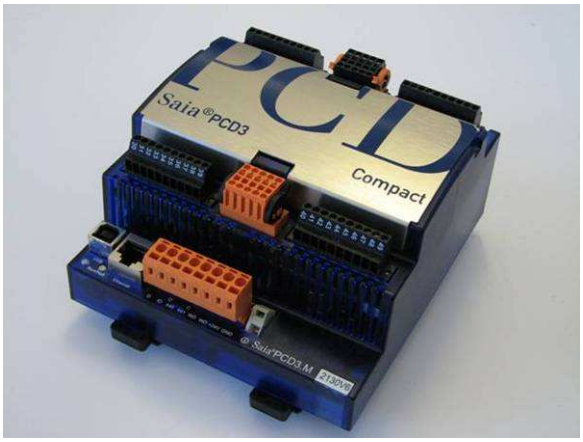
Compact Saia®PCD3.M2x30V6 User's Guide

Introduction



These CPUs are similar as PCD3.M3230 /.M3330 CPUs except that there is no I/O slots (replaced with a compact I/O Board) and no I/O extension connector.
This User's Guide only specifies differences. Please refer to existing PCD3 Hardware Manual (P+P26/789) for the whole feature set.

Content

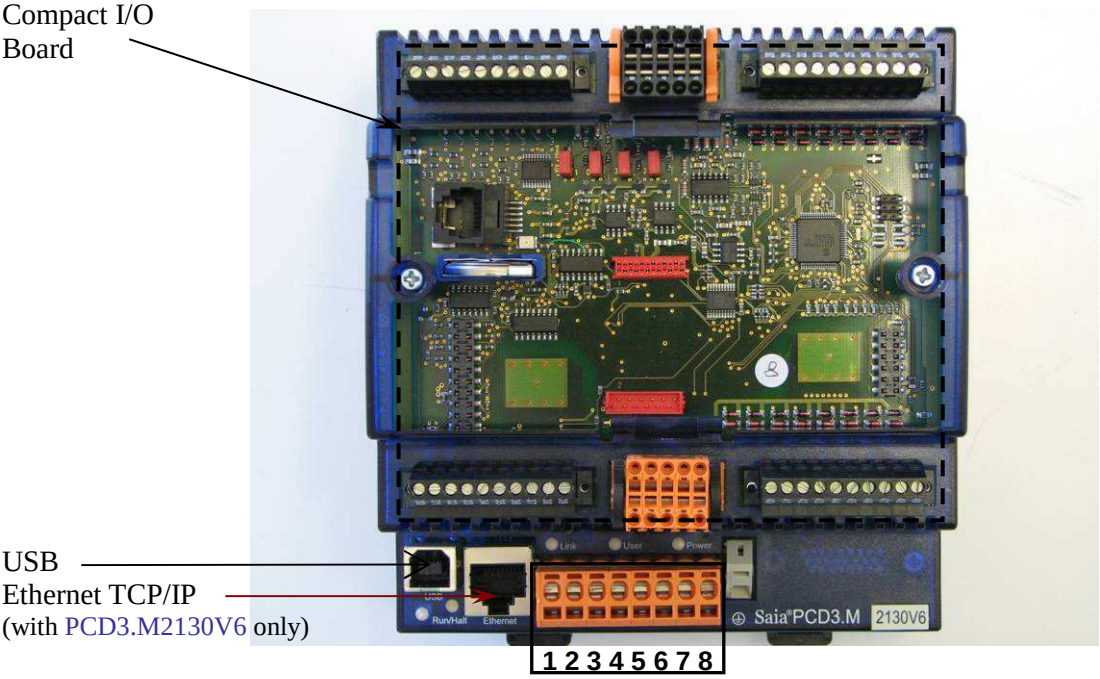
NOTE: THIS PROJECT IS STILL IN DEVELOPMENT; THEREFORE THE FINAL PRODUCT CAN BE SLIGTHLY DIFFER FROM PICTURES AND MENTIONNED SPECIFICATIONS. THANKS FOR YOUR COMPREHENSION

1 CPU characteristics

- Compact size*: 130 × 140 × 75 mm (W × H × D)
- User program memory : 512 KByte RAM
- Flash onboard for user program backup : 512 KByte
- Flash onboard for file system* : 1024 KByte
- USB, RS485, 2 interrupts onboard and integrated Web server
- Ethernet TCP/IP (with PCD3.M2130V6 only)
- Data protection with removable lithium battery* : 1-3 years
- 38 Data points* with compact I/O Board V6:
  - 20 Digital Inputs (DI): 15..30 VDC, 0.3 ms "ON"-Delay. The first 6 of them are configurable either as
    - 6 standard inputs or
    - 2 counters with enable input and 2 standard inputs or
    - 2 encoders A, B and index signal or
    - 4 interrupts and 2 standard inputs
  - 12 Digital Outputs (DO): 24 VDC, 0.5A, transistors
  - 4 Analogue Inputs (AI): 13 Bit +/- 10 V; 12 Bit 0..10 V, 0..20 mA
  - 2 Analogue Outputs (AO): 12 Bit 0..10 V
- 1 port* (socket A) for PCD7.F1xx (with restriction see chap. 2.7)
- Adequate pluggable screw **terminal blocks included***
- Options: Terminal block with LED (10 poles - 1x plus, 1x ground, 8x I/O signals)

*** Differences with PCD3.M3x30**

Top view of the compact controller without cover



Connection of the CPU (Reminder, like other PCD3 CPUs)

Terminal block for supply, watchdog, interrupt inputs and Port 2				Profibus signal	Profibus wiring
	Pin	Signal	Explanation		
	1	D	Port 2; RS485 up to 115 kbps usable as free user interface or Profi-S-Bus up to 187.5 kbps (PCD3.M3xxx only)	RxD/TxD-N	A green
	2	/D		RxD/TxD-P	B red
	3	Int0	2 interrupt inputs or 1 fast counter		
	4	Int1			
	5	WD	Watchdog		
	6	WD			
	7	+24V	Power supply		
	8	GND			
RS485 terminator switch					
Switch position	Designa-tion	Explanation			
left	O	without termination resistors			
right	C	with termination resistors			

2 Compact I/O Board V6: I/O layout & connection

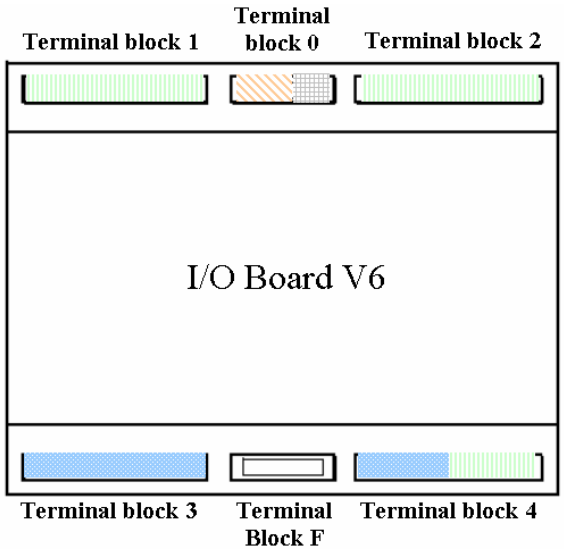
2.1 I/O Layout

20 digitals inputs
15..30 VDC
Typical delay 0.3 ms

12 digitals outputs
24 VDC 0,5A
Transistors

4 analogue inputs
Configuration via jumpers
12 Bit, 0..20 mA, 0..10 VDC
13 Bit, ± 10 VDC

2 analogue outputs
12 Bit, 0..10 VDC



2.2 Pin assignment overview

Pluggable terminal block X0		
0	AI0	Analogue input 0
1	AI1	Analogue input 1
2	AI2	Analogue input 2
3	AI3	Analogue input 3
4	AGND	Analogue GND
5	AGND	Analogue GND
6	AO0	Analogue output 0
7	AO1	Analogue output 1
8	AGND	Analogue GND
9	AGND	Analogue GND

AGND is internal connected to GND and PGND

Pluggable terminal block X1		
10	24V	Supply voltage 24V
11	DI0	Digital input 0
12	DI1	Digital input 1
13	DI2	Digital input 2
14	DI3	Digital input 3
15	DI4	Digital input 4
16	DI5	Digital input 5
17	DI6	Digital input 6
18	DI7	Digital input 7
19	GND	supply GND

Pluggable terminal block X2		
20	24V	Supply voltage 24V
21	DI8	Digital input 8
22	DI9	Digital input 9
23	DI10	Digital input 10
24	DI11	Digital input 11
25	DI12	Digital input 12
26	DI13	Digital input 13
27	DI14	Digital input 14
28	DI15	Digital input 15
29	GND	Supply GND

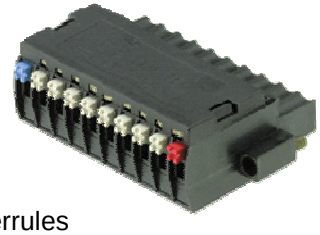
Pluggable terminal block X3		
30	GND	Supply GND
31	DO0	Digital output 0
32	DO1	Digital output 1
33	DO2	Digital output 2
34	DO3	Digital output 3
35	DO4	Digital output 4
36	DO5	Digital output 5
37	DO6	Digital output 6
38	DO7	Digital output 7
39	24V	Supply voltage 24V

