Use all items that can be bought and installation instructions that can be found on this site at your own risk. They have been developed for personal use, and I find them very useful. That is why I wish to share them with other model railroad hobbyists. All items and procedures have been tested and used on my own model railroad systems without causing any damage, but this does not necessarily imply that all modifications and procedures will work in any and all environments or systems. I cannot take any responsibility when items or procedures are used under different circumstances. Always use your own judgement and common sense!

LocoHDL configuration program

This program serves to configure in a simple manner all LocoHDL modules, such as LocoIO, LocoServo and LocoBooster. The configuration program communicates with the different modules through a serial or USB port on the PC with a LocoBuffer over Loconet.

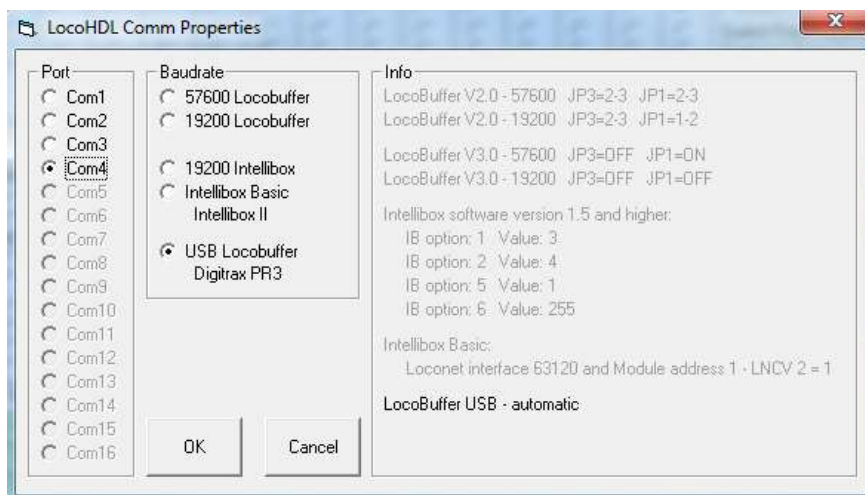
Setup configuration program:

The first time you start LocoHDL configuration program it asks to setup your com port settings.

Comm port

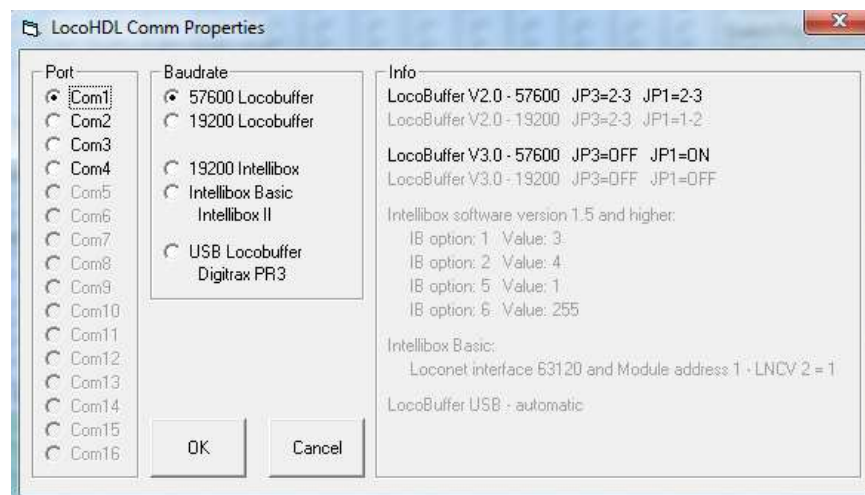
With this button on the toolbar you can always change the settings.

1) For LocoBuffer with USB or Digitrax PR3: Select "USB LocoBuffer" and the Com port.



2) For LocoBuffer with RS232: LocoBuffer has to be set in LocoBuffer mode JP3: 2-3

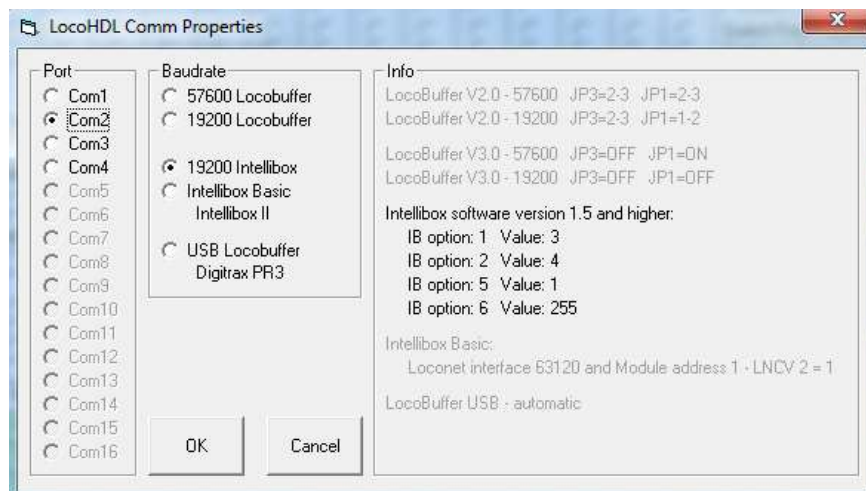
The baud rate on the LocoBuffer can be set with JP1. (Some older PC and Portables have problems with fast communication and then you can use 19200). Select the settings that you have set with the Jumpers and push OK.



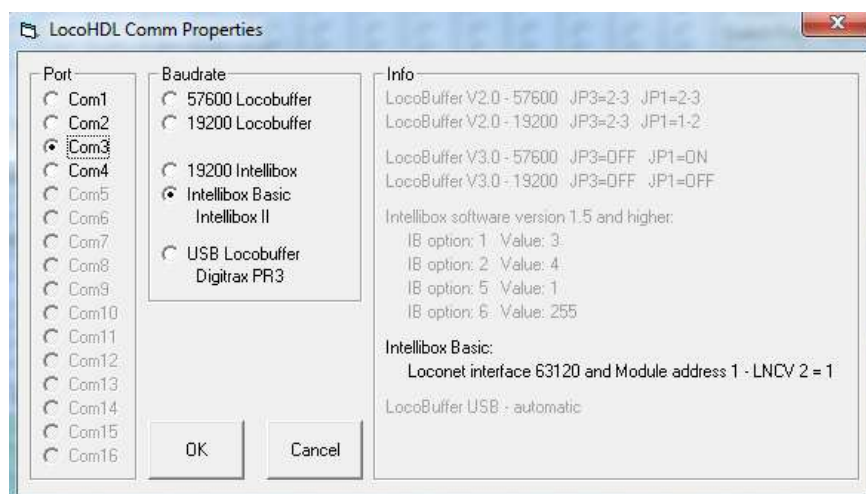
3) For Intellibox: LocoHDL configuration program also works on the Intellibox software version 1.5 and higher with

IB option: 1 Value: 3 interface speed 19200 bps
 IB option: 2 Value: 4 interface syntax Loconet
 IB option: 5 Value: 1 number of stop bits 1
 IB option: 6 Value: 255 disable drop of CTS when entering 'stop' state

There are a few limits as no address list window.




4) For Intellibox Basic or Intellibox II:

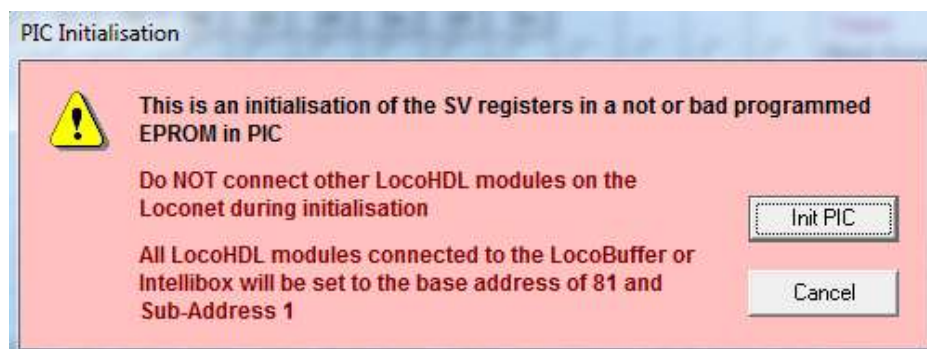


Initialisation of a LocoHDL module:

This is an initialisation of the SV registers in a bad programmed EEPROM in PIC where the address of the PIC will be unreadable. Bad data in the basis SV registers can be also corrected.

