

ProSys-5102

Box PC with Intel® Haswell i5-4300U

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Introduction

Symbols used in this Manual



This symbol point out to especially information.

Important Instructions

This chapter contains instructions which must be observed when using your Flatman Monitor.
The manufacturer's instructions provide useful information on your device.

Note on the Warranty

Due to their limited service life, parts which by their nature are subject to a particularly high degree of wear (wearing parts) are excluded from the warranty beyond that provided by law. This applies to the CMOS battery, for example.

Technical Short Information

Housing

RAL 7021 powder coated
(WxDxH) 180 x 134 x 68mm (Heatsink included)
Weight: 1300g

Integrated SBC

CPU Intel® Haswell ULT i5-4300U (*option: w/ i7-4650*)
4GB RAM (*option up to 8GB*)
Storage: 64GB mSATA SSD (*option: up to 7GB*)

Hardware Monitor

Voltages, Temperature

EMC

EN55022 class B

Interfaces

4x USB3.0
3x GbE LAN
2x Display Port
2x COM (RS232, RS422, RS485, BIOS configurable)

Power

16-30V_{DC} Input via Phoenix Connector PSC 1,5/ 3-F

OS Support

Windows7, Windows8, Linux

Environment

Fanless passive cooling
Operating temp.: 0 °-50°C ambient
Humidity: 10%-90% @ 39°C, non condensing

Power Consumption

	U _{IN}	I _{IN}	P _{IN}
Standby	24 V	0,020 A	0,5 W
Windows IDLE	24 V	0,308 A	7,4 W
Windows typical workload (BurnIn with max. load)	24 V	0,800 A	19,2 W
Windows with CPU at TDP (Thermal Design Power selected in Thermal-analysis-tool)	24 V	0,990 A	23,8 W
Windows with max. workload & max. Graphics adjusted in Thermal-analysis-tool & turbo mode (max. current consumption)	24 V	1,440 A	34,6 W

Test Setup: Windows 7 pro. 64bit; 4GB RAM ; 60GB mSATA

Order Information