Pluggable terminal block X4		
40	GND	Supply GND
41	DO8	Digital output 8
42	DO9	Digital output 9
43	DO10	Digital output 10
44	DO11	Digital output 11
45	DI19	Digital input 19
46	DI18	Digital input 18
47	DI17	Digital input 17
48	DI16	Digital input 16
49	24V	Supply voltage 24V

Pluggable Terminal block XF *	PCD7.F121	PCD7.F110		PCD7.F180
	RS232	*RS485*	*RS422*	*Belimo*
0	PGND	PGND	PGND	PGND
1	TxD	Rx-Tx	Tx	ACom
2	RxD	/Rx-/Tx	/Tx	MST
3	RTS		Rx	IN
4	CTS		/Rx	GND
5	PGND	PGND	PGND	PGND
6	DTR		RTS	
7	DSR		/RTS	
8	COM		CTS	
9	DCD		/CTS	

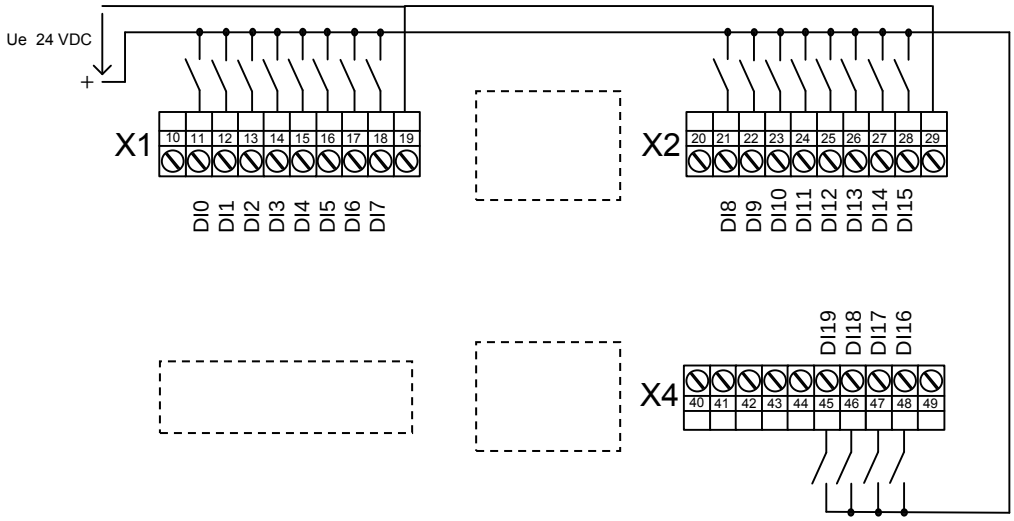
*Same terminal block as delivered with PCD3.F2xx

Terminal block with "Push In" system and LED (optional)

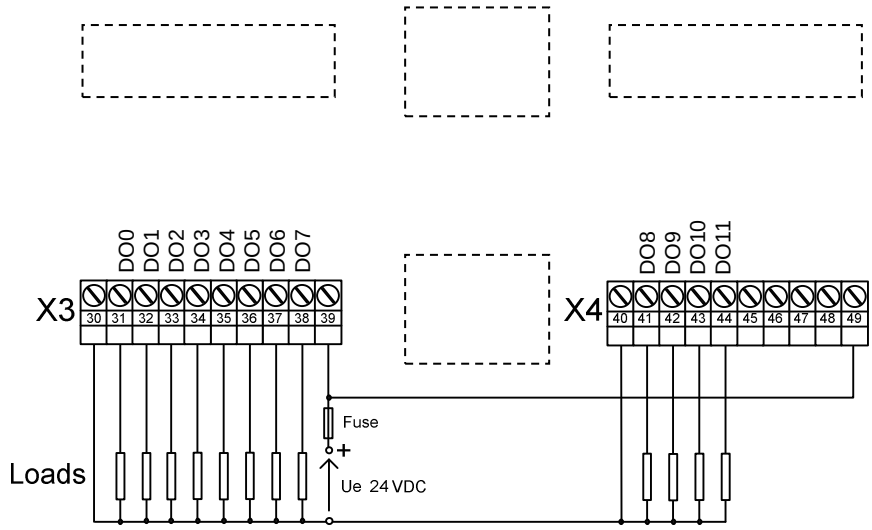


- **Push In**
  - for solid wires (max. 1.5mm²)
  - for flexible wires
  - with or without ferrules
  - 1.5mm² wire size with or without ferrules
- **Easy handling**
  - Simply insert the wire to connect it
  - Push the button to remove the wire
- **LED**
  - Clear and save monitoring of the signals

2.3 Digital inputs connection (Terminal block X1, X2 & part of X4)

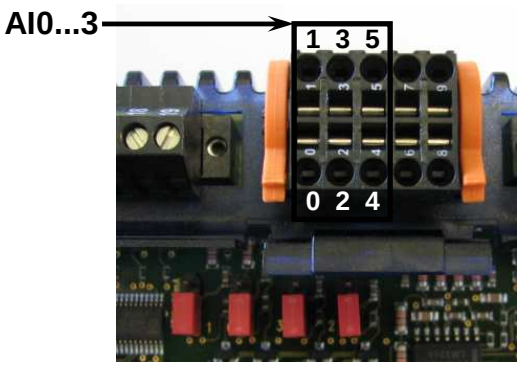


2.4 Digital outputs connection (Terminal block X3 & part of X4)



Fuse: It is recommended that outputs should be separately protected against short-circuits with a fast-blow fuse of max. 6A.

2.5 Analogue inputs connection (Part of terminal block X0 – black)



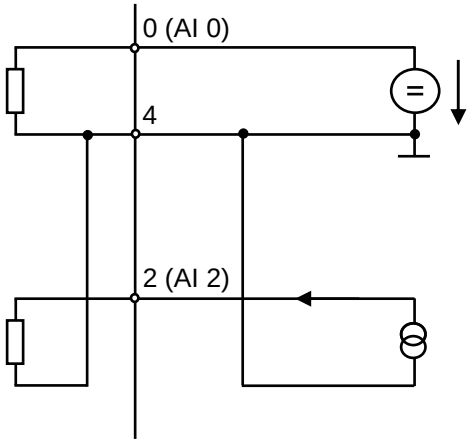
AI0 1 2 3 Jumpers for Inputs voltage/current range

- Position "± 10 V" : Voltage output (lower position - Default)
- Position "± 20 mA": Current output (higher position)

Remark: The jumper's order on first HW version is 1 0 3 2 (from the right to the left).

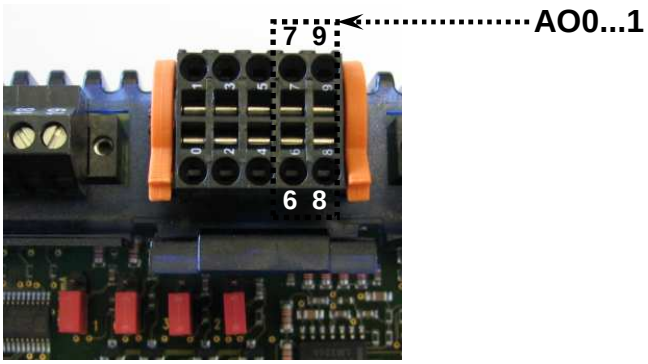
Changing the jumpers
Throughout the circuit board there are components which are sensitive to electrostatic discharges.
Change jumpers without power supply only.

Connection concept
Connection for 0...10V



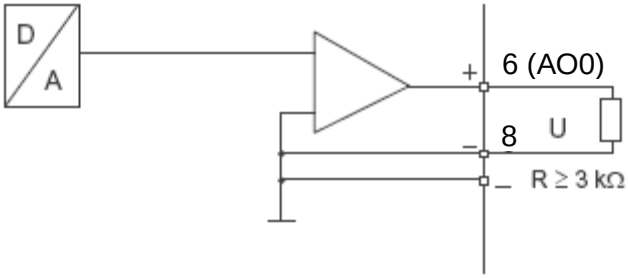
Connection for 0...20 mA

2.6 Analogue outputs connection (Part of terminal block X0 - black)



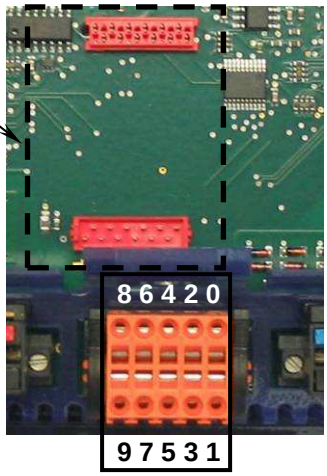
Connection concept

Connection for 0...10V



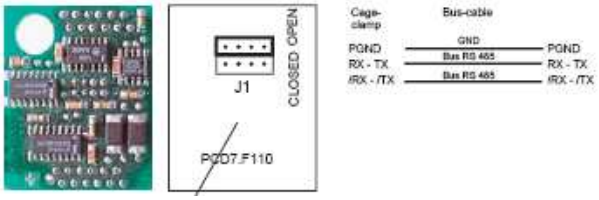
2.7 Communications interfaces connection (Bottom middle terminal block XF - orange)

Socket A



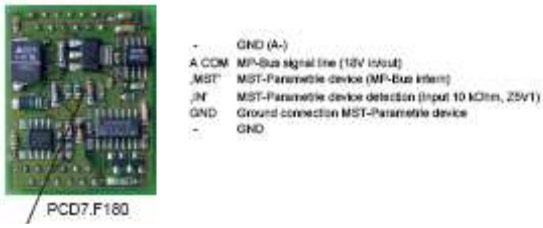
Possible PCD7.F1xx module overview:
(Optional & pluggable on socket A)

PCD7.F110 Serial interface module RS 422 / RS 485



PCD7.F121 Serial interface module RS 232, suitable for modem connection

PCD7.F180 Serial interface module for Belimo MP-BUS, max. 8 actuators and sensors connectable



Restriction: The not mentioned PCD7 modules are not allowed on the compact CPU due the limited power consumption (power dissipation at the limit).

