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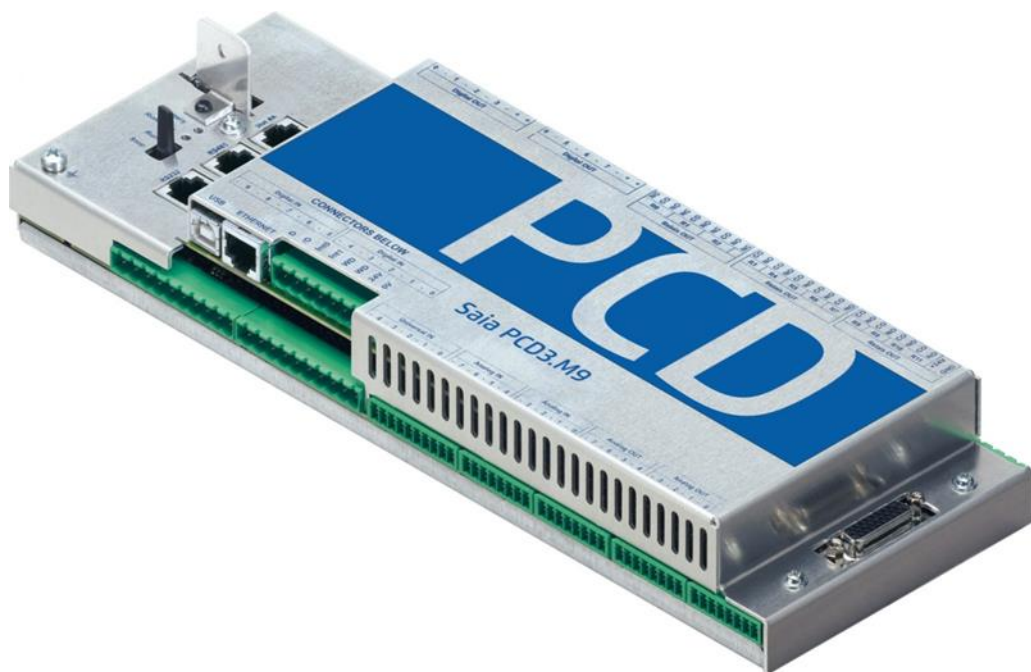
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# User Manual

# PCD3.M9



<u>Revision History</u>			
Date	Modification	Asked by:	Version
2008-09-08	Page 8: Added info bottom of the page	--	Rev. 1
2008-09-23	Page 21: Pt. 9.1.1	--	Rev. 2
2008-12-12	Name for the controller and procedure to loading the Fbox Pag16	--	Rev. 3
2009-01-09	Several pages have been modified	--	Rev. 4
2009-02-09	Several pages have been modified: 9 / 10 / 11 / 16 / 18	--	Rev. 5
2009-07-01	Page 6: Description of Connector X13 corrected	--	Rev. 6
2009-10-20	- Page 8: ( changed page "passiv input" not correct ) - Add Hardware settings information	--	Rev. 7
2009-12-10	- Change info page 13 (X13), change info page 4 (1), added note page 19	RM/DS	Rev. 8
2010-01-06	- Add note on page 17	--	Rev. 9
2010-01-11	- Page 24 "Digital output and the Relays outputs are writable only" - Page 15 & 22 "Analogue Inputs"	DS/CD	Rev. 10
2010-06-25	- Information added Run/halt push button (Page 9) - Change information input resistance (Page 11) - Added Additional Documents (Page 30)	DS/RM DS DS	Rev. 11 Rev. 11 Rev. 11
2014-01-21	- Change of Logo	MüRo	Rev. 12
2014-03-04	Pin numbering of module PCD7.F180S on X15 added	RiLo	Rev. 13
2014-06-06	Termination resistors on RS-485 Port 3	HaMa	EN14
2017-11-06	Adaptation for M96	TV	EN15
2019-08-09	Changed the phone number	HaMa	ENG16

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# 1 Introduction

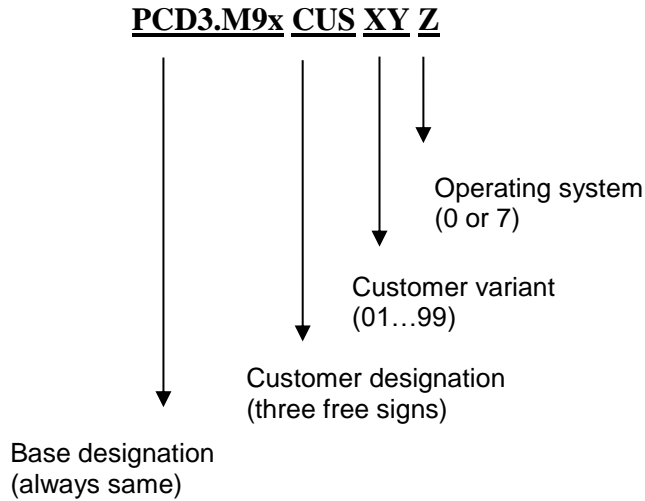
The OEM Controller is previewed for OEM customers in infrastructure applications. It is based on a PCD3 CPU with a dedicated I/O Board. A metal housing protects the electronic.

The system can be extended with one standard PCD3 extension or with the PCD3.C90.

## 1.1 ASN Name

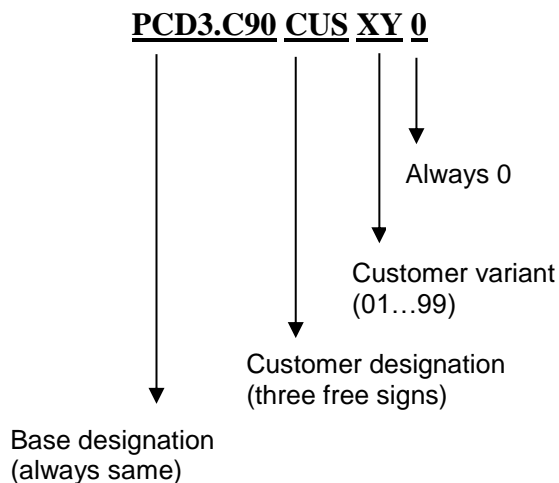
OEM Controller                    PCD3.M9

### Base unit:



OEM Extension                    PCD3.C90

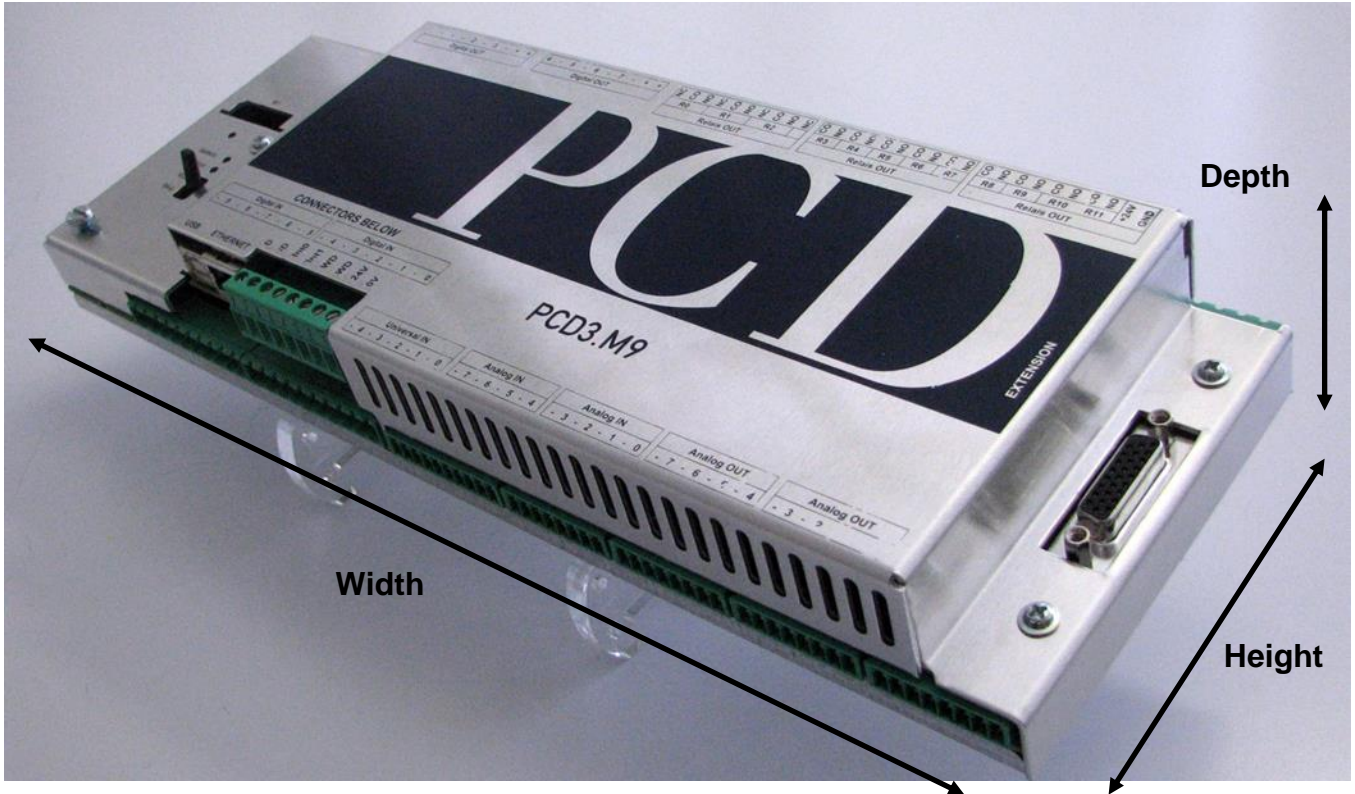
### Extension unit:



## 2 Mechanical data

### 2.1 Main Unit

The PCD3 based CPU is mounted on the dedicated I/O board:

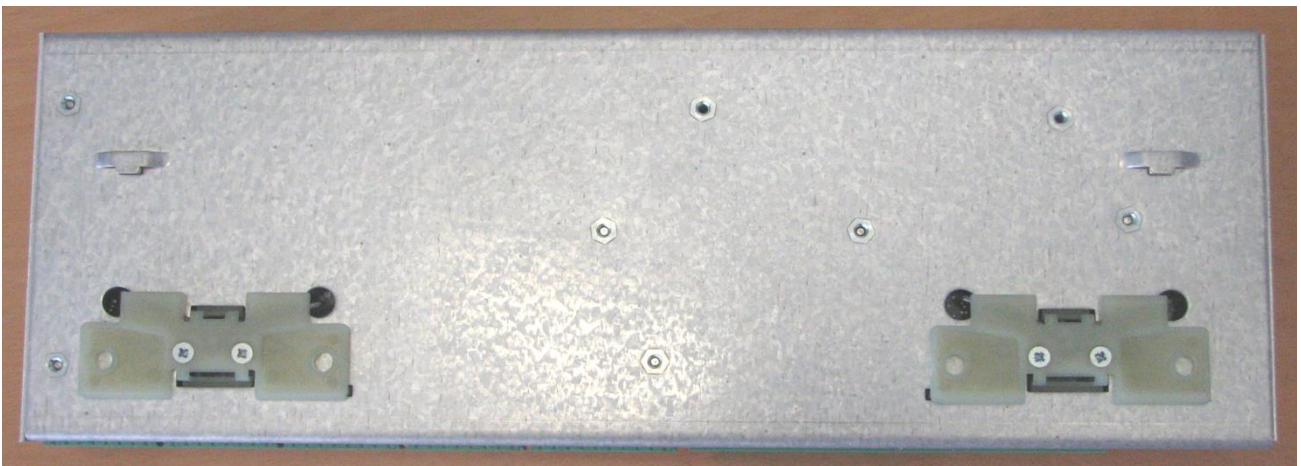


#### 2.1.1 Dimensions including CPU

Width: 315 mm  
Height: 130 mm (with the connectors)  
Depth: 44 mm (from DIN rail)

#### 2.1.2 Fixation

The back plate is equipped with two DIN rail fixations that the system can be mounted on a single DIN rail, the backplane is on PGND potential.



### 3 Functions

#### 3.1 Main Unit

CPU PCD3.M96:

- 2 MB Flash (Main memory for user program) /  
1 MB Flash (Main memory for text) /  
16 MB flash backup memory onboard
- Ethernet TCP/IP
- 1x RS-485

On the dedicated I/O board:

- 1x RS-232
- 1x RS-485
- 1x Slot for PCD7.F1xxS module
- 1x Slot M1 for Flash memory module PCD7.R5xx
- 1x Slot M2 for SD card memory PCD7.R-SD up to 512 MB
- Battery Renata CR 2032 Lithium 3 V + supervision
- 10 digital inputs
- 5 digital inputs also configurable as analogues inputs 0 ... 10 V
- 12 relay outputs 250 VAC, 4 A (4 of them with change over contact, 3 connectors)
- 8 digital outputs
- 8 analogue inputs, 12 Bit, 0 ... 10 V / 0 ... 20 mA / PT/Ni1000 / NTC10, selectable per channel with jumpers.
- 8 analogues outputs, 0 ... 10 V, 12 Bit
- I/O Extension module connector

#### 3.2 Options:

PCD7.R5xx Flash Memory Card (For slot M1)

- PCD7.R-550 M04
- PCD7.R-551 M04
- PCD7.R-SD256 SD Flash memory card 256 Mbytes
- PCD7.R-SD512 SD Flash memory card 512 Mbytes

PCD7.F1xxS :

- PCD7.F110S: Serial Interface module RS-422 / RS-485 up to 11.2 kbit/s
- PCD7.F120S: Serial Interface module RS-232 up to 38.4 kbit/s
- PCD7.F130: Serial Interface module current loop 20 mA
- PCD7.F150S: Serial Interface module RS-485  
with galvanic isolation up to 115.2 kbit/s
- PCD7.F180S: Serial Interface module for Belimo MP-Bus,  
max. 8 actuators and sensors connectable

**Note:** For the position of the different elements, please refer you on page 11.

## 4 Technical specifications

### 4.1 General technical data

Supply voltage	24 Vdc ± 10% (smoothed)
Power consumption	max. 12 W (no load current included)
Storage temperature:	-25...+70 °C
Ambient temperature operating:	0...+55 °C
Relative air humidity:	10...95% r.h. non condensing
Protection level:	IP20
Standards	CE: EMC (industrial level), UL: certificated RoHS compliant (2002/95/CE)

### 4.2 Technical data of CPU

(Based on technology PCD3)

Main memory (User program + Text):	2 MB + 1 MB
Backup memory onboard	16 MB
2 interrupt inputs or 1 fast counter	yes
Watchdog relay:	yes
Real Time Clock:	yes
USB 1.1 slave device	yes
Integrated Web/ FTP-Server	yes
RS-485	Port 2 up to 115.2 kBaud
Ethernet-TCP/IP	10/100 Mbit/s
Programmable	with Saia PG5

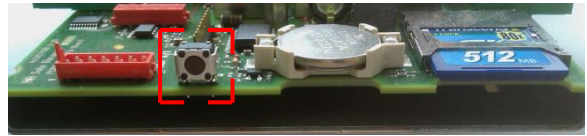
### 4.3 Technical data of Main I/O-Board

#### 4.3.1 General

Battery Socket and Supervision	Renata CR2032, Lithium 3 V
Data protection:	1...3 years with lithium battery
RUN / STOP	Switch
<u>States</u> Stop without Error Run without Error Run with Error Stop with Error Halt	<u>LED Color</u> Dark Green Red / Green Red Red  "Stop with Error" and "Halt" can't be visually distinguished
RS-232	Port 0, up to 115.2 kBaud, full equipped
RS-485	Port 3, (rsp. FDL Port10)
1 slot for PCD7.F1xx module	Port 1
1 slot for PCD7.R5xx module	Slot "M1"
1 slot for SD Card (as option, only PCD3.M9DDC11)	Located on the bottom side of the I/O board mapped as Slot "M2"

### 4.3.2 Run/halt push button

The operating mode can be changed while in use or at start-up:



#### **At start-up:**

If the Run/Halt push button is pressed during start-up and then released again during one of the sequences described below, the following actions may be triggered:

<b>LED sequence</b>	<b>Action</b>
Orange	none
Green, flashing (1 Hz)	Goes into "Boot" state and waits for f/w download
Red, flashing fast (4 Hz);from FW > V 01.08.45	The system starts in the same way as with a flat Super CAP or missing battery, i.e. media (flash, registers etc.), user program and hardware settings are erased. The clock is set to 00:00:00 01.01.1990. The backup on the onboard flash is not deleted.
Red, flashing slowly (2 Hz)	The PLC does not start up and goes into "Stop" mode.
Red/green flashing (2 Hz)	Stored data deleted, i.e. media (flash, registers etc.), user program, hardware settings and the backup on the on-board flash are erased. However, where an external flash card is used, the program is not copied to the onboard flash.