Step1: DO NOT connect any other LocoIO device on the Loconet connections. The reason for this is: LocoIO broadcast message are sent by the initialization. It can destroy settings of other LocoIO modules.

Step2: Start the LocoHDL configuration program and  Push the 'Init' button



Configuration program



Toolbar Buttons:

Load SV's **Save SV's**

The SV information can be Saved and Loaded on your computer for each LocoIO.

Exit

Program exit button

Language

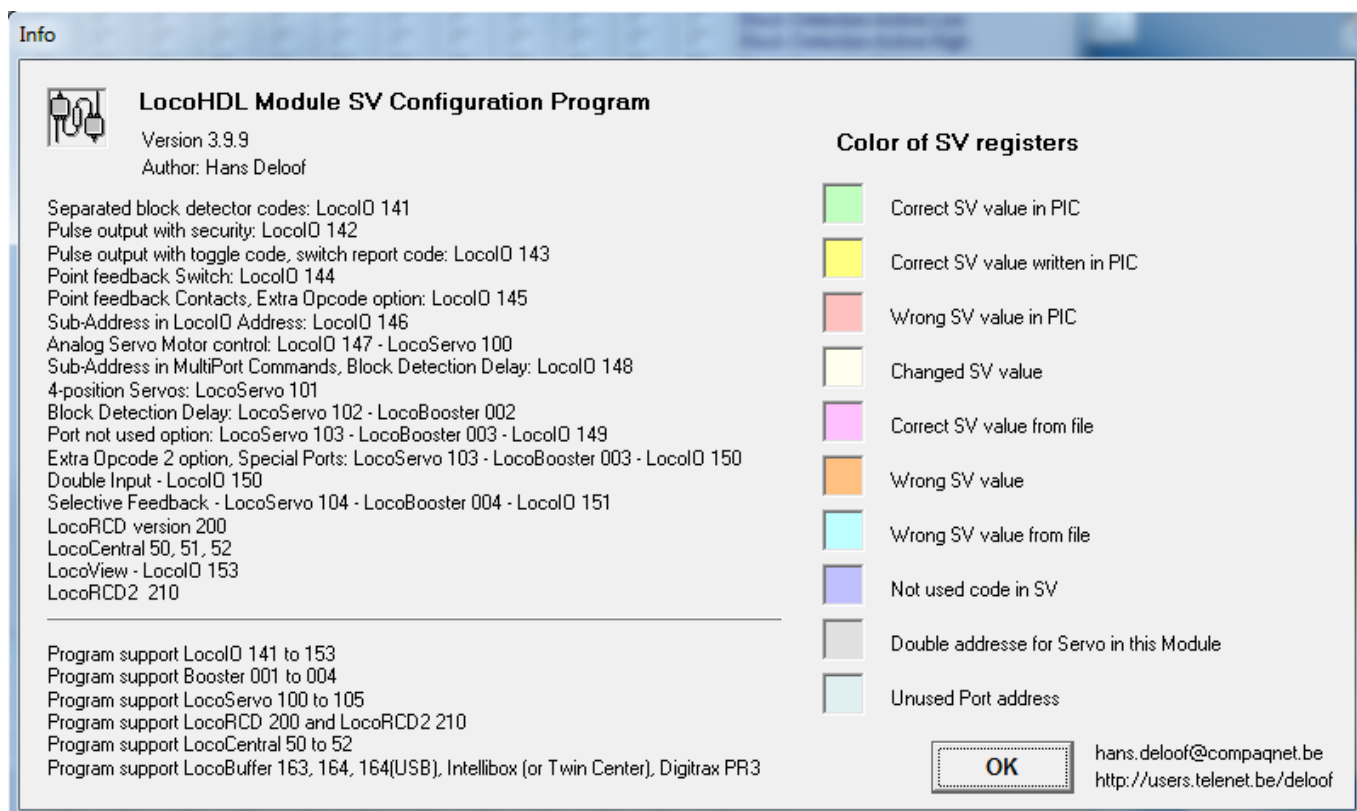
Different languages can be selected

Print

It is possible to print the data of the LocoHDL Modules.

Info

Information about LocoIO Configuration program version



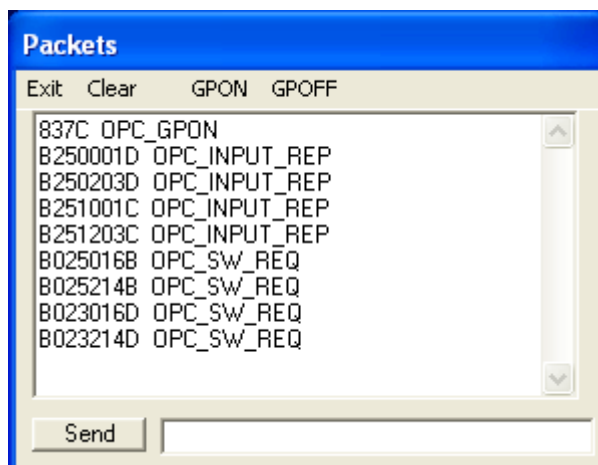
Debug

This button gives a second window that displays the Loconet packets on your Loconet line.

Send

If you have experience with Loconet commandos then you can send a packet to Loconet with or without the checksum.

(This window is not available with Intellibox interface.)



Address List

Exit Read Clear

001/001	ver: 148 - LocoIO
002/001	ver: 148 - LocoIO
003/001	ver: 148 - LocoIO
004/001	ver: 148 - LocoIO
005/001	ver: 148 - LocoIO
006/001	ver: 148 - LocoIO
007/001	ver: 148 - LocoIO
008/001	ver: 148 - LocoIO
009/001	ver: 148 - LocoIO
010/001	ver: 148 - LocoIO
011/001	ver: 148 - LocoIO
012/001	ver: 148 - LocoIO
013/001	ver: 148 - LocoIO
014/001	ver: 148 - LocoIO
015/001	ver: 148 - LocoIO
016/001	ver: 102 - LocoServo
017/001	ver: 102 - LocoServo
018/001	ver: 148 - LocoIO
019/001	ver: 148 - LocoIO
020/001	ver: 148 - LocoIO
021/001	ver: 148 - LocoIO
022/001	ver: 148 - LocoIO
023/001	ver: 148 - LocoIO
024/001	ver: 148 - LocoIO
025/001	ver: 148 - LocoIO
026/001	ver: 102 - LocoServo
027/001	ver: 148 - LocoIO
028/001	ver: 148 - LocoIO
029/001	ver: 148 - LocoIO
030/001	ver: 148 - LocoIO
031/001	ver: 148 - LocoIO
032/001	ver: 148 - LocoIO
033/001	ver: 148 - LocoIO
034/001	ver: 102 - LocoServo
035/001	ver: 148 - LocoIO
081/001	ver: 150 - LocoIO
082/000	ver: 144 - LocoIO

Address List

The button gives a second window that show a list of all LocoIO addresses used on the connected Loconet line.

If you click twice with the mouse on an address then are all the registers of this module will be reading.

If you hold the CTRL bottom and then click the mouse on an address then are only the module registers reading.

This window is not available with Intellibox interface.

Mode

There are two modes "Simple" and "Expert"

"Simple" gives Port status with a simple color code.

"Expert" gives the status of a port with a color code and the values of the SV's.

Central

Open window for the operation of LocoCentral.
See Manual of LocoCentral.

LocoHDL Module adjusting:

Assigning each module a unique configures address over Loconet.

The LocoHDL configuration programme can communicate afterwards always with the modules, even during the service of a model layout.