Pin connection table:

RS232

0	PGND	TxD	1
2	RxD	RTS	3
4	CTS	PGND	5
6	DTR	DSR	7
8	COM	DCD	9

RS422

0	PGND	Tx	1
2	/Tx	Rx	3
4	/Rx	PGND	5
6	RTS	/RTS	7
8	CTS	/CTS	9

RS485

0	PGND	Rx-Tx	1
2	/Rx-/Tx		3
4		PGND	5
6			7
8			9

Belimo MP-Bus

0	PGND	Acom	1
2	MST	IN	3
4	GND	PGND	5
6			7
8			9

2.8 Changing the battery

- Remove the Controller cover
- Push slightly toward the front the locking clip
  (See arrow on the picture)
- Remove Battery
- Insert CR 2032 coin cell in such a way that the positive pole is in contact with the locking clip, the light must switch off.

Light Battery Fail

CPU type	Buffer	Buffer time
PCD3.M2x30V6	CR 2032 lithium battery	1-3 years[1)]

1) Depending on the ambient temperature; the higher the temperature, the shorter the buffer time

3 PG5 & I/O configuration

Software requirements: PG5 1.4.300 or higher

The IO handling functionalities defines:

- A cyclically media mapping to enables a link between peripheral I/O modules values and the device resources (PCD Media).
- Direct access programming instructions to read value from the peripheral input module and write value to the peripheral output module.

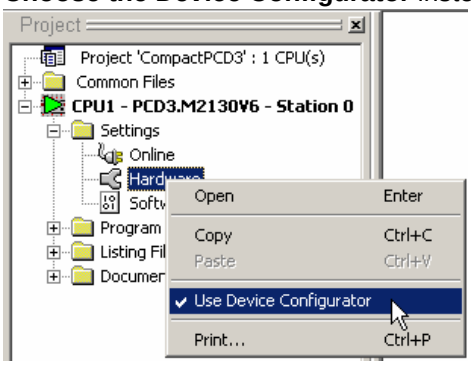
Notes:

- Input/Output handling is always enabled for the PCD3.M2x30V6.
- Via direct access there is no bit access command. The minimal access range is "byte", therefore we recommended to use the media mapping to read/write all I/O channels.

For more details refer to **Preliminary I/O Handling manual**.

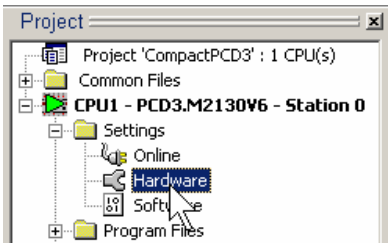
3.1 Hardware configuration – Device Configurator

Choose the Device Configurator instead of the normal Hardware Settings window



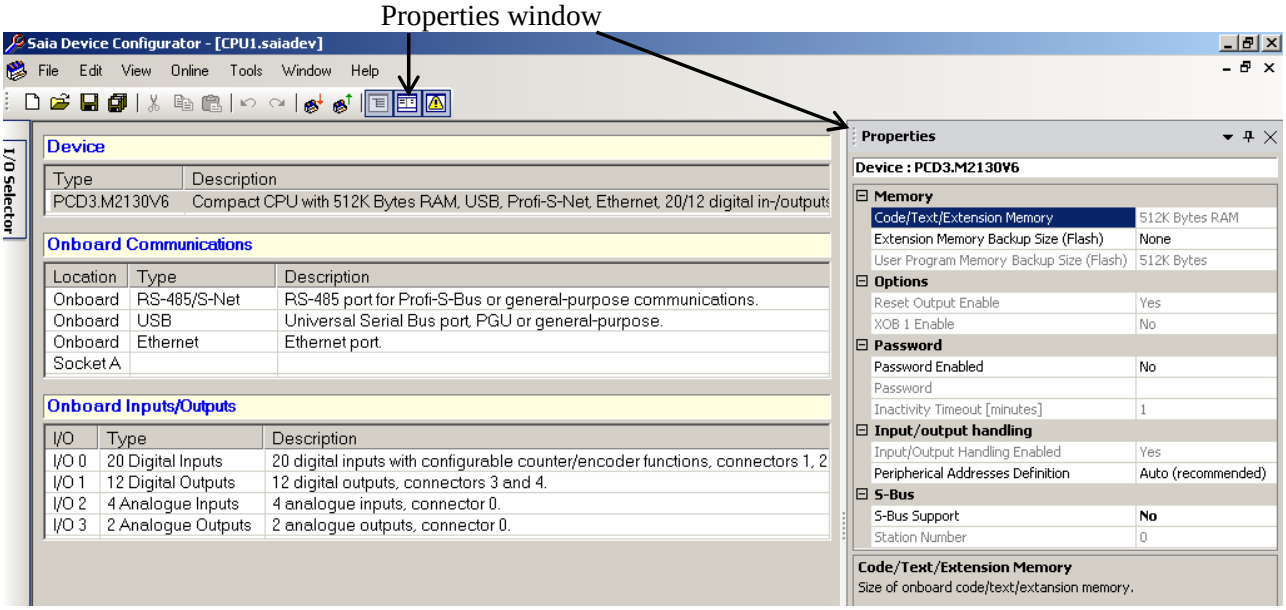
Click right mouse button on "Hardware" and select "Use Device Configurator"

- Starting the Device Configurator



Double click on "Hardware"
The Device Configurator takes longer
to be open/start at the first time (.Net loading)

Device Configurator overview



3.1.1 Digital inputs properties

3.1.1.1 General

All first 6 inputs (0 to 5) can be used either as:

- standard inputs or (chap. 3.1.1.2)
- up to 2 counters with enable input and 2 standard inputs or (chap. 3.1.1.3)
- up to 2 encoders A, B, and index signal or (chap. 3.1.1.4)
- up to 4 interrupts and 2 standard inputs. (chap. 3.1.1.5)

Those multiple modes must be selected under "Input Mode" property.

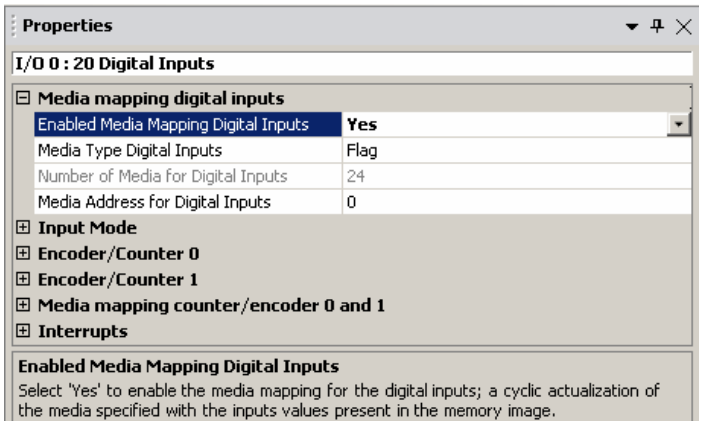
All digital inputs of the PCD3 Compact PC module can be mapped in flags or registers.
Select under "Onboard Inputs/Outputs" the line I/O 0, all corresponding properties appears on the right side.

a) Accessing over flags mapping
   1) Enabled Media mapping
   2) Select "Media" Type as "Flag"
   3) Give first "Media Address" x

The "inputs" flags are updated before COB 0's start with the current input's state:
Example: x=0

- F0 = DI0
- F1 = DI1
- ...
- F19 = DI19

Remark: F20 to F23 will be put to '0' value

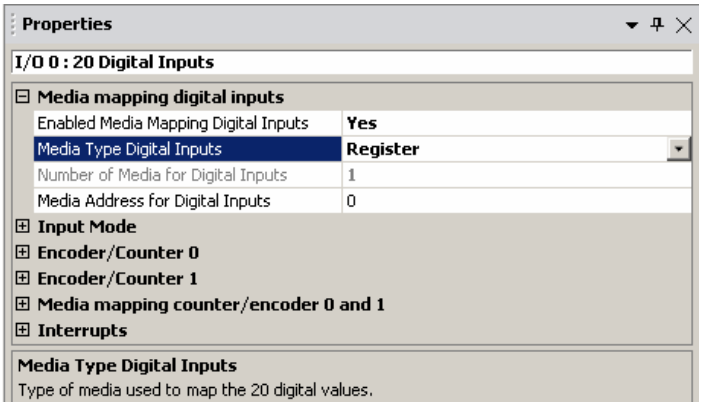


b) Accessing over registers mapping
   1) Enabled Media mapping
   2) Select "Media Type" as "Register"
   3) Give first "Media Address" x