#### **In operation:**

If the button is pressed in run mode for more than ½ second and less than 3 seconds, the controller changes to halt mode and vice versa.

If the push button is pressed for longer than 3 seconds, the last user program saved will be loaded from flash memory.



#### 4.3.3 Digital inputs: X11, X12

Number of inputs:	10, electrically connected, source operation
Input voltage:	Type. 24 VDC smoothed or pulsed H level: 15...30 V L level: -30...+5 V
Input current:	typ. 4 mA at 24 VDC (IEC 61131-2, Typ 1)
Input delay:	typ. 8 ms
Over voltage protection:	no
Terminals	2 plug-in screw terminal blocks, 10-pole, 5mm for wiring up to 2.5 mm <sup>2</sup>

#### 4.3.4 Digital outputs: X1, X2

Number of outputs:	8, electrically connected, source operation
Voltage range:	10...32 VDC, smoothed, max. 10% residual ripple
Output current:	5...500 mA (leakage current max. 0.1 mA) min. load resistance: 48 Ω
Short circuit protection	yes
Voltage drop:	Max. 0.3 V at 0.5 A
Output delay:	Typically 50 μs, max. 100 μs for resistive load
Terminals	2 plug-in screw terminal block 10-pole, 5 mm for wiring up to 2.5 mm <sup>2</sup>

#### 4.3.5 Relays outputs: X3, X4, X5

Number of outputs:	12, (8 NO, 4 change over)
Voltage range:	250VAC
Output current:	max. 4A AC1 (min > 100 mA, > 12 V)
Contact lifetime	1.5 x 10 <sup>5</sup> operations (4 A, 250 VAC AC1)
Relay coil supply:	nom. 24 VDC smoothed or pulsed, reverse voltage protected 20 °C: 21.5...32 VDC 30 °C: 21.9...32 VDC 40 °C: 22.3...32 VDC 50 °C: 22.8...32 VDC
Contact protection	no, must be made externally for inductive loads
Isolation distance	Contact – Contact: min. 3.0 mm Contact – low voltage zone: min. 6.0 mm Output – Output min. 6.0 mm
Terminals	3 plug-in screw terminal block 10-pole, 5 mm for wiring up to 2.5 mm <sup>2</sup>



**Please note that the state of the: Digital output and the Relays outputs are writable only.**

**It is not possible reading the state of the digital output or relays outputs.**

**Due to this fact, some instructions (like e.g. COM) do not work.**

**For more information read chapter 8.5 Digital Output**

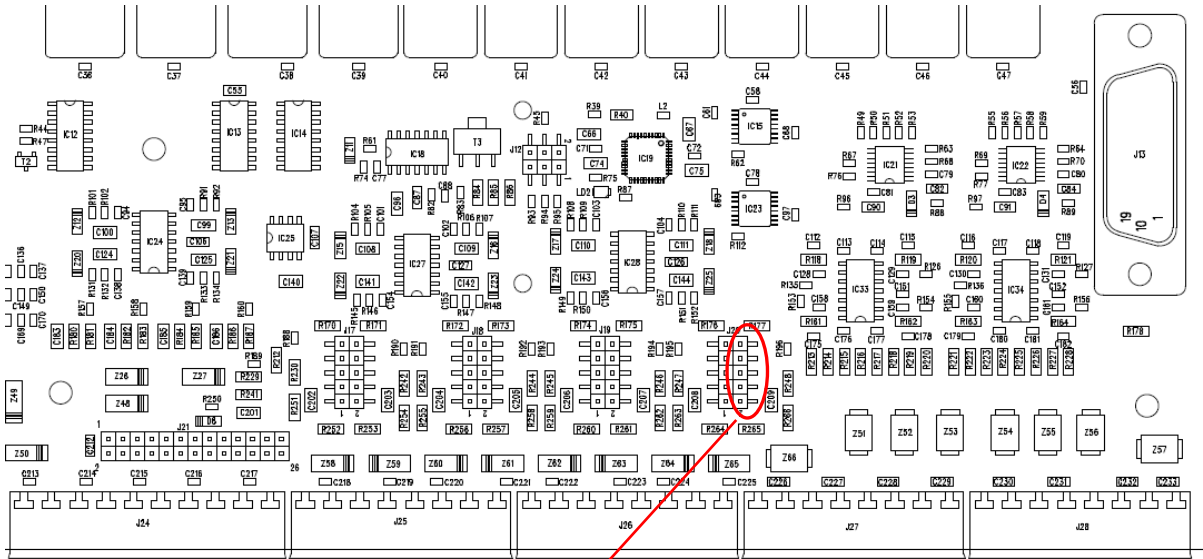
#### 4.3.6 Universal inputs Digital/Analogue: X10

Number of inputs:	5, (0 – 10 V usable as digital inputs 24 V)
Galvanic separation:	No
Signal ranges:	0...10 V (analogue) 20 k $\Omega$ 0...30 V (digital)
Resolution (digital representation):	12 bits
Connection technique for sensors	2-wires
Terminals	1 plug-in screw terminal block 10-pole, 3.5 mm for wiring up to 1.5 mm <sup>2</sup>

#### 4.3.7 Analogue inputs: X8, X9

Number of inputs:	8
Galvanic separation:	no
Signal ranges (jumper selectable):	0...10 V Resolution*) 2.44 mV 0...20 mA, Resolution*) 4.88 $\mu$ A
	*) Resolution = value of least significant bit (LSB)
Resolution (digital representation):	12 bits (0...4095) resp. directly in 1/10 °C
Connection technique for sensors	2 wires (passive input)
Measuring principle:	Single ended
Input resistance:	10 V range: 20 k $\Omega$ 20 mA range: 125 $\Omega$
Input filter:	typ. 10 ms (0...10 V; RTC10) typ. 20 ms (0...20 mA; PT/NI1000)
Input ranges for temperature sensors	PT1000: -100...+200° C NI1000: -50...+200° C NTC10: -50...+100° C
Accuracy at 25 °C:	$\pm$ 0.5%
Temperature error (0...+55 °C):	$\pm$ 0.25%
Over range protection:	10 V range: + 35 V (39 V TVS Diode) 20 mA range: +40 mA
Terminals	2 plug-in screw terminal blocks 8-pole, 3.5 mm for wiring up to 1.5 mm <sup>2</sup>

**For the Analogue Inputs, don't forget to put the jumper in right position  
(Voltage, Current or Temperature)**



There is no input protection  
in current mode  
(20 mA MAX!)

DEFAULT SETTING



Temperature (PT1000, ...)