LocoHDL modules contain also Sub-addresses outside the ordinary address:

- One can give a fixed address to areas in a layout and using Sub-addresses within an area.
- In a module Layout you can grant an address to the club members and then every club member can use several LocoHDL modules with several Sub-addresses.

Address (SV1) = 1 ... 79 or 81 ... 127 (80 is reserved for Locobuffer), Default = 81 after initialization.

Subaddress (SV2) = 1 ... 126, Default = 1 after initialization.

In total you can then talk to 15876 independent modules.

SV1 is the address and SV2 is the Subaddress of the LocoHDL

module where you are with in communication.

You can set a new address value of the LocoHDL module and write it in the LocoHDL by press the "W" button. This new address is set to the LocoHDL module indicated in SV1 and Sub-Address in SV2. If you press "Write All" then you write the new address value and ALL other SV's in the LocoHDL module.

If you want to communicate with another LocoIO module the you can put in another address value in the SV1 and/or Sub-Address in SV2 textbox.

And push the "R" button.

If you have communication with the LocoIO module than all textboxes are green (if the values are correct) and gives the values of the registers SV0, SV1, SV2 and the PIC version program.

If you push "Read All" you read all SV registers of the LocoHDL module. Then SV information is automatic translated to port address and function.

It clears all the SV and settings to make your window ready for a new configuration.

For push buttons you can make a choice of two methods

This setting is for ALL push buttons on the LocoHDL module together.

"Fix Code" means a push button can switch an output on or off. In other words, you will need 2 push buttons to switch an output.

"Alternated Code" means that each time the button is pressed, it will alternate between switching an output on or off.

! The "fixed code" is advised, because in this case you will always be sure what will happen.

All older versions use JP1 hardware Jumper to set on and off the Input status at Power ON (check all inputs).

JP1 Off Input status on Power-ON, after a Loconet disconnection and on a GPON.
 On Only input status on a GPON

Input Status by Power-ON
 use JP1 for this Module

Remarks:

- User of a Digitrax Command Station DB150 and Intellibox and PC users need to set JP1 On.

From LocoIO 151, LocoServo 104 and LocoBooster 004 is it with the software adjustable with more options.

Only input status on a GPON

Input Status by Power-ON
 Check All Inputs
 Check Block and Point Feedbacks
 Check Block Feedbacks

(Idem as JP1 On)
 All Inputs give their status

Input Status by Power-ON
 Check All Inputs
 Check Block and Point Feedbacks
 Check Block Feedbacks

Blocks and Points Feedback give their status

Ingang Status bij Power-ON
 Check Alle Ingangen
 Check Blok en Wissel Terugmeldingen
 Check Blok Terugmeldingen

Only Blocks give their status

Input status on Power-ON, after a Loconet disconnection and on a GPON.

Input Status by Power-ON
 Check All Inputs
 Check Block and Point Feedbacks
 Check Block Feedbacks

(Idem as JP1 Off)
 All Inputs give their status

Input Status by Power-ON
 Check All Inputs
 Check Block and Point Feedbacks
 Check Block Feedbacks

Blocks and Points Feedback give their status

Input Status by Power-ON
 Check All Inputs
 Check Block and Point Feedbacks
 Check Block Feedbacks

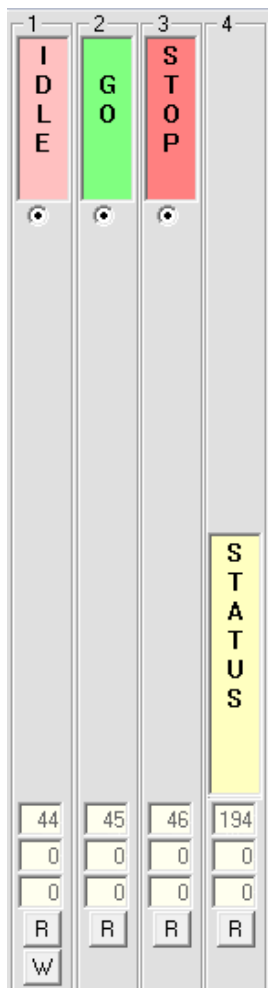
Only Blocks give their status

Remarks:

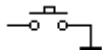
- User of a Digitrax Command Station DB150 and Intellibox and PC users need to uncheck Input status on Power-ON.

Special Ports

The "Special Port" option gives on the First 4 ports (on J4) of a LocoIO, LocoServo or LocoBuffer module the possibility to setup a special function.



Port 1, 2 and 3 are inputs that can be provide with a push button.

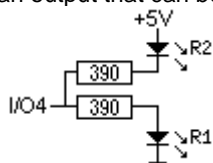


At pressing of the push button of port 1 will be send an "IDLE" commando to Loconet.

At pressing of the push button of port 2 will be send a "GO" commando to Loconet. A "GO" commando says on the Loconet network that the train layout is ready to operate.

At pressing of the push button of port 3 will be send a "STOP" commando to Loconet. The Central will switched off the Power of the Boosters. You can see this command as an emergency stop of the layout.

Port 4 is an output that can be provided of a circuit with a red LED R2 and a green LED R1.



The green LED gives the indication that a "GO" command is received from Loconet. The red LED gives the indication that a "STOP" or "IDLE" command is received.

Info:

The "GO" and "STOP" have the same function as the buttons with the same name on a Intellibox Central.

Port Settings:

Assigning the different ports a function.

On the LocoIO are 16 ports, on the LocoServo are 4 or 8 ports and on the LocoBooster are 4 ports that universal and independently of each other as input or output can be switched.

An extended description of the input and output can you find in the LocoIO manuel under chapter "LocoIO possibilities"

! RECOMMENDATION:

- If the used version of LocoIO has not the option selection "Port not used", then it is been advised to define unused ports as output ports, and give them an unused address. Then you prevent that interference on the module will send out undesirable codes on Loconet.
- Always give ports that are used as Servo output an address that occurs only once on a module.

- Not used
- Entrée
- Détection Bloc active faible
- Détection Bloc active élevé
- Block Detector Delay
- Inverseur
- Poussoir active faible
- Poussoir active élevé
- Direct Indirect Code
- Rétraction disjoncteur d'aiguillage
- Rétraction contact 1 l'aiguillage
- Rétraction contact 2 l'aiguillage
- Double entrée
- Sortie
- Occupation Bloc
- Bloc Display
- Clignote fréquence
- 1 - On
- 1 - Off
- 2 - On
- 2 - Off
- 4 Way Port
- 1 Soft Reset
- 1 Hard Reset
- 2 Soft Reset
- 2 Hard Reset

Configuration buttons:

Blinking Rate
 The blinking rate can be changed between 0 and 15
 When changing this setting, ALL blinking functions on this LocoHDL module will be changed.

Adresse
 This is the address of the signal, the point, block detector, ...
 This is the address of the respective port that is used in the train job control software.
 According to the Loconet specifications can signals and points have an address of 1 up to 2048.
 Block-system detection or push buttons has an address range of 1 to 4096.

Adresse
 Contact Indicator: A= 7 - I= 4
 Tooltip text gives it in accordance with address and input as at S88.
 Example: Loconet address 100 = S88 address 7 and input 4

Adresse
 Green/Straight: A= 50
 Adresse
 Red/Round: A= 50
 Tooltip text of a push button gives the address of signal and point which it will switch with its situation.