The "input" registers are updated before first COB's start, with the current input's state:

- Bit0 of Rx = DI0
- Bit1 of Rx = DI1
- ...
- Bit19 of Rx = DI19

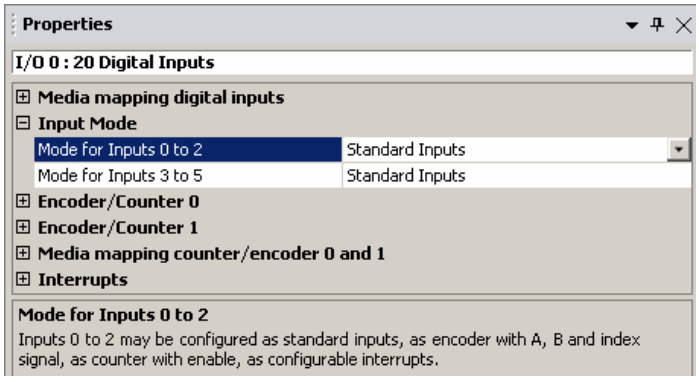
Remark: Bit20 to Bit31 of Rx will be put to '0' value



3.1.1.2 Standard inputs

a) Input Mode

Select "Mode for Inputs 0 to 2" and "Mode for Inputs 3 to 5" as "Standard Inputs" *(defined as default Input mode)*

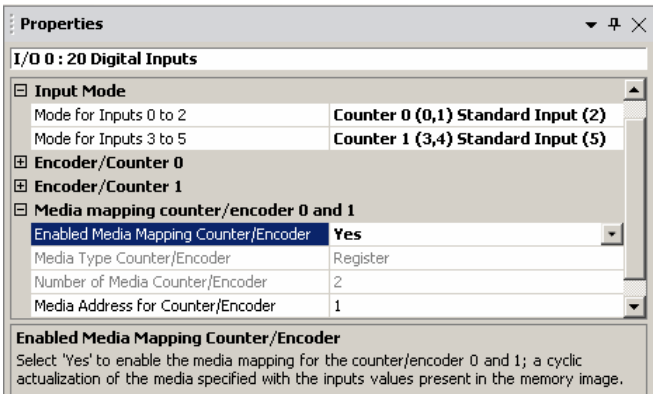


3.1.1.3 Counters with enable input

a) Input Mode

Select "Mode for Inputs 0 to 2" as
"Counter 0 (0,1)..." and/or
"Mode for Inputs 3 to 5" as
"Counter 1 (3,4) ..."

Input 1 and input 4 are to enable respectively counter's 0 and 1 count up.



b) Accessing over register mapping

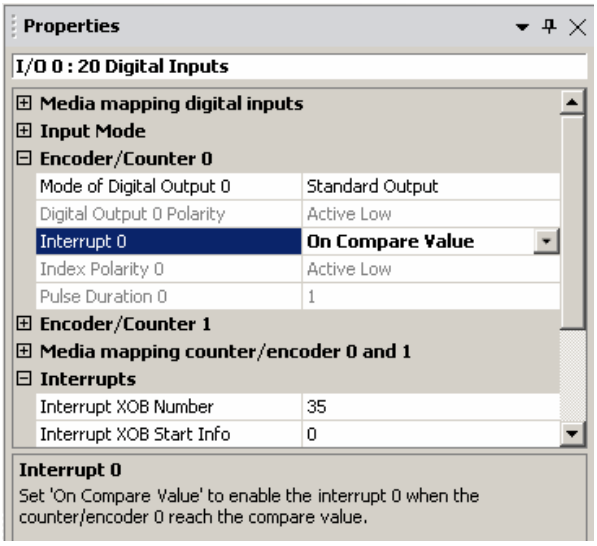
1) Enabled Media mapping
2) Give first "Media Address" y

The "counter" registers are updated before COB 0's start with counter's value:

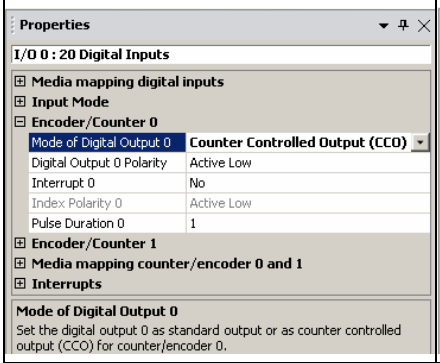
- Ry = Counter 0
- Ry+1= Counter 1

Remarks:
If digital inputs are mapped to flags (see (a) of chap. 3.1.1.1) then example F0, F1 & F3, F4 will show the state of the counter as standard inputs.
Or if digital inputs are mapped to register (see (b) of chap. 3.1.1.1) then Bit0, 1 & Bit3, 4 of Rx will show the state of the counter as standard inputs.

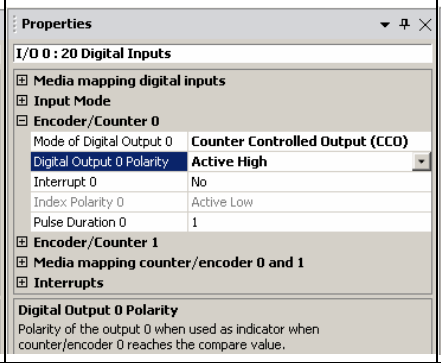
c) Counter's properties (for Counter 0, same for Counter 1)



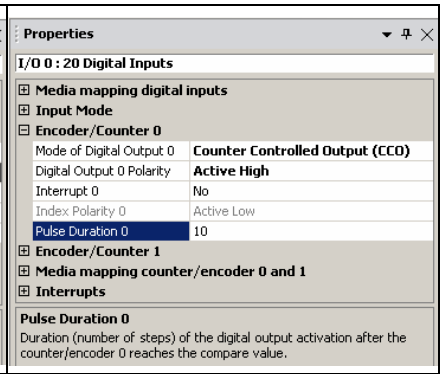
With "On Compare Value" can activate the XOB 35 (selectable) when the counting value is equal to the compare value. *(Default "No")*



Digital output 0 can be use as "CCO" when the compare value of the counter 0 is reached.
(Default "Standard output")

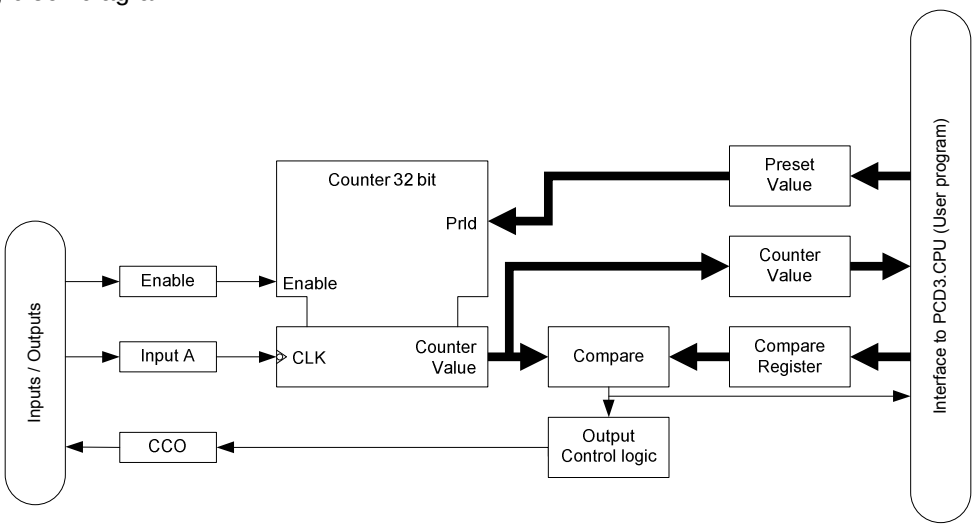


Select the Digital output 0 polarity "Active Low" or "Active high".
In "Active Low" as such that compare value in not reached output is high then goes to low at value reached.
(Default "Active Low")



CCO will stay active during x counting steps before to change state.
(Default "1")

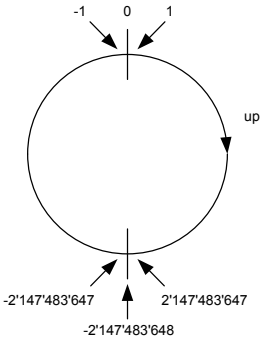
d) Counting block diagram



e) Counting description:
The counter has following inputs, outputs and configuration possibilities at his disposal:

Counting input (input A):	**Falling edge** causes a counting impulse
Enable input:	The Enable input must be statically high so that the counter counts impulses. (And - connected with software Enable of the PCD)
CCO (output):	**Counter Controlled output**, configurable as comparison value indicator (dynamic). The CCO remains active during a configurable number of counting steps.
Preset Value:	With the writing of the Preset-Value overwrite the current counter value
Counter Value:	Return reading value of the current counter value
Compare register:	The counter value is compared with the Compare Value. As soon as the counter value reached the comparison value, the CCO is switched active or/and a XOB is executed on the PCD. The logic comparison is always sharp-switched with the written of a Compare Values for a comparison. In order to cause a renewed comparison, the Compare register must be rewrite again. With the writing of the Compare Value, the CCO is returns to the initial place; if it is still be active.

f) Counting functions



The counter works as **32 bits of counter**. If the counting value is considered, so the counter works like the opposite represented principle.