Voltage

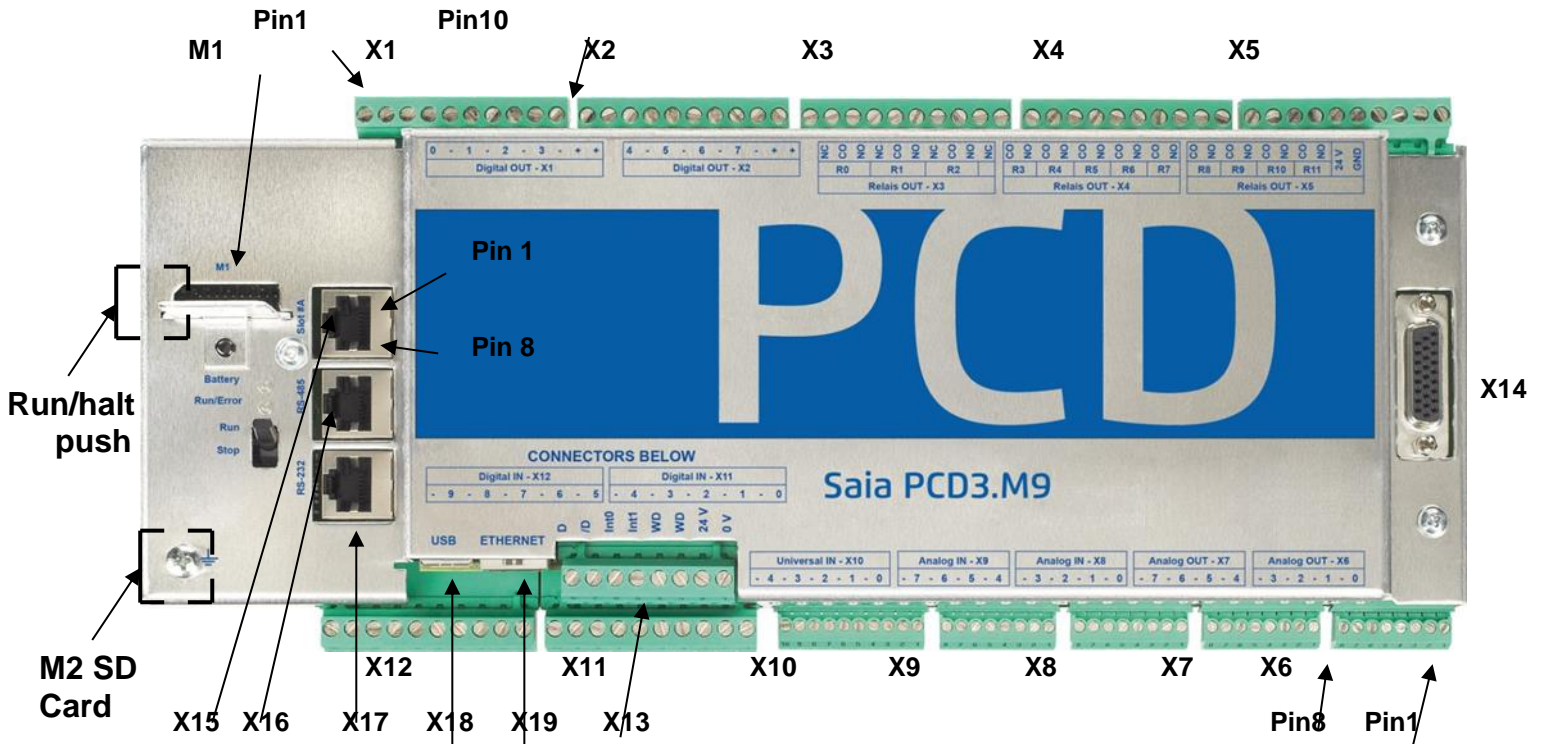
Current

#### 4.3.8 Analogue outputs: X6, X7

Number of outputs:	8
Galvanic separation:	no
Signal ranges:	0...10 V Resolution*) 2.44 mV
	*) Resolution = value of least significant bit (LSB)
Resolution (digital representation):	12 bits (0...4095)
Accuracy at 25 °C:	± 1% ± 50 mV
Temperature error (0...+55 °C):	± 0.25%
Load resistance	Voltage output 0...10 V: min. 3 kΩ
Short-circuit protection:	yes, permanent
Time constant of the output filter:	100 ms
Terminals	2 plug-in screw terminal blocks 8-pole, 3.5 mm for wiring up to 1.5 mm <sup>2</sup>

## 5 Connection technology

### 5.1 Numbering of connectors



### 5.2 Connector types

On CPU	
Power supply, RS-485, Watchdog and Interrupt Inputs (X13):	Plug-in screw terminal block, 8-pole <sup>1)</sup>
USB (X18):	Connector USB B TYPE
Communication Ethernet TCP/IP (X19):	RJ45

On I/O Board	
Digital outputs (X1;X2):	2x plug-in screw terminal block, 10-pole, 5 mm <sup>1)</sup>
Relais outputs (X3;X4;X5):	3x plug-in screw terminal block, 10-pole, 5 mm <sup>1)</sup>
Analogue outputs (X6 ;X7) :	2x plug-in screw terminal block, 8-pole, 3.5 mm <sup>2)</sup>
Analogue inputs (X8;X9):	2x plug-in screw terminal block, 8-pole, 3.5 mm <sup>2)</sup>
Universal Input (Analog/Digital) (X10):	1x plug-in screw terminal block, 10-pole, 3.5 mm <sup>2)</sup>
Digital inputs (X11;X12):	2x plug-in screw terminal block, 10-pole, 5 mm <sup>1)</sup>
	<sup>1)</sup> SAURO CIF green
	<sup>2)</sup> SAURO CTF green

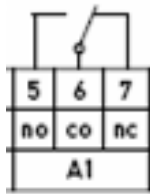
I/O Extension (X14):	HD 26-pole female
Optional Port1 (X15):	RJ-45
RS-485 Port 3 (X16):	RJ-45
RS-232 Port 0 (X17):	RJ-45

Pin out  
CPU



Connector	Pin number	Signal name	Description	Comment	
X13 CPU	1	GND	Power Supply		
	2	+24 V			
	3	WD	Watchdog		
	4	WD			
	5	Int1	2 interrupt inputs 24 VDC or 1 fast counter 24 VDC		
	6	Int0			
	7	/D	Port#2; RS-485		no termination (must be added externally if needed)
	8	D			

I/O-Board

Connector	Pin number	Signal name	Description	Comment
X1 Digital Outputs	1	D00	Digital Output 0	
	2	GND	System ground	
	3	DO1	Digital Output 1	
	4	GND	System ground	
	5	DO2	Digital Output 2	
	6	GND	System ground	
	7	DO3	Digital Output 3	
	8	GND	System ground	
	9	+24 V	System Power	
	10	+24 V	System Power	
X2 Digital Outputs	1	D04	Digital Output 4	
	2	GND	System ground	
	3	DO5	Digital Output 5	
	4	GND	System ground	
	5	DO6	Digital Output 6	
	6	GND	System ground	
	7	DO7	Digital Output 7	
	8	GND	System ground	
	9	+24 V	System Power	
	10	+24 V	System Power	
X3 Relais Outputs	1	R0 NC	Relais 0 NC	Example of contact relais:  
	2	R0 CO	Relais 0 common	
	3	R0 NO	Relais 0 NO	
	4	R1 NC	Relais 1 NC	
	5	R1 CO	Relais 1 common	
	6	R1 NO	Relais 1 NO	
	7	R2 NC	Relais 2 NC	
	8	R2 CO	Relais 2 common	
	9	R2 NO	Relais 2 NO	
	10	R3 NC	Relais 3 NC	