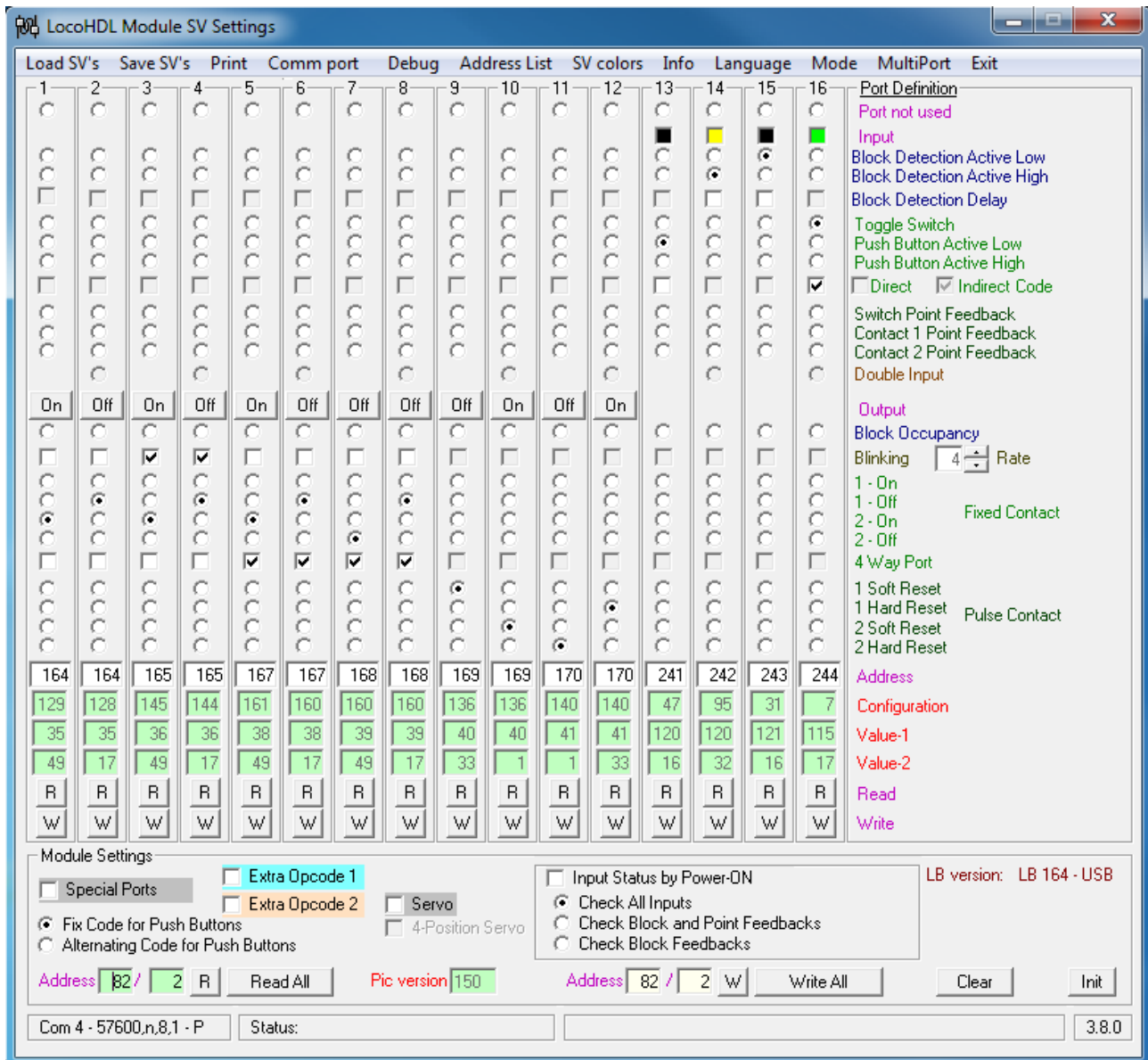
Adresse
 Push Button-> 199
 Tooltip text of fixed or puls contact indicates with which push button you can switch these.
 Example: Loconet address 100 contact 1 = push button 199

Configuration
 Value-1
 Value-2
 Read
 Write
 For each port of the LocoIO module with address indicated in SV1/SV2, you can read and write (using the buttons) the Configuration, Value1, Value2 register.

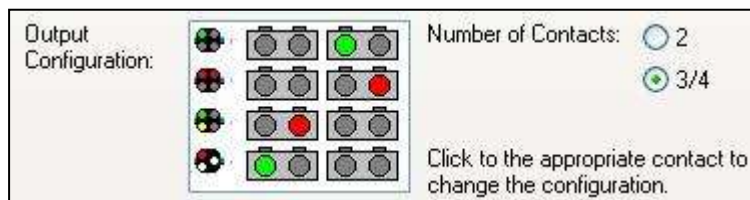
When the SV registers of an Output are read correctly, a test button will appear. With this test button, you can change the output to test its functioning.

The screenshot shows a control interface for an output. At the top, there are 'On' and 'Off' radio buttons. Below them is a 'Blinking Rate' control with a value of 0. The interface lists several contact types: '1 - On', '1 - Off', '2 - On', '2 - Off' (labeled as 'Fixed Contact'); '4 Way Port'; and '1 Soft Reset', '1 Hard Reset', '2 Soft Reset', '2 Hard Reset' (labeled as 'Pulse Contact'). At the bottom, there are address fields for 243 and 244, and a table of registers: Configuration (128, 129), Value-1 (114, 115), Value-2 (49, 17), Read (R), and Write (W) buttons.

LocoHDL configuration program example for LocoIO:



IO 1 and 2 is a red/green signal (1=red, 2= green) with address 164
 IO 3 and 4 is a blinking red/green signal with address 165
 IO 5,6,7 and 8 is a 4-ways signal with address 167 (168)



Railroad & Co TrainController settings.

IO 9 and 10 is a point with coils with only software pulse length
 IO 11 and 12 is a point with coils with software and/or hardware pulse length
 IO 13 is a push button active low that sends OPC_SW_REQ (0xB0) codes
 IO 14 is block detection active high
 IO 15 is block detection active low
 IO 16 is a toggle switch that sends OPC_SW_REP (0xB1) codes