Counting area:
-2'147'483'648 ...0…+2'147'483'647

It is counted by achievement of the maximum counter value further upward, so the value jumps to the lowest negative value and counts upward further.
There is not any Overflow-Indication.

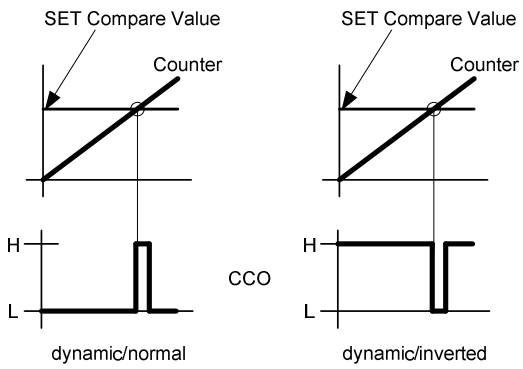
When switching on, the counter is initialized on zero (0).

g) Compare – function and **CCO** (Counter Controlled Output)

The Compare - function compares the counters value with the Compare-register. As soon as the counter value is equal to the compared value, CCO is activated alternatively or respectively a XOB is executed.

With the writing of a new Compare Values, the CCO state returns to the initial state, if the comparison was true.

Possibilities in the PCD user program:
At the event 'reading = Compare Value ' can be caused a XOB.



h) Program instructions:

System symbol names:

Counter x (x= 0 or 1):

Preset value => S.IO.PRESET_VALUE_ENCODER_COUNTER_x
Compare value => S.IO.COMPARE_VALUE_ENCODER_COUNTER_x
Counter value => S.IO.COUNTER_ENCODER_x

Counter's initialization (for counter 0, same for counter 1 using corresponding system symbol name):

1) Loading of the Preset value with following list instruction

```
WRP     S.IO.PRESET_VALUE_ENCODER_COUNTER_0     ; ex. value from R100 is written
        R 100                                   ; into system preset_value_counter
```

2) Loading of the Compare value with following list instruction

```
WRP     S.IO.COMPARE_VALUE_ENCODER_COUNTER_0    ; ex. value from R101 is written
        R 101                                   ; into system compare_value_counter
```

Counter value:

Reading of this last value through one destination register with following instruction

```
RDP     S.IO.COUNTER_ENCODER_0
        R 102
```

This value can also be cyclically mapped into one register (see (b)).

Interrupts Status:

"On compare value" must be configured for the Interrupt 0

```
RDP     S.IO.INTERRUPT_STATUS       ; Interrupts Status is copied
        R 106                       ; from system Interrupt status into R 106
```

Interrupt Status Byte							
Int D		Int C/ **Enc 1**		Int B		Int A /**Enc 0**	
ILost	**Int**	**ILost**	**Int**	**ILost**	**Int**	**ILost**	**Int**

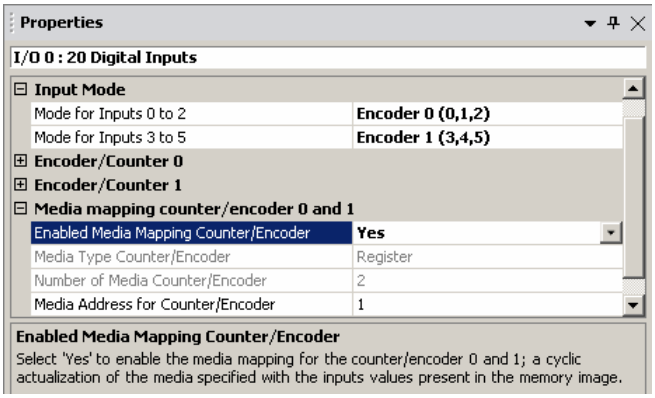
Int	‚1'	Interrupt due edge at the input. In case of a configured interrupt with "Rising and falling edge", it is possible, trough the reading on the corresp. Input, to define the edge. Is the corresp. Input 0: → falling edge. Is the corresp. Input 1: → rising edge
ILOST	‚1'	Interrupt appears, before one already present interrupt was acknowledged.

By reading the interrupt's status Byte, interrupt will be acknowledged!

3.1.1.4 Encoders with A, B and index signal

a) Input Mode

Select "Mode for Inputs 0 to 2" as
"Encoder 0 (0,1,2)" and/or
"Mode for Inputs 3 to 5" as
"Encoder 1 (3,4,5)".



b) Accessing over register mapping

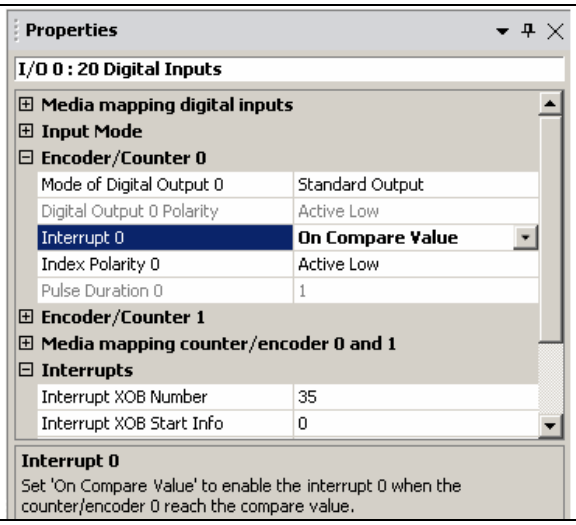
1) Enabled Media mapping
2) Give first "Media Address" y

The "encoder" registers are updated before COB 0's start with encoder's value:

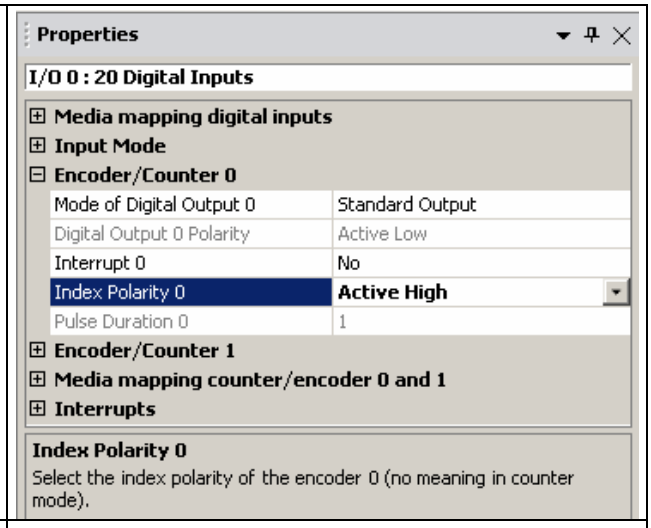
- Ry = Encoder 0
- Ry+1= Encoder 1

Remarks:
If digital inputs are mapped to flags (see (a) of chap. 3.1.1.1) then F0 to F5 will show the state of the encoders as standard inputs.
Or if digital inputs are mapped to register (see (b) of chap. 3.1.1.1) then Bit0 to Bit5 of Rx will show the state of the encoders as standard inputs.

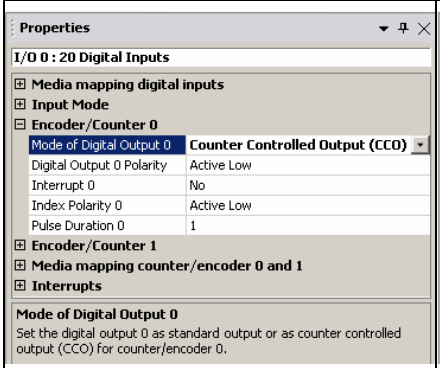
c) Encoder's properties (for Encoder 0, same for Encoder 1)



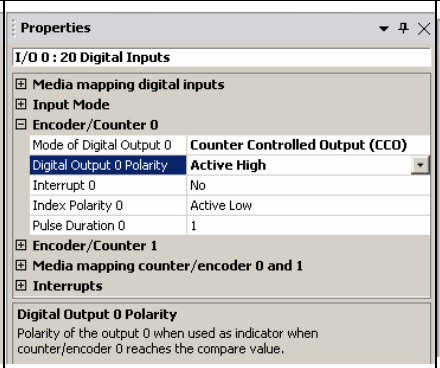
With "On Compare Value" can activate the XOB 35 (selectable) when the counting value is equal to the compare value.
(Default "No")



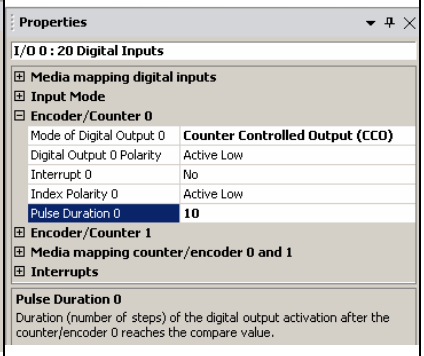
Select the index polarity 0 to determine whether the input 2 is recognized on the rising edge ("Active High") or falling edge ("Active Low").
(Default "Active Low")