Connector	Pin number	Signal name	Description	Comment
<b>X4</b> Relais Outputs	1	R3 CO	Relais 3 common	
	2	R3 NO	Relais 3 NO	
	3	R4 CO	Relais 4 common	
	4	R4 NO	Relais 4 NO	
	5	R5 CO	Relais 5 common	
	6	R5 NO	Relais 5 NO	
	7	R6 CO	Relais 6 common	
	8	R6 NO	Relais 6 NO	
	9	R7 CO	Relais 7 common	
	10	R7 NO	Relais 7 NO	
<b>X5</b> Relais Outputs	1	R8 CO	Relais 8 common	
	2	R8 NO	Relais 8 NO	
	3	R9 CO	Relais 9 common	
	4	R9 NO	Relais 9 NO	
	5	R10 CO	Relais 10 common	
	6	R10 NO	Relais 10 NO	
	7	R11 CO	Relais 11 common	
	8	R11 NO	Relais 11 NO	
	9	+24 V	Relais Supply	24 V for all the relais coils
	10	GND	System ground	
<b>X6</b> Analog Outputs	1	AO0	Analog Output 0	
	2	GND	System ground	
	3	AO1	Analog Output 1	
	4	GND	System ground	
	5	AO2	Analog Output 2	
	6	GND	System ground	
	7	AO3	Analog Output 3	
	8	GND	System ground	
<b>X7</b> Analogue Outputs	1	AO4	Analog Output 4	
	2	GND	System ground	
	3	AO5	Analog Output 5	
	4	GND	System ground	
	5	AO6	Analog Output 6	
	6	GND	System ground	
	7	AO7	Analog Output 7	
	8	GND	System ground	
<b>X8</b> Analogue Inputs	1	AI0	Analog Input 0	
	2	AI GND	Analog Input ground	
	3	AI1	Analog Input 1	
	4	AI GND	Analog Input ground	
	5	AI2	Analog Input 2	
	6	AI GND	Analog Input ground	
	7	AI3	Analog Input 3	
	8	AI GND	Analog Input ground	
<b>X9</b> Analogue Inputs	1	AI4	Analog Input 4	
	2	AI GND	Analog Input ground	
	3	AI5	Analog Input 5	
	4	AI GND	Analog Input ground	
	5	AI6	Analog Input 6	
	6	AI GND	Analog Input ground	
	7	AI7	Analog Input 7	
	8	AI GND	Analog Input ground	
<b>X10</b> Universal Inputs	1	UI0	Universal Input 0	
	2	GND	System ground	
	3	UI1	Universal Input 1	
	4	GND	System ground	
	5	UI2	Universal Input 2	
	6	GND	System ground	
	7	UI3	Universal Input 3	
	8	GND	System ground	
	9	UI4	Universal Input 4	
	10	GND	System ground	

Connector	Pin number	Signal name	Description	Comment
<b>X11</b> Digital Inputs	1	DI0	Digital Input 0	
	2	GND	System ground	
	3	DI1	Digital Input 1	
	4	GND	System ground	
	5	DI2	Digital Input 2	
	6	GND	System ground	
	7	DI3	Digital Input 3	
	8	GND	System ground	
	9	DI4	Digital Input 4	
	10	GND	System ground	
<b>X12</b> Digital Inputs	1	DI5	Digital Input 5	
	2	GND	System ground	
	3	DI6	Digital Input 6	
	4	GND	System ground	
	5	DI7	Digital Input 7	
	6	GND	System ground	
	7	DI8	Digital Input 8	
	8	GND	System ground	
	9	DI9	Digital Input 9	
	10	GND	System ground	



**Analog Input:**

If the GND of the sensors are already collected externally, it is recommended to connect at least one GND of the sensors per terminal block of the controller.

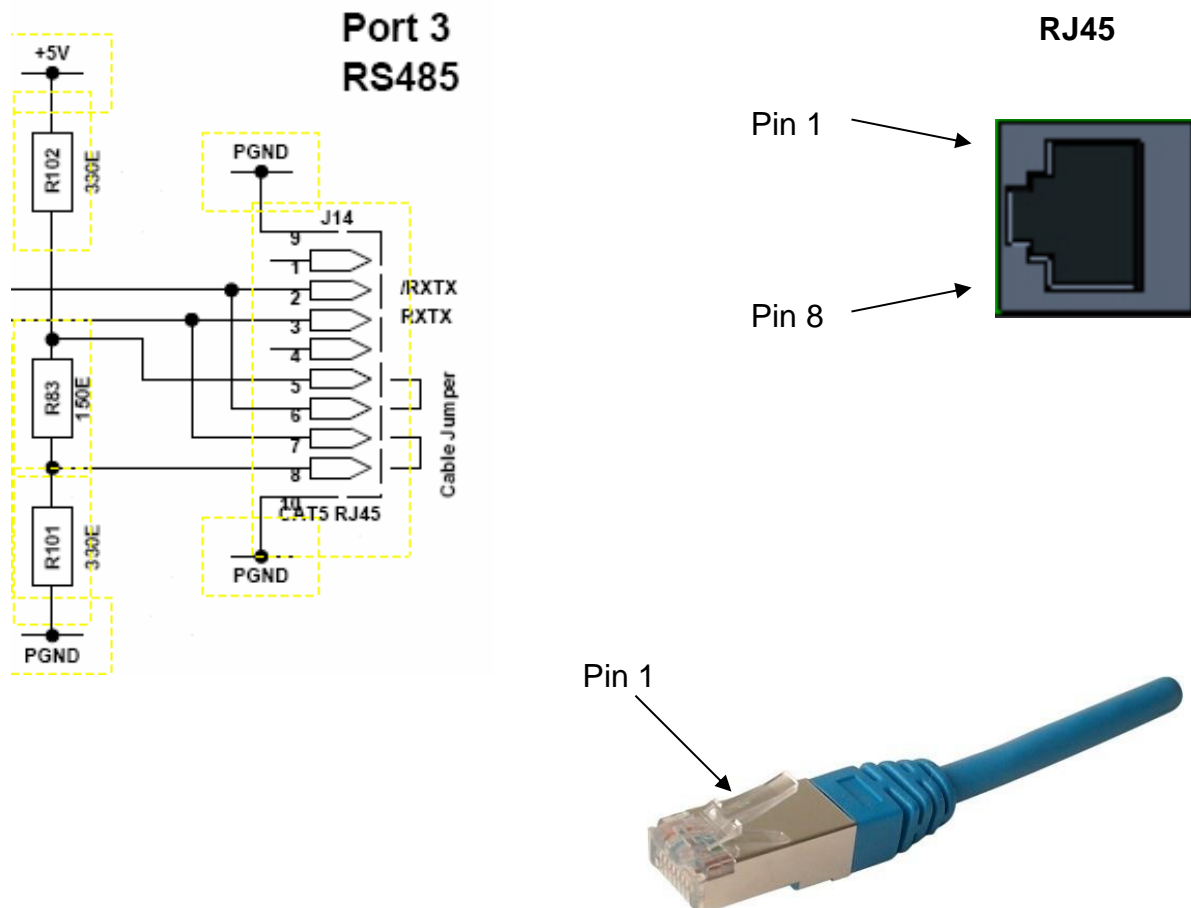


## Interfaces:

X15 Optional Port1		PCD7.F121S (RS-232)	PCD7.F110S (RS-422)	PCD7.F150S (RS-485)	PCD7.F180S (MP-Bus)
	1	DCD	/CTS		
	2	RXD	/TXD	/RX-/TX	MST_PG
	3	TXD	TXD	RX-TX	COM
	4	DTR	RTS		
	5	GND	GND		GND
	6	DSR	/RTS		
	7	RTS	RXD		MST_DET
	8	CTS	/RXD		
	Housing	PGND (shield)	PGND (shield)	PGND (shield)	PGND (shield)

X16 RS-485 Port 3		If you use Profi-S-Net the port will switch to Port 10
	1	
	2	/RX-/TX
	3	RX-TX
	4	
	5	Termination resistor up* (on: bridge to pin 6)
	6	/RX-/TX
	7	RX-TX
	8	Termination resistor down* (on: bridge to pin 7)
	Housing	PGND (shield)

### \* Termination Resistor



<b>X17 RS-232 Port 0</b>		
	1	DCD
	2	RXD
	3	TXD
	4	DTR
	5	GND
	6	DSR
	7	RTS
	8	CTS
	Housing	PGND (shield)

## 6 I/O Mapping

Function	Address	Configuration
Slot 0...3	0 ...63	not usable (on CPU slot 0...3)
8 DO	64...79	like PCD3.A460 configured
12 Relays O	80...95	like PCD3.A200 configured but 12 relays
8 AO / 8AI / 5UI	96...111	new to implement
10 DI	112...127	like PCD3.E160 configured
I/O Extension	256...319	

The Extension Connector has the standard PCD3 pinning, so a standard extension PCD3.Cxx can also be used. The addresses higher than 319 are not supported.



Do never plug in the extension if the main module has power source.  
To connect an extension the main module must be disconnected from the power supply.