LocoIO, LocoServo and LocoBooster extra opcode option for inputs

An Opcode is a Loconet Command send over the Loconet Network

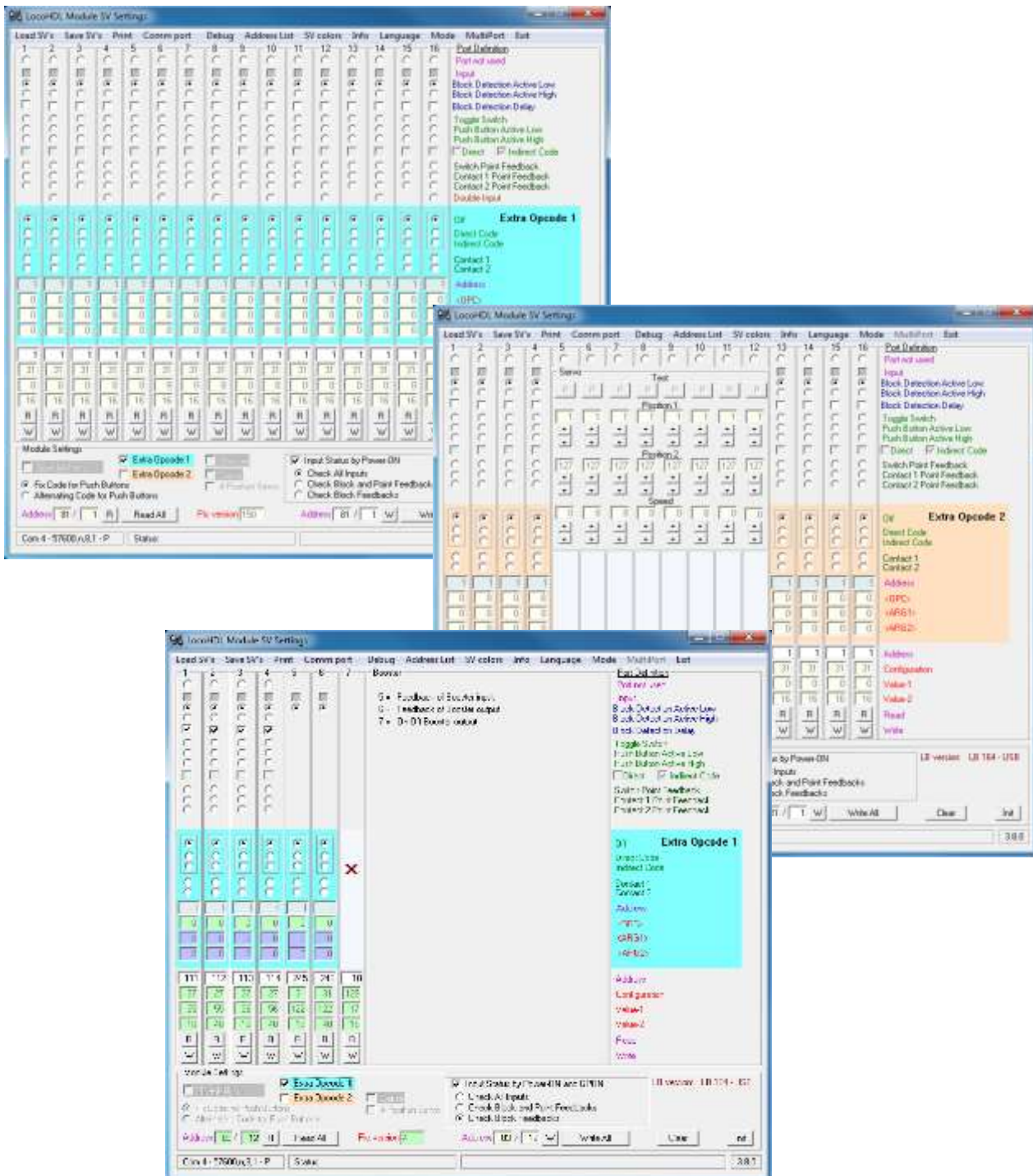
- Extra Opcode 1
- Extra Opcode 2

With this button you can see an optional screen overlay that show the settings for SV51 to SV98. Enclosed there will be send an additional Direct or Indirect Command to Loconet. The Extra Opcode 1 will send at the moment the push button is pushed.

- Extra Opcode 1
- Extra Opcode 2

With this button you can see an optional screen overlay that show the settings for SV128 to SV175. The Extra Opcode 2 has the same functionality as the Extra Opcode 1 but is send when the push button is released.

The Extra opcodes gives the possibility on 1 push button to give 1, 2 or 3 Loconet commandos. Example: with pushing the push button can a point been switched, the Extra Opcode 1 can then switch a second point and at releasing the push button the Extra opcode 2 can set a green signal.



Input without extra opcode

Off
 Direct Code
 Indirect Code
 Contact 1
 Contact 2
 Address
 <OPC>
 <ARG1>
 <ARG2>

Input without extra opcode

Input with extra 0xB0 opcode
(example: signal contact green with address 23)

Off
 Direct Code
 Indirect Code
 Contact 1
 Contact 2
 Address
 <OPC>
 <ARG1>
 <ARG2>

Input with extra 0xB0 opcode
(example: signal contact green with address 23)

Input with extra 0xB1 opcode
(example: point contact2 with address 68)

Off
 Direct Code
 Indirect Code
 Contact 1
 Contact 2
 Address
 <OPC>
 <ARG1>
 <ARG2>

Input with extra 0xB1 opcode
(example: point contact2 with address 68)

Output has no Extra Opcode option

Off
 Direct Code
 Indirect Code
 Contact 1
 Contact 2
 Address
 <OPC>
 <ARG1>
 <ARG2>

Output has no Extra Opcode option

The Extra Opcode 2 is reflected with another colour.

Off
 Direct Code
 Indirect Code
 Contact 1
 Contact 2
 Address
 <OPC>
 <ARG1>
 <ARG2>

The Extra Opcode 2 is reflected with another colour.

Double Input:

At "Double Input" an even input is coupled to an odd input (2 to 1, 4 to 3, ..., 16 to 15).

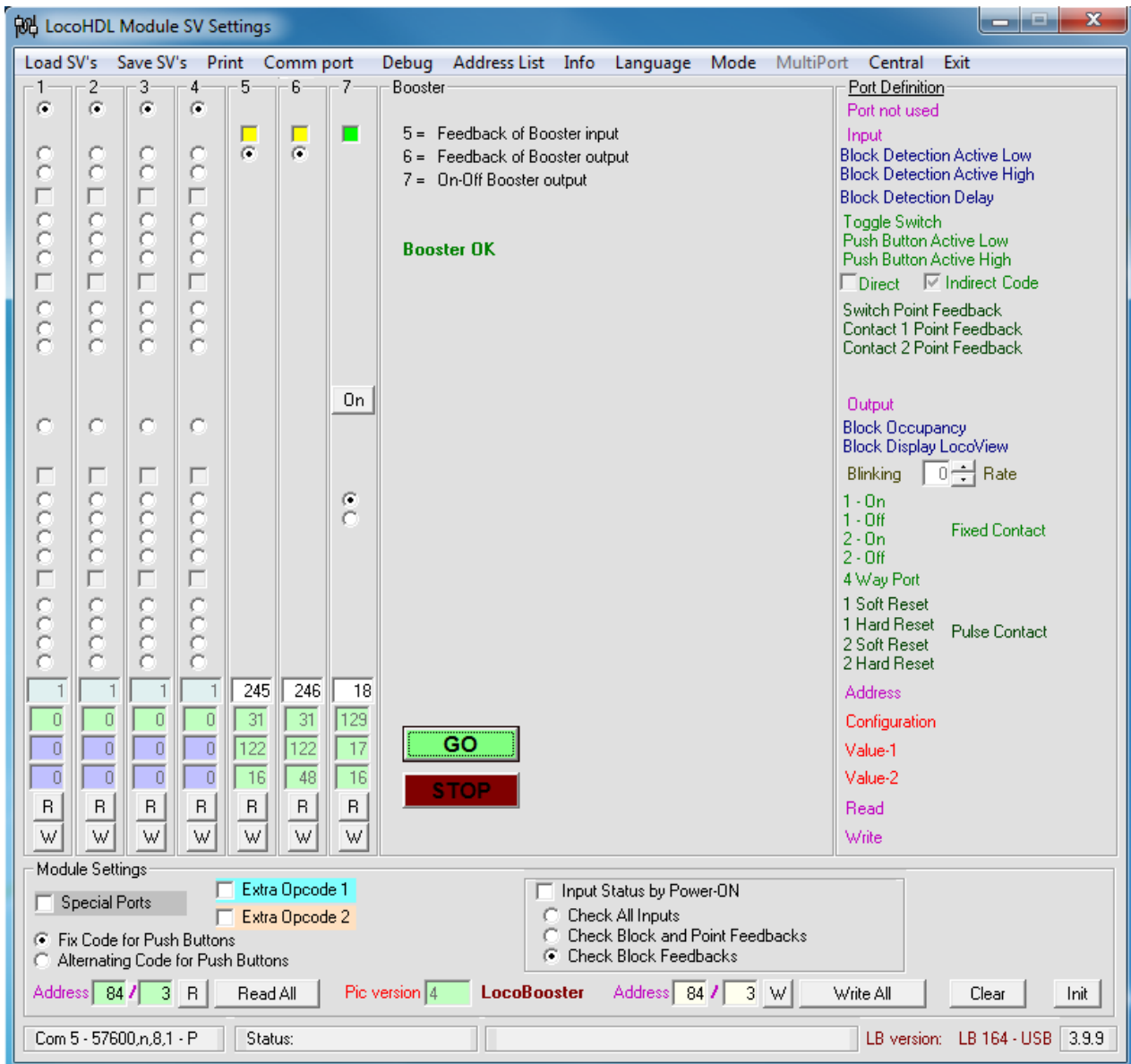
15	16	Port Definition
<input type="radio"/>	<input type="radio"/>	Port not used
<input type="checkbox"/>	<input type="radio"/>	Input
<input type="radio"/>	<input type="radio"/>	Block Detection Active Low
<input type="radio"/>	<input type="radio"/>	Block Detection Active High
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Block Detection Delay
<input type="radio"/>	<input type="radio"/>	Toggle Switch
<input type="radio"/>	<input type="radio"/>	Push Button Active Low
<input type="radio"/>	<input type="radio"/>	Push Button Active High
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Direct <input checked="" type="checkbox"/> Indirect Code
<input type="radio"/>	<input type="radio"/>	Switch Point Feedback
<input type="radio"/>	<input type="radio"/>	Contact 1 Point Feedback
<input type="radio"/>	<input type="radio"/>	Contact 2 Point Feedback
<input type="radio"/>	<input checked="" type="radio"/>	Double Input

Example with port 15 and 16, as on the picture:

- If port 16 stays low (0V), then at active coming of port 15 a Block detection code active with address of port 15 will be send on Loconet and the Extra Opcode 1 of port 15.
- If port 16 stays low (0V), then at Inactive coming of port 15 a Block detection code Inactive with address of port 15 will be send on Loconet and the Extra Opcode 2 of port 15.
- If port 16 stays high (5V), then at active coming of port 15 a Block detection code active with address of port 15 will be send on Loconet and the Extra Opcode 1 of port 16.
- If port 16 stays high (5V), then at Inactive coming of port 15 a Block detection code Inactive with address of port 15 will be send on Loconet and the Extra Opcode 2 of port 16.