Digital output 0 can be use as "CCO" when the compare value of the counter 0 is reached.
(Default "Standard output")

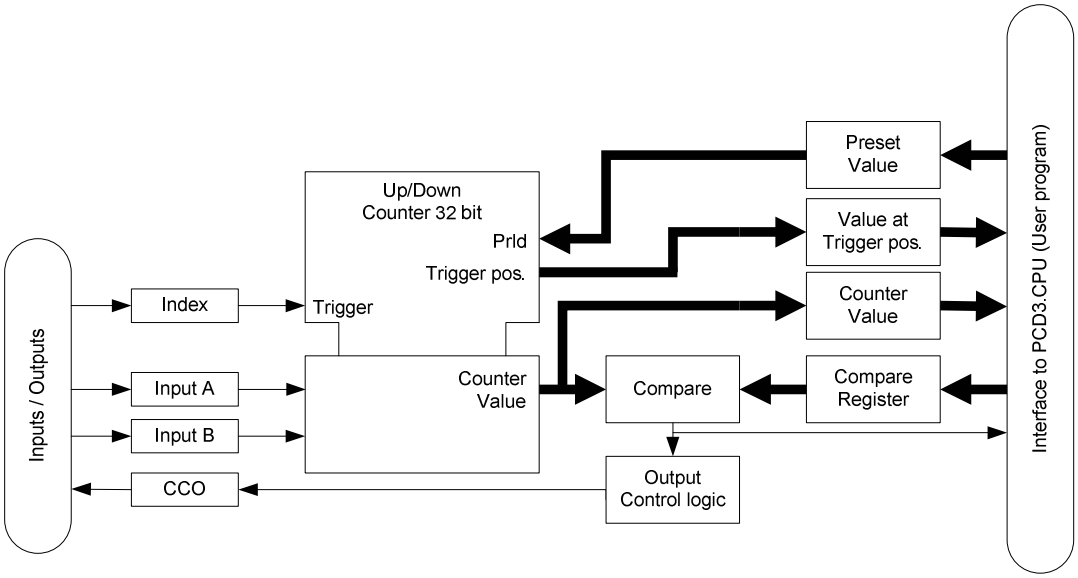


Select the "Digital Output 0 polarity" "Active Low" or "Active high". In "Active Low" as such that compare value in not reached output is high then goes to low at value reached.
(Default "Active Low")



CCO will stay active during x counting steps before to return in initial state.
(Default "1")

d) Encoding block diagram

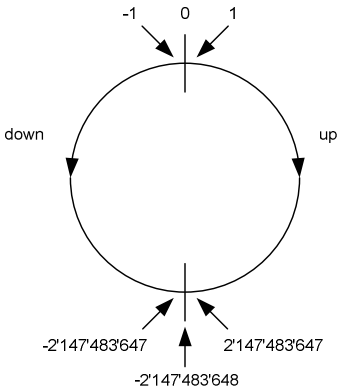


e) Encoding description:

The encoder has following inputs, outputs and configuration possibilities at his disposal:

Counting inputs: (Input A and B)	Counting inputs A and B are designed for the connection of Encoder's signals The counting act for rising and falling edge of both signals, the counting direction result in the phase position of both Signal A and B.
Trigger (index):	With the Trigger – Input (Index) the counter is reset to 0 by an external event. The 'old' counting state will additionally memorise and can be read back after. The Trigger's control is by user program enabled and is active until that the event comes. Afterwards the counter runs as usual.
CCO (output):	**Counter Controlled output**, configurable as comparison value indicator (dynamic). The CCO remains active during a configurable number of counting steps.
Preset Value:	With the writing of the Preset-Value overwrite the current counter value
Counter Value:	Return reading value of the current counter value
Compare register:	The counter value is compared with the Compare Value. As soon as the counter value reached the comparison value, the CCO is switched active or/and a XOB is executed on the PCD. The logic comparison is always sharp-switched with the written of a Compare Values for a comparison. In order to cause a renewed comparison, the Compare register must be rewrite again. With the writing of the Compare Value, the CCO is returns to the initial place; if it is still be active.

f) Counting description:



The counter works as **32 bits of counter**. If the counting value is considered, so the counter works like the opposite represented principle.

Counting area:
-2'147'483'648 ...0…+2'147'483'647

It is counted by achievement of the maximum counter value farther upward, so the value jumps to the lowest negative value and counts upward further.
There is not any Overflow-Indication.

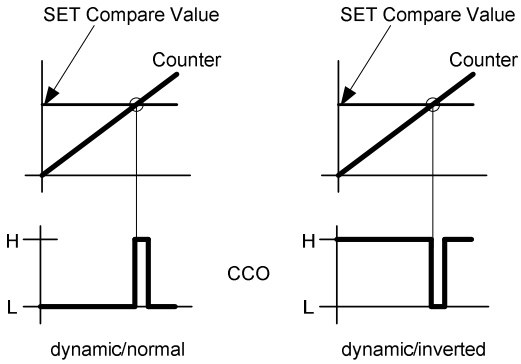
When switching on, the counter is initialized on zero (0).

g) Compare – function and **CCO** (Counter Controlled Output)

The Compare - function compares the counters value with the Compare-register. As soon as the counter value is equal to the compared value, CCO is activated alternatively or respectively a XOB is executed.

With the writing of a new Compare Values, the CCO state is reset, if the comparison was true.

Possibilities in the PCD user program:
At the event 'reading = Compare Value ' can be caused a XOB.



h) Program instructions:

System symbol names:

Encoder x (x= 0 or 1):

Preset value	=> S.IO.PRESET_VALUE_ENCODER_COUNTER_x
Compare value	=> S.IO.COMPARE_VALUE_ENCODER_COUNTER_x
Counter value	=> S.IO.COUNTER_ENCODER_x
Set encoder RefMode	=> S.IO.REF_MODE_ENCODER_0_AND_1
RefMode Status	=> S.IO.ENCODER_x_STATUS_REF_MODE
RefCounter Value	=> S.IO.ENCODER_x_REF_COUNTER

Encoder's initialization (for encoder 0, same for encoder 1 using corresponding system symbol name):

1) Loading of the Preset value with following list instruction

```
WRP     S.IO.PRESET_VALUE_ENCODER_COUNTER_0     ; ex. value from R100 is written
        R 100                                   ; into system preset_value_counter
```

2) Loading of the Compare value with following list instruction

```
WRP     S.IO.COMPARE_VALUE_ENCODER_COUNTER_0    ; ex. value from R101 is written
        R 101                                   ; into system compare_value_counter
```

Encoder value:

Reading of this last value through one destination register with following instruction

```
RDP     S.IO.COUNTER_ENCODER_0                  ; in DWord
        R 102
```

This value can also be cyclically mapped into one register (see (b)).

Reference mode:

1) Start the reference mode of encoder with following instruction (valid for both encoders)

```
WRPB    S.IO.REF_MODE_ENCODER_0_AND_1           ; in Byte
        R 103
```

R value	0	No Influence for both encoder
	1	The encoder 0 will be switch in Reference mode & no influence on encoder 1
	16	The encoder 1 will be switch in Reference mode & no influence on encoder 0

2) Read the mode of the encoder with following instruction

```
RDPB    S.IO.ENCODER_0_STATUS_REF_MODE          ; in Byte
        R 104
```

MODE	‚0'	The encoder is not in the Reference mode
	‚1'	The encoder is in Reference mode

3) Reading of counter value since the Set Reference mode to index signal through one destination register with following instruction

```
RDPW    S.IO.ENCODER_0_REF_COUNTER              ; in Word
        R 105
```

Interrupts Status:

```
RDP     S.IO.INTERRUPT_STATUS     ; Interrupts Status is copied
        R 106                     ; from system Interrupt status into R 106
```

Interrupt Status Byte							
Int D		Int C/ **Enc 1**		Int B		Int A /**Enc 0**	
ILost	**Int**	**ILost**	**Int**	**ILost**	**Int**	**ILost**	**Int**

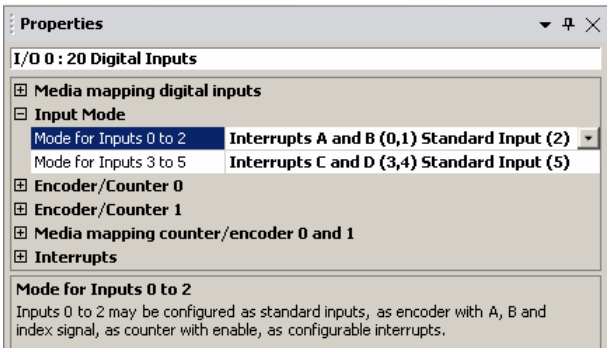
Int	‚1'	Interrupt due edge at the input. In case of a configured interrupt with "On rising and falling edge", it is possible, trough the reading on the corresp. Input, to define the edge. Is the corresp. Input 0: → falling edge. Is the corresp. Input 1: → rising edge.
ILOST	‚1'	Interrupt appears, before one already present interrupt was acknowledged.

By reading the interrupt's status Byte, interrupt will be acknowledged!