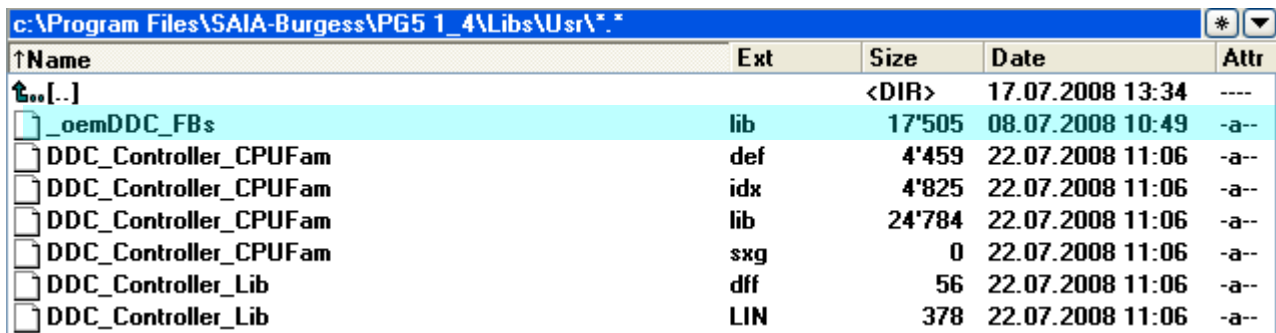
## 7 Configuration

### 7.1 Software

All of us customer will receive per E-mail, one file (the name is DDC\_Controller\_Lib\$.exe) to install in his own PC to be able to configure some Inputs and Outputs (see a picture in the next side).

To use the new Fbox in PG5, **double-click on the EXE.file:**

All files will be installed automatically in the right dossier (see image here below).



Name	Ext	Size	Date	Attr
↑Name				
↑..[...]		<DIR>	17.07.2008 13:34	----
<input type="checkbox"/> _oemDDC_FBs	lib	17'505	08.07.2008 10:49	-a-
<input type="checkbox"/> DDC_Controller_CPUFam	def	4'459	22.07.2008 11:06	-a-
<input type="checkbox"/> DDC_Controller_CPUFam	idx	4'825	22.07.2008 11:06	-a-
<input type="checkbox"/> DDC_Controller_CPUFam	lib	24'784	22.07.2008 11:06	-a-
<input type="checkbox"/> DDC_Controller_CPUFam	sxg	0	22.07.2008 11:06	-a-
<input type="checkbox"/> DDC_Controller_Lib	dff	56	22.07.2008 11:06	-a-
<input type="checkbox"/> DDC_Controller_Lib	LIN	378	22.07.2008 11:06	-a-

Note: Just the file **\_oemDDC\_FBs** is used with the IL program.

## 7.2 Hardware settings

The OEM M9 Controller is based on a PCD3.M5 CPU board.

### 7.2.1 PG5 2.x

If you create a new Project in PG5 2.x you have to choose the PCD type PCD3.M96.

Device	
Type	Description
PCD3.M96	CPU with 2 MBytes code/text/DB flash memory and 1 MBytes extension memory (RAM for Text/DB from address 4000), USB, F

Monitoring	
Section	Description
Monitoring	Monitoring and logging of meter data. Automatic scanning of S-Bus meters and gateways.

Onboard Communications	
Type	Description
USB	Universal Serial Bus port, PGU or general-purpose.
RS-485	RS-485 port for general-purpose communications (Terminal block).
Ethernet	Ethernet port. IP Settings, DHCP.

Ethernet Protocols	
Section	Description
IP Transfer Protocols	FTP, HTTP Direct Protocols, ODM.
IP Protocols	DNS, SNTP, SNMP protocols.
HTTP Portal	HTTP Portal Communication For PCD Over Private Network.

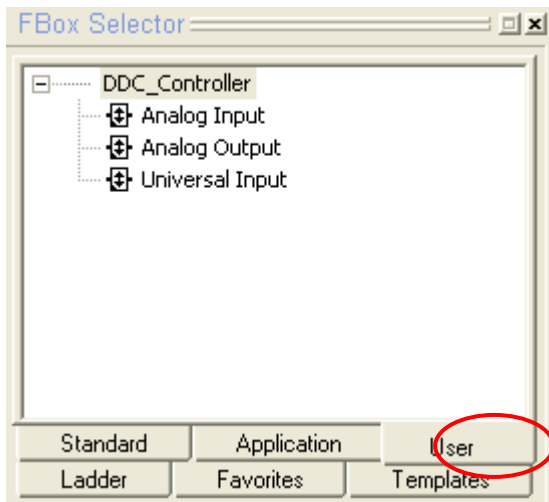
Onboard Inputs/Outputs		
I/O	Type	Description
I/O 0	2 Digital Inputs	2 digital inputs - interrupts Int0/Int1 (Terminalblock).

Properties	
Device : PCD3.M96	
<b>Firmware</b>	
Firmware Version	From 1.28.00 or mo
<b>Memory</b>	
User Code/Text/C	2 MBytes ROM
Extension Text/DE	1 MBytes RAM
User Code/Text/C	On File System
User File System	128 MBytes
Program Director	Onboard Flash
<b>Options</b>	
Reset Output Ena	No
XOB 1 Enabled	No
Run/Stop Switch E	Yes
Time Zone Code	CET+01,CEST+02,M
Service Key	
<b>Password</b>	
Password Enable	No
Password	
Inactivity Timeout	1
<b>S-Bus</b>	
S-Bus Support	Yes
S-Bus Station Nur	43
<b>Input/Output Handling</b>	
Input/Output Han	Yes
Peripheral Address	Auto (recommended)
<b>Power Supply</b>	
Power Supply Spe	-25/+30%
Current Available	600
Current Available	100

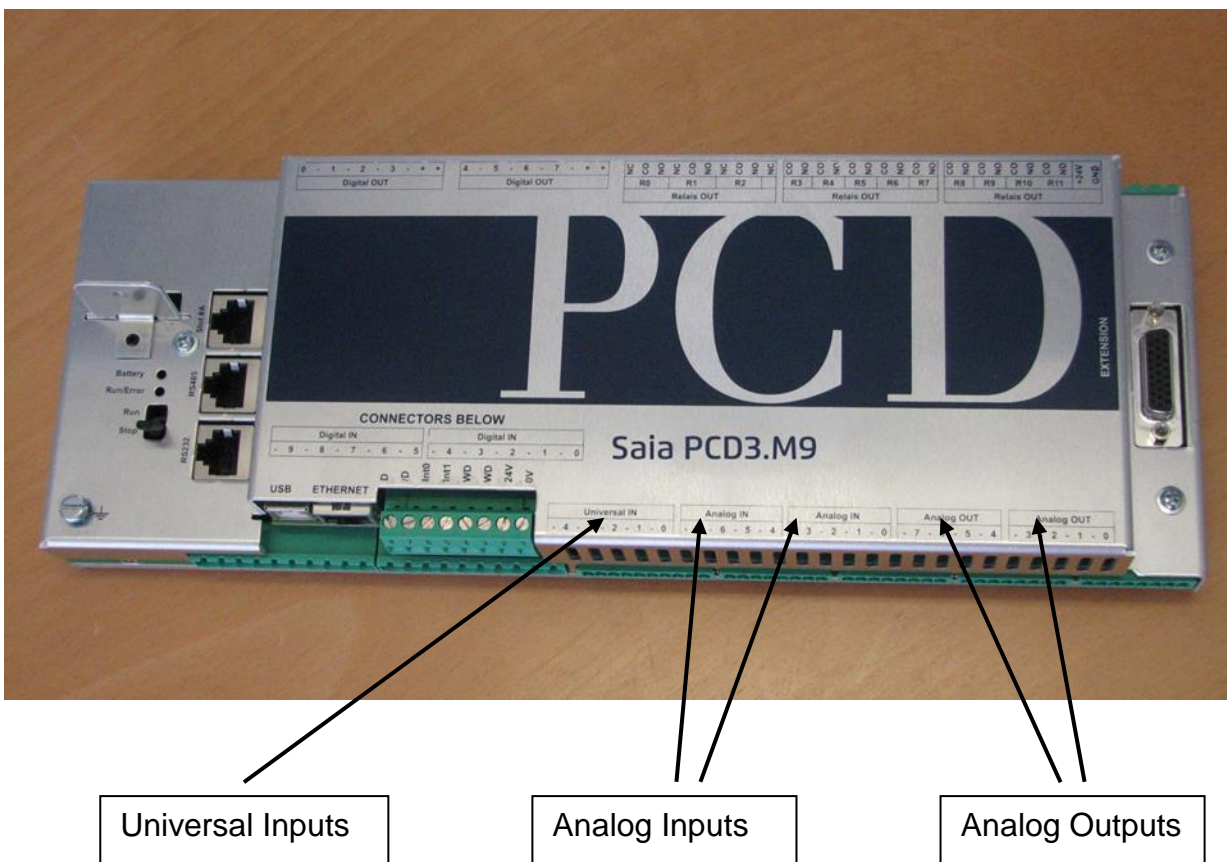
## 8 FBox

You can find the special FBox for the DDC\_Controller in *FBox Selector* "User"