LocoHDL Module configuration for L-Booster and N-Booster

In connection with a LocoBooster you can see an optional screen overlay that shows the settings for the Booster.



In terms of functionality the first 4 ports are identical to a LocoIO.

Port 5 has been permanently set to give a feedback message indicating that the input signal of the Booster is present.

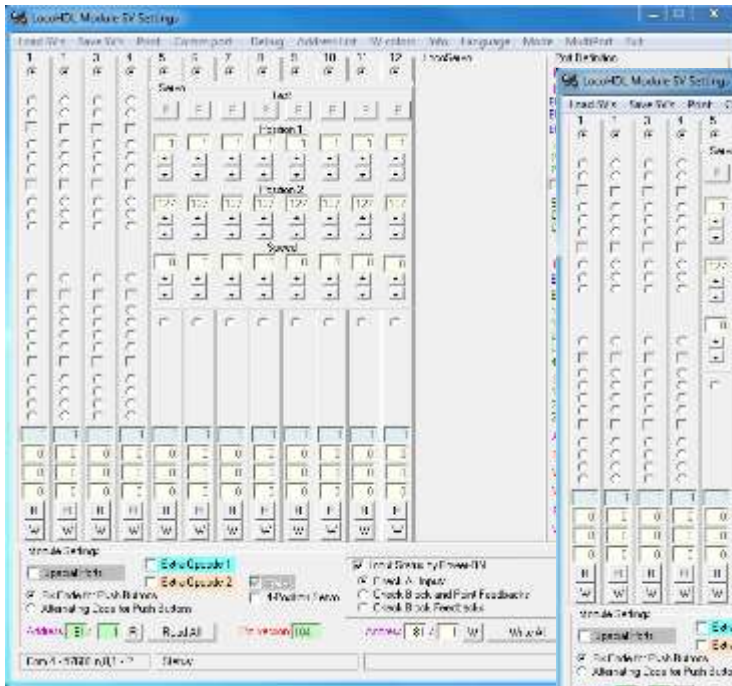
Port 6 has been permanently set to give a feedback message indicating that the output signal is OK. This means there is no short-circuit and the input signal is present. It does not necessarily mean that the Booster output signal is activated (see port 7).

Port 7 is a Fixed Contact Output which switches the Booster output ON or OFF by means of a relays. The relays will **NOT** be switched on with a fixed contact output = ON if one or both feedback are not been available or an OPC_GPOFF (0x82) or OPC_IDLE (0x85) command is received. With a "1-On Fixed Contact" or "2-On Fixed Contact" the Booster, after powering up and when receiving an input signal, will switch on the output. With a "1-Off Fixed Contact" or "2-Off Fixed Contact" the Booster will have to be switched on by a command.

Some Port 7 possibilities:

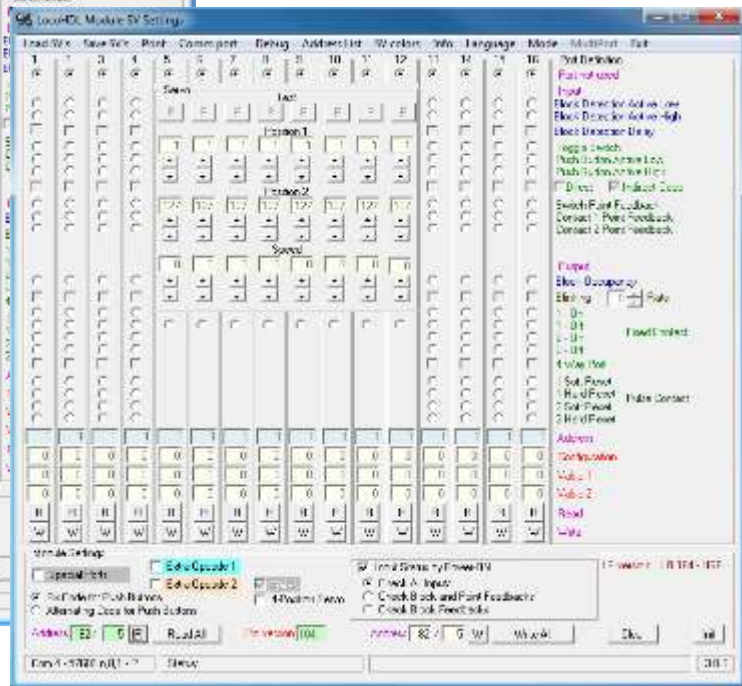
- It can be coupled to a signal to cut the power to a specific track.
- Individual rail sections can be interrupted in case of emergency.