3.1.1.5 Interrupts

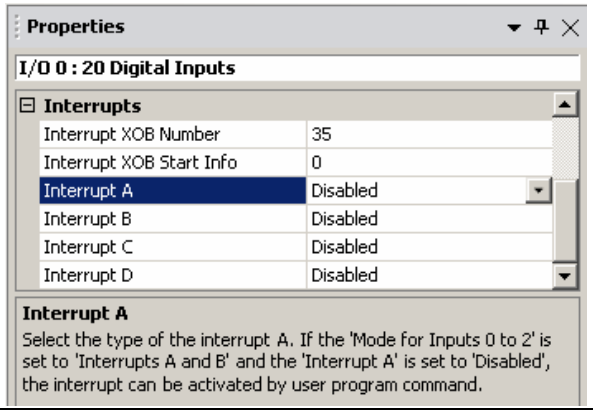
a) Input Mode

Select "Mode for Inputs 0 to 2" as
"Interrupts A and B (0,1)..."
and "Mode for Inputs 3 to 5" as
"Interrupts C and D (3,4)..."

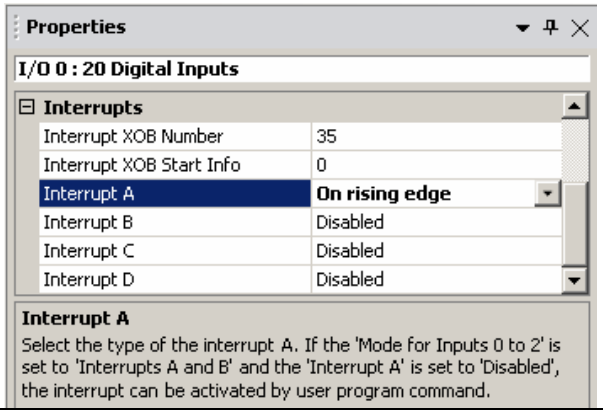


Remarks:
If digital inputs are mapped to flags (see (a) of chap. 3.1.1.1) then example F0 to F5 will show the state of the interrupts as standard inputs.
Or if digital inputs are mapped to register (see (b) of chap. 3.1.1.1) then Bit0 to Bit5 of Rx will show the state of the interrupts as standard inputs.

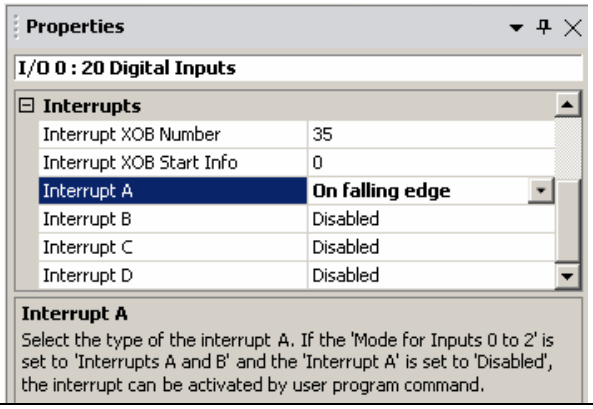
b) Interrupt's properties (for Interrupt A, same for Interrupts B, C & D)



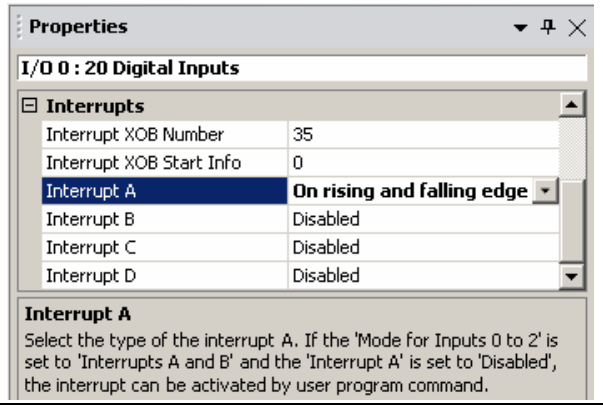
If Interrupt A is disabled, it can be configure by the user program to activate the XOB 35 (selectable).
Read next chapter -- (Default "Disabled")



Interrupt A will activate XOB 35 if the input 0 goes from low to high ("On rising edge").



Interrupt A will activate XOB 35 if the input 0 goes from high to low ("On falling edge").



Interrupt A will activate XOB 35 if the input 0 goes from low to high and also from high to low ("On rising and falling edge").

All other interrupts have the same properties and are freely configurable. All interrupts are calling the same XOB. Read the status of all enabled Interrupts into this XOB to run the corresponding program part.

c) Program instructions

System symbol names:

Interrupt's configuration => S.IO.INTERRUPT_CONFIG
Interrupt's status => S.IO.INTERRUPT_STATUS

Interrupts configuration:

The configuration can be done by user program if interrupt's configuration is "Disabled" with following instruction

```
WRP     S.IO.INTERRUPT_CONFIG     ;
        R 99
```

Byte 1		Byte 0	
INTD	**INTC**	**INTB**	**INTA**

INTn (n = A, B, C, D)			
3	2	1	0
'0'	**'0'**	**ENEG**	**EPOS**

EPOS	‚0'	No Interrupt with the rising edge on the input
	‚1'	Interrupt with the rising edge on the input
ENEG	‚0'	No Interrupt with the falling edge on the input
	‚1'	Interrupt with the falling edge on the input

Interrupts Status:

```
RDP     S.IO.INTERRUPT_STATUS     ; Interrupts Status is copied
        R 106                     ; from system Interrupt status into R 106
```

Interrupt Status Byte							
Int D		Int C/ Enc 1		Int B		Int A /Enc 0	
ILost	**Int**	**ILost**	**Int**	**ILost**	**Int**	**ILost**	**Int**

Int	‚1'	Interrupt due edge at the input. In case of a configured interrupt with "Rising and falling edge", it is possible, trough the reading on the corresp. Input, to define the edge. Is the corresp. Input 0: → falling edge. Is the corresp. Input 1: → rising edge
ILOST	‚1'	Interrupt appears, before one already present interrupt was acknowledged.

By reading the interrupt's status Byte, interrupt will be acknowledged!

3.1.2 Digital outputs properties

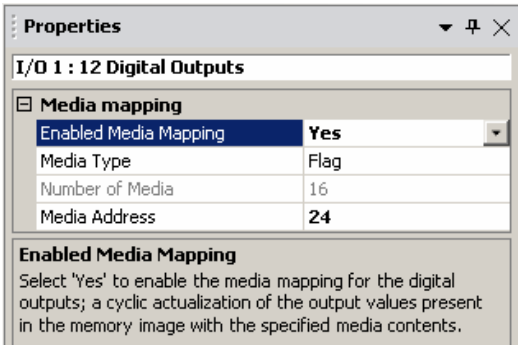
All the digital outputs of the PCD3 Compact PC module can be mapped in flags or registers.
Select under "Onboard Inputs/Outputs" the line I/O 1, all corresponding properties appears on the right side.

a) Accessing over flags mapping
   1) Enabled Media mapping
   2) Select "Media Type" as "Flag"
   3) Give first "Media Address" y

The Flag's states are transferred to outputs DO0 until DO11 at COB's end.
Example: y=24

- DO0 = F24
- DO1 = F25
- ...
- DO11 = F35

F36 to F39 have always '0' bit

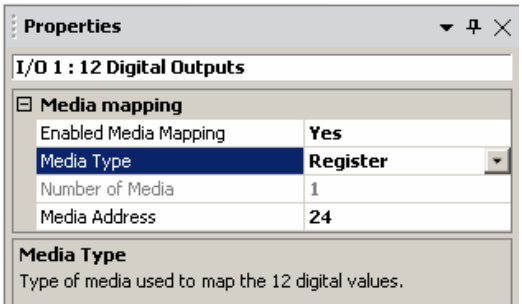


b) Accessing over registers mapping
   1) Enable Media mapping
   2) Select "Media Type" as "Register"
   3) Give first "Media Address" y

The register's value ('Low'-Bits) is transferred to outputs DO0 until DO11 at COB's end:

- DO0 = Bit0 of Ry
- DO1 = Bit1 of Ry
- ...
- DO11 = Bit11 of Ry

Bit12 to Bit31 of Ry have always '0' value



3.1.3 Analogue inputs properties

On the analogue inputs of the PCD3 Compact PC module can be mapped in registers.
Select under "Onboard Inputs/Outputs" the line I/O 2, all corresponding properties appears on the right side.

a) Accessing over registers mapping
   1) Enable Media Mapping
   2) Give first "Media Address" a

The 4 "inputs" registers are updated at the COB 0's start with the current values of analogue inputs:
Example: a=3