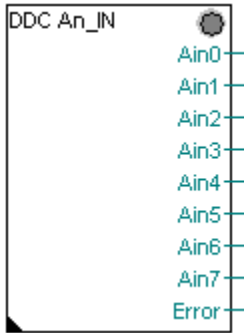


Remark: All of these 3 FBox can be stretched up to their own maximal inputs/outputs.

Below a picture of the DDC Controller with the 3 different Input/Output, which are used in the new FBox.



## 8.1 Analog Input



There are 8 maximal inputs, which can have independently 7 different **Mode Selection**. There is no filter of 50/60Hz in **Fast Mode**.

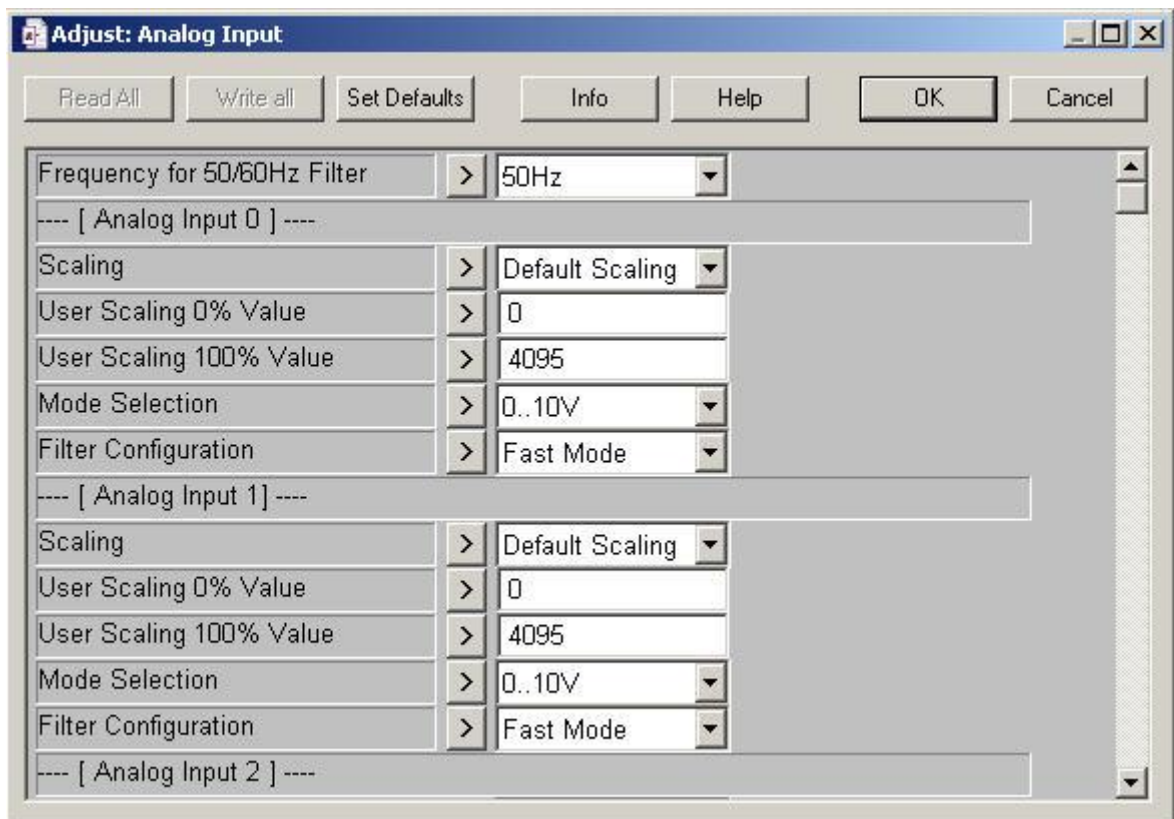
An **error** appears when we swapped the User Scaling Min and Max or if the value is not inside the range in Temperature mode.

If there is no communication with the ADuC, it will give an error too.

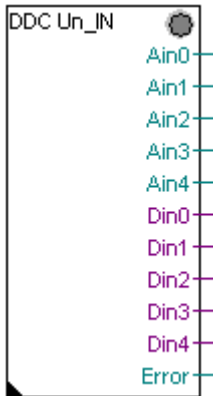
To have more information about this FBox, you can take the Fbox of a **W.525** and read his help (it's almost the same configuration)

Differences:

- There is a different amount of I/Os available. As result, the bits in the error register do have a different order (see point 7.4).
- There are different ranges for the temperature measurements.
- A Pt500 sensor can be used on a PCD3.W525, on a PCD3.M9 it is a NTC10 instead.
- The hardware input filters are not identical.



## 8.2 Universal Input

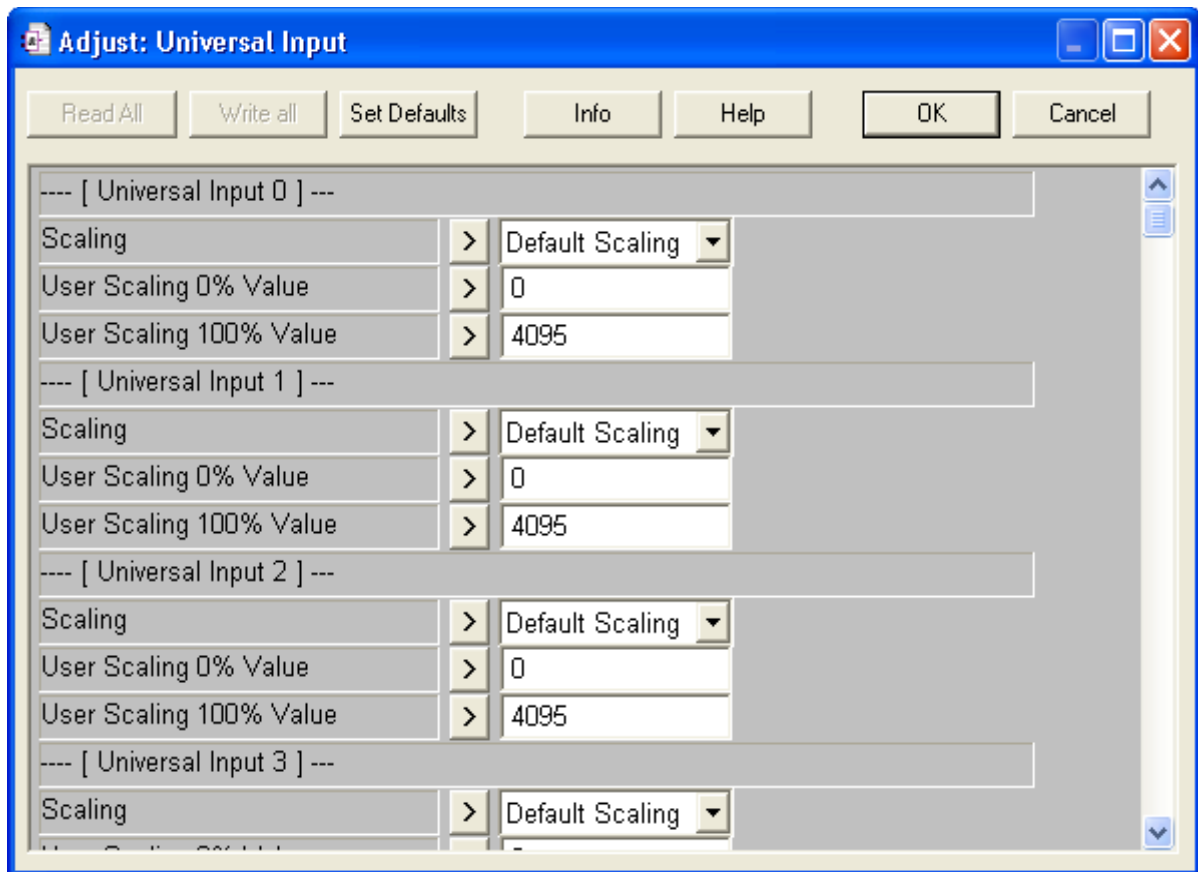


There are 5 maximal inputs, which can have just 1 mode (0 to 4095 in **Default Scaling**)