LocoHDL Configuration for LocoServo Module

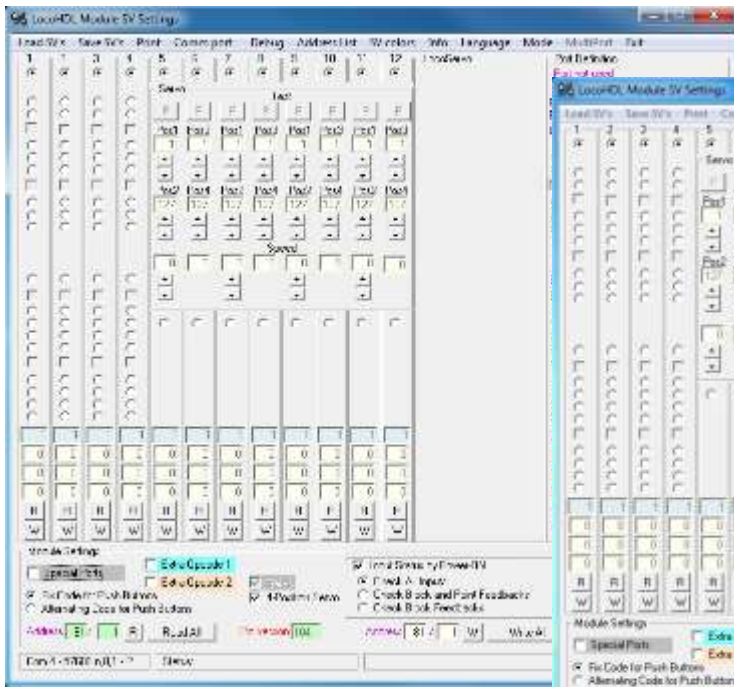


LocoServo Hardware Version 3.1 ->

<- LocoServo Hardware Version 1.0 en 2.0

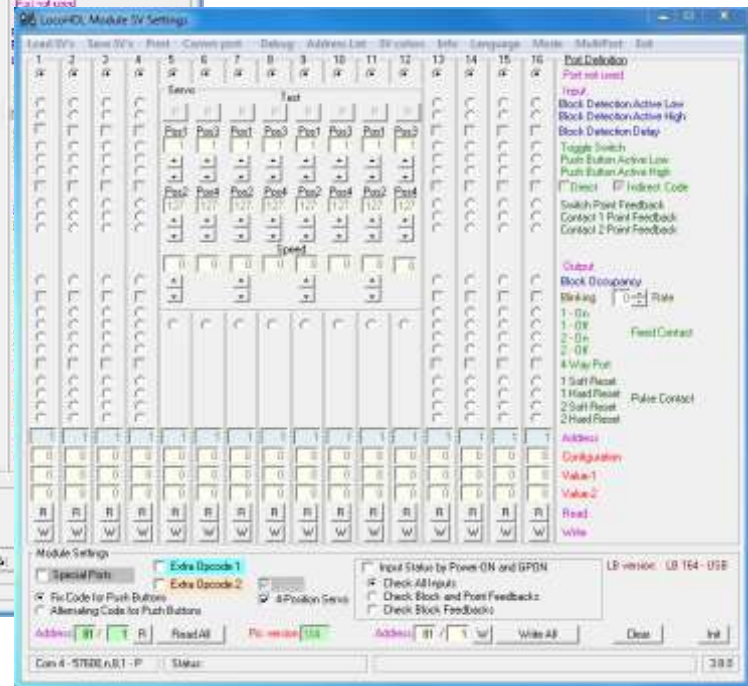


The Servo engine can turn in an angle of 90° from Position 1 = 1 to Position 2 = 127.
 Position 1 and Position 2 can be set within that 90° angle, with a value of 1 to 127.
 The Servo engines are transferred from one position to the other by means of a "Fixed Contact" report.
 The transfer can be done at 4 different speeds.



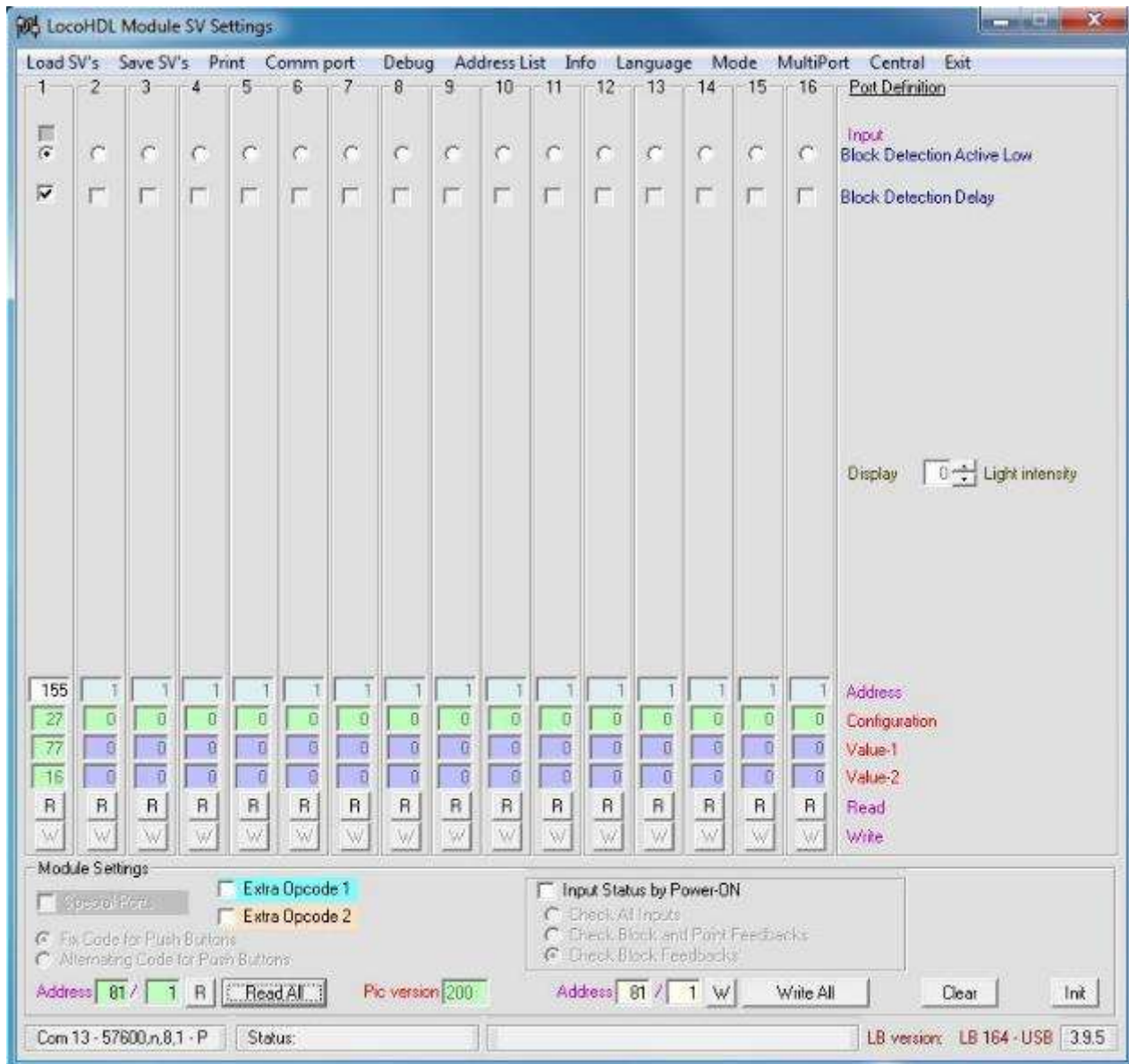
LocoServo Hardware Version 3.1 ->

<- LocoServo Hardware Version 1.0 en 2.0



At selecting 4-Position Servo, 4 Servos to the LocoServo can be driven.