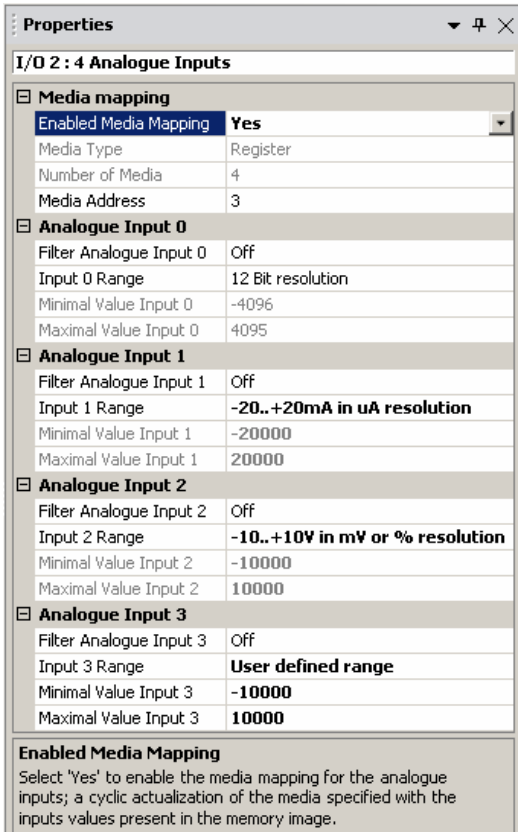
- R3 = AI0
- R4 = AI1
- R5 = AI2
- R6 = AI3

b) Filter activation and Range mode
Filtering: The analogue inputs can be read directly (unfiltered) or a 16 tap floating average filter can be switch "on" to reduce noise

Possible Range mode:

- 12 Bit Resolution *(default)*
  → -4096..4095
- -20..+20mA in uA resolution
  → -20'000..20'000
- -10..+10V in mV or % resolution
  → -10'000..10'000
- User defined range
  (Value between -32'768 and 32'767)

  Remark: Don't forget to place corresponding jumpers for Inputs voltage/current range



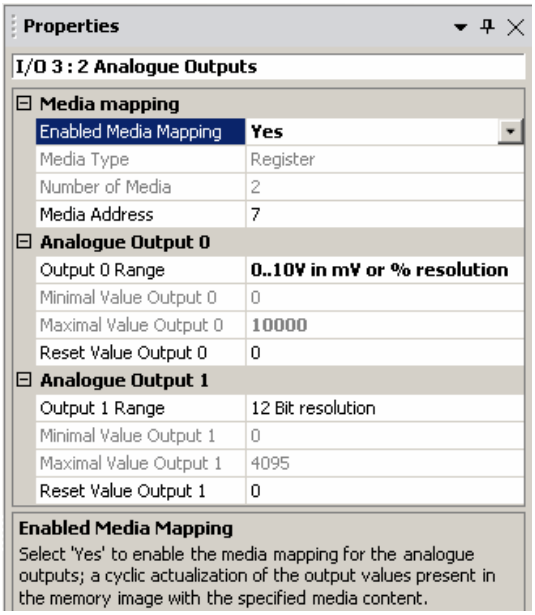
3.1.4 Analogue outputs properties

On the analogue outputs of the PCD3 Compact PC module can be mapped in registers.
Select under "Onboard Inputs/Outputs" the line I/O 3, all corresponding properties appears on the right side.

a) Accessing over registers mapping
   1) Enable Media Mapping
   2) Give first "Media Address" b

The 2 "output" registers value are transferred to analogue outputs at COB's end:
Example: b=7

- AO0 = R7
- AO1 = R8



b) Possible Range mode:

- 12 Bit Resolution *(default)*
  → 0…4095
- 0..10V in mV or % resolution
  → 0...10'000
- User defined range
  (Value between -32'768 and 32'767)

c) Reset Value Output:
Defines the reset value of the output (Power -up initialization)

3.1.5 General remarks:

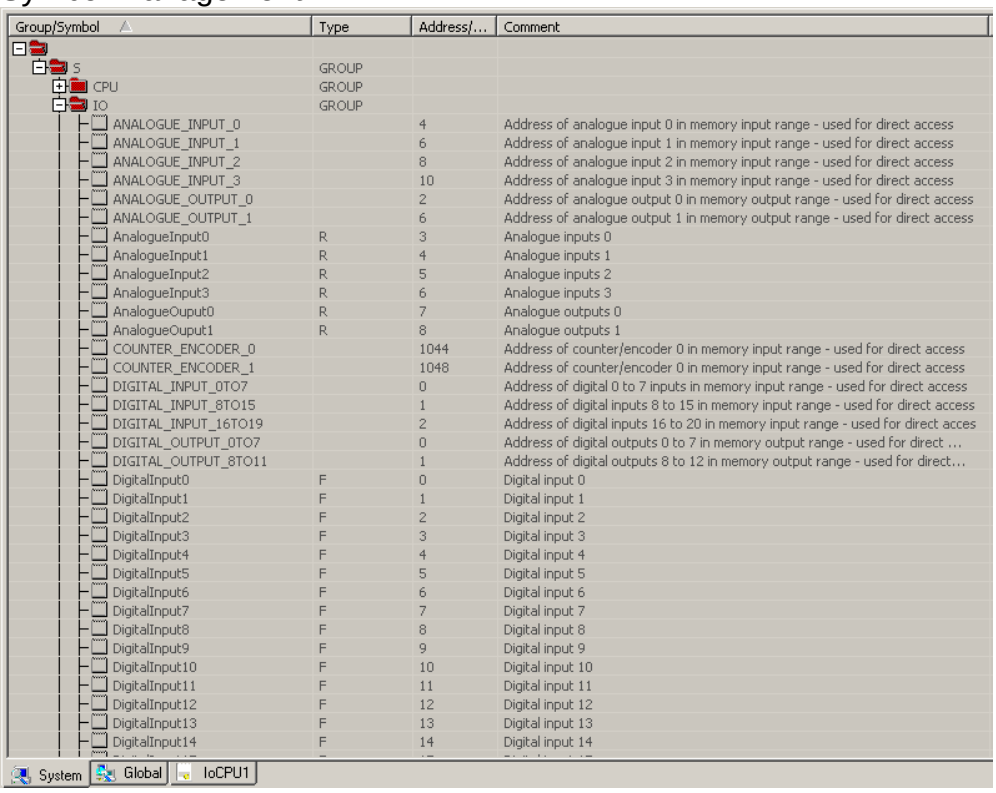
Overlapping are warn in the Messages window

Messages

!	Code	Item	Message
×	ER_1204	I/O 0 : 20 Digital Inputs	Register address range of this slot overlap with other register address range.
×	ER_1205	I/O 1 : 12 Digital Outputs	Flag address range of this slot overlap with other flag address range.

3.2 Programming

Symbol management

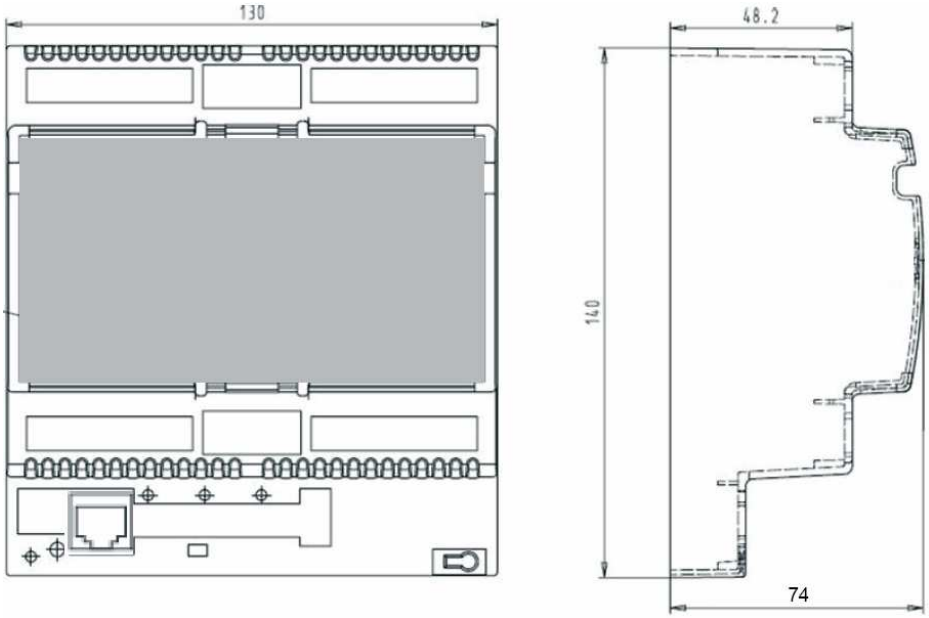


During programming, you can always drag & drop Symbols from "IO Group" under "System Symbol" of the Symbol Editor.

Remark: HMI Editor need "Global Symbol" in this case copy & paste Symbols from "System Symbol".

4 Dimension drawing

Valid for both controllers PCD3.M2130V6 and PCD3.M2030V6 without Ethernet connection



Ordering information

Type	Description	Weight
	Base units with 38 data points	
PCD3.M2130V6	CPU with 512 Kbytes user program, backup with onboard Flash memory, USB port for PG5, 2 Interrupts, Web-Server, RS 485, 32 digital I/O and 6 analogues I/O, 1 port (socket A) for PCD7.F1xx, Ethernet TCP/IP data protection 1-3 years, terminal blocks delivered	750g
PCD3.M2030V6 (In preparation)	Same as PCD3.M2130V6 without Ethernet TCP/IP	750g
4 405 5066 0 	Optional Pluggable "Push-in" terminal block with LED, 10-pole, as connector for X1, X2, X3 & X4	12g

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F +41 26/672 74 99
pcd@saia-burgess.com
www.saia-burgess.com

Product support.
Technical reference website: www.sbc-support.ch
Other addresses: www.saia-burgess.com - Contact

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