The digital input is high when the input voltage is upper than 10 V!

An **error** appears when we swapped the User Scaling Min and Max.

If there is no communication with the ADuC, it will give an error too.



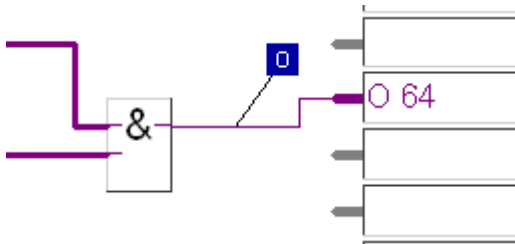




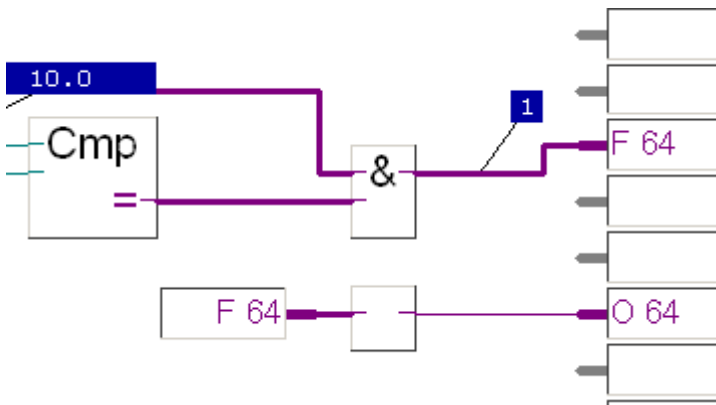
## 8.5 Digital Output

**Digital output and the Relays outputs are writable only.  
Due to this fact, some instructions (like e.g. COM) do not work.**

In Fubla the digital outputs are always indicated as low (also if the outputs are switched on and the tension can be measured at the output).



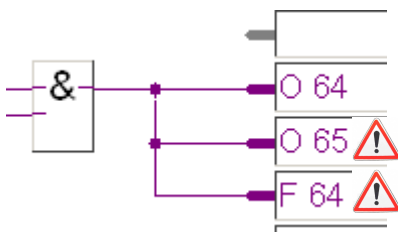
If you re-use the state of a digital output in your project you can write the state to a flag (and at the end of the program cycle this flag can copied to the output).



### Important note

If the digital outputs are connected to other outputs and flags directly (like in the screenshot below), only the first output will be written correctly (the subsequent connectors will be low (0)). The reason is that state of the first output connector is copied to the second output connector and so on.

In the example below Output 65 and Flag 64 will never get high.



## 9 EMC standards

Referenced on IEC61131-2:2003 needs including EN61000-6-4:2001 industrial level

### 9.1 Immunity Testing

#### 9.1.1 Immunity to Electrostatic Discharge (ESD) → IEC 61000-4-2

Air discharge: +/- 8 kV  
 Contact discharge: (HVR) +/- 6 kV

#### 9.1.2 Immunity to Fast Transient (Burst) → IEC 61000-4-4

Refer to IEC61131-2:2003 Table 31

Test description	Asked	Remarks & References
<i>Direct coupled: Power Supply 24 VDC</i> ➤ On + terminal ➤ On - terminal	±2 kV ±2 kV	
<i>Capacitive coupled: inputs/outputs</i> ➤ Onboard ➤ Modular inserted	±1 kV	
<i>Capacitive coupled: communication ports</i>	±0.5 kV	

#### 9.1.3 Immunity to High Energy Surge (1,2/50 μs) → IEC 61000-4-5

Refer to IEC61131-2:2003 Table 31 & 40

Test description	Asked	Remarks & References
<i>Power supply DC : Common Mode</i> ➤ Coupling : 12Ω / 9μF direct, 5 pos, 5 neg, 1/min ➤ UUT powered on ➤ Surge on +Terminal vs. PGND ➤ Surge on -Terminal vs. PGND	± 1 kV ± 1 kV	
<i>I/O &amp; Comm lines shielded: Common Mode</i> ➤ Coupling: 42Ω / 0.5μF direct, 5 pos, 5 neg, 1/min ➤ UUT powered on	± 1 kV	
<i>I/O &amp; Comm lines unshielded: Differential Mode</i> ➤ Coupling: 42 Ω / 0.5 μF direct, 5 pos, 5 neg, 1/min ➤ UUT powered on	± 0.5 kV	

#### 9.1.4 Immunity to Conducted Radio Frequency (RF) Interferences → IEC 61000-4-6

Test description	Asked	Remarks & References
<ul style="list-style-type: none"> <li>➤ 0.15...80 MHz; AM 1 kHz, 80%</li> <li>➤ Tested ports:                             <ul style="list-style-type: none"> <li>- Supply 24 VDC</li> <li>- I/O &amp; Comm lines</li> <li>- Functional earth</li> </ul> </li> </ul>	3 Vrms	covering IEC61131-2:2003 Table 31 & 41

#### 9.1.5 Immunity to Radiated Electromagnetic Fields → IEC 61000-4-3

Test description	Asked	Remarks & References
<ul style="list-style-type: none"> <li>➤ 80...1000 MHz</li> <li>➤ 1kHz, AM 80%</li> <li>➤ Vertical and horizontal polarization</li> </ul>	10 V/m	covering and exceeds IEC61131-2:2003 Table 30 & 37

### 9.2 Emission Testing

#### 9.2.1 Radiated Emission 30...1000 MHz

Test description	Remarks & References
<ul style="list-style-type: none"> <li>➤ 30..230 MHz; 40 dB quasi-peak</li> <li>➤ 230 ...1000 MHz; 47 dB quasi-peak</li> <li>➤ basic standard CISPR 11</li> <li>➤ 10m</li> </ul>	industrial level

## 10 Mechanical robustness

### 10.1 Vibrations

Reference Test	IEC 68-2-6, Test Fc
Motion	Sinusoidal
Amplitude/Acceleration	
5...9 Hz	3.5 mm
9...150 Hz	1.0 g
Vibration type	Sweeping, at a rate of 1oct./min (+/-10%)
Vibration duration	10 sweep cycles per axis on each of three mutually perpendicular axes

### 10.2 Shocks

Reference Test	IEC 68-2-27, Test Ea
Type of Shock	Half-Sine
Shock severity	15 g peak
Shock duration	11 ms
Application	2 Shocks per axis on each of three mutually perpendicular axes

#### Notes:

- Electromechanical relays may temporarily respond to 15 g shocks. Temporarily malfunction is allowed during the test, but equipment must be fully functional after the test.

## 11 Additional Documents

### 11.1 RS-232 PCD7K913.pdf (H4 421 5491 0)

<b>DSUB RS-232 cable – RJ-45</b>	<b>PCD7.K013</b>
Connector: 9 pin DSUB. male – RJ-45 8 pin.	
Cable length = 2.5 m, cable gray shielded Cat5e (about 0.14 mm <sup>2</sup> AWG 26)	