Setting the LocoRCD module with LocoHDL utility

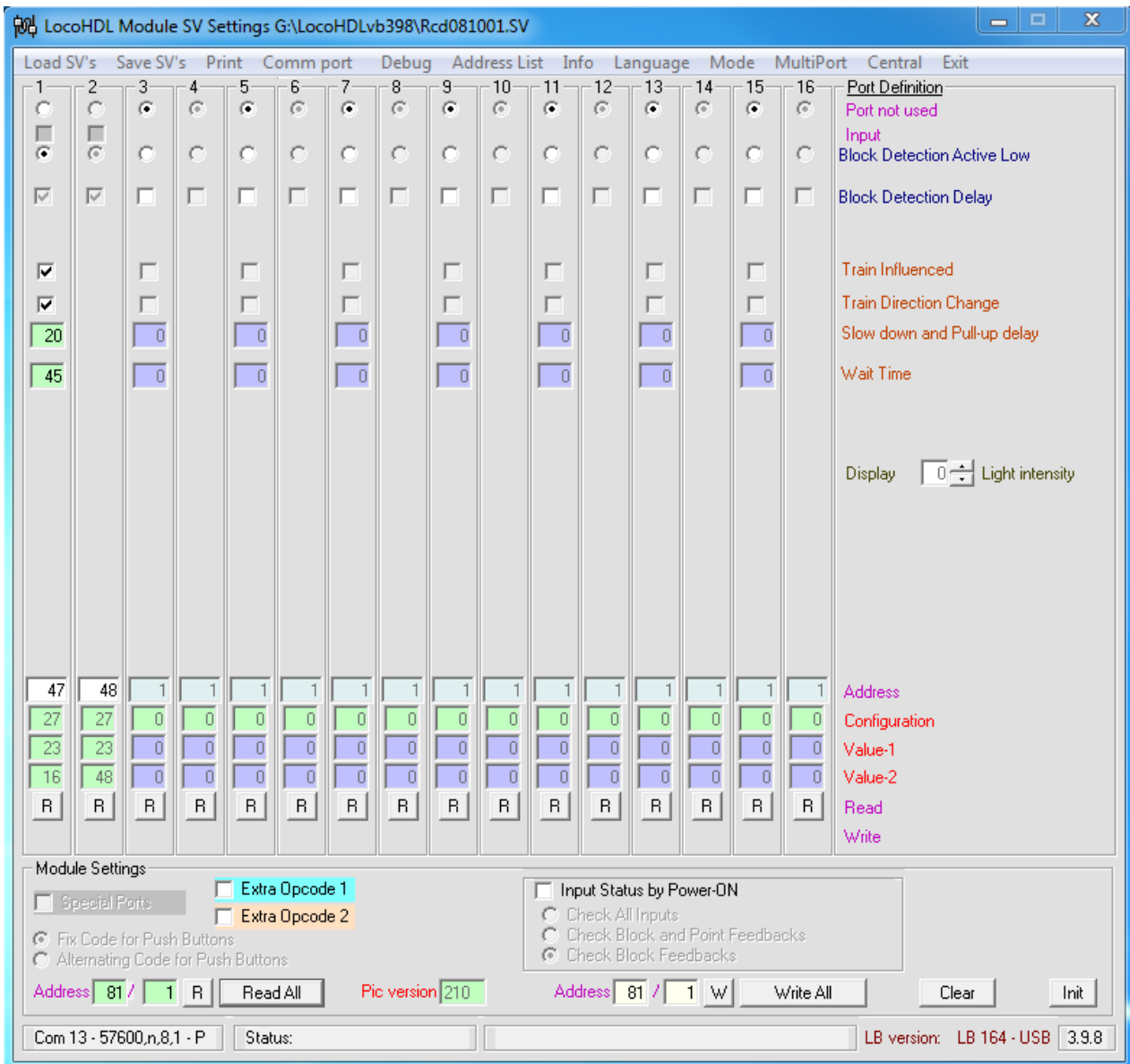


Each LocoRCD module must first be individually adjusted at address 81/1 and then put on another to work. Address (SV1) = 1 ... 79 or 81 ... 127 (80 is reserved for Locobuffer), Default = 81 after initialization. Subaddress (SV2) = 1 ... 126, Default = 1 after initialization.

To set up a first module in LocoRCD with address 81/1 port 1, then change your address to a work address for example 82/1
 Then connect a second LocoRCD module with address 81/1 port 2, then change your address to a work address for example 82/1
 You can work set 16 LocoRCD modules on the same work address.
 The ports should follow one another within the same work address beginning with Poort1, Poort2, etc. ...
 Without a gate in between to let unused.

You can afterwards common change the work address on all LocoRCD if necessary. The block detection address is also in LocoRCD work address changeable.

Setting the LocoRCD2 module with LocoHDL utility



Each LocoRCD2 module must first be individually adjusted at address 81/1 and then put on another to work. Address (SV1) = 1 ... 79 or 81 ... 127 (80 is reserved for Locobuffer), Default = 81 after initialization. Subaddress (SV2) = 1 ... 126, Default = 1 after initialization.

To set up a first module in LocoRCD2 with address 81/1 port 1 and 2. Give both port a unique block detection port address. Then change your address to a work address for example 82/1

Then connect a second LocoRCD2 module with address 81/1 port 2 and 4. Give both port a unique block detection port address. Then change your address to a work address for example 82/1

You can work set 8 LocoRCD2 modules on the same work address.

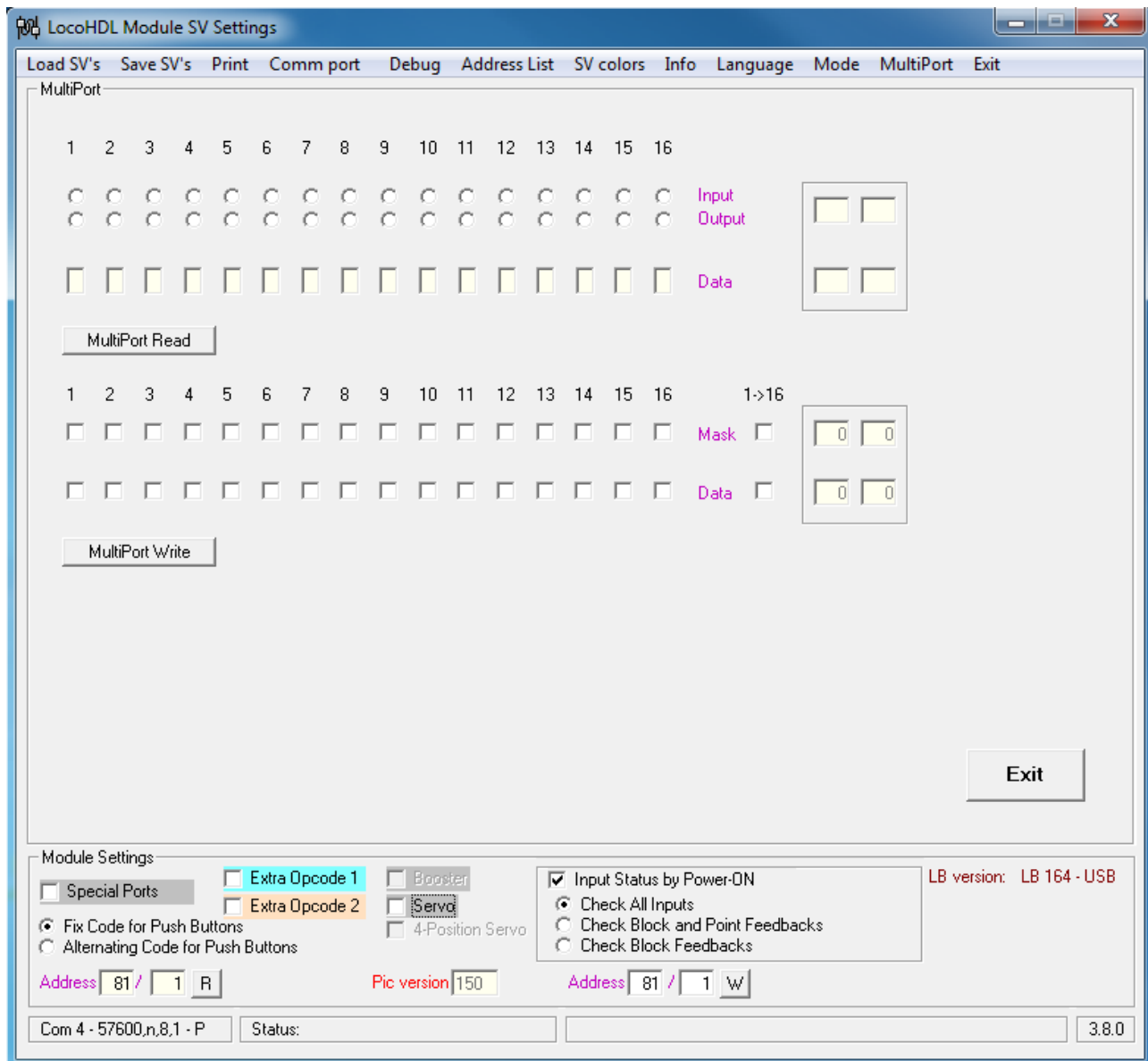
The ports should follow one another within the same work address beginning with Port 1 and 2, Port 3 and 4, etc. ... Without a gate in between to let unused.

You can afterwards common change the work address on all LocoRCD2 if necessary. The block detection address is also in LocoRCD2 work address changeable.

LocoHDL configuration MultiPort Command test

MultiPort

This works only on LocoIO modules.



MultiPort allows you to read all the ports with there functionality and write some or all ports at the same time. A MultiPort command use an OPC_PEER_XFER message

Using the read port function: The command is "04 read ports"

The values returned are:

D5 Low mask: Port 1-8 with 1-port is output, 0-port is input

D6 Low data: Port 1-8 with value of port data

D7 High mask: Port 9-16 with 1-port is output, 0-port is input

D8 High data: Port 9-16 with value of port data

Using the write port function: The command is "03 write ports"

Write function only works on ports which are defined as a output.

To use this function, you send 4 bytes to the LocoIO. These bytes are sent in the D5 – D8 bytes of the OPC_PEER_XFER message. The first byte (D5) is the low mask and maps to the ports 1 to 8. If a bit is set then the port will be updated with the data in the low data byte (D6). If the bit has a zero in it, the port will not be changed.

The same principal applies to the high mask (D7) and the high data byte (D8) for ports 9 to 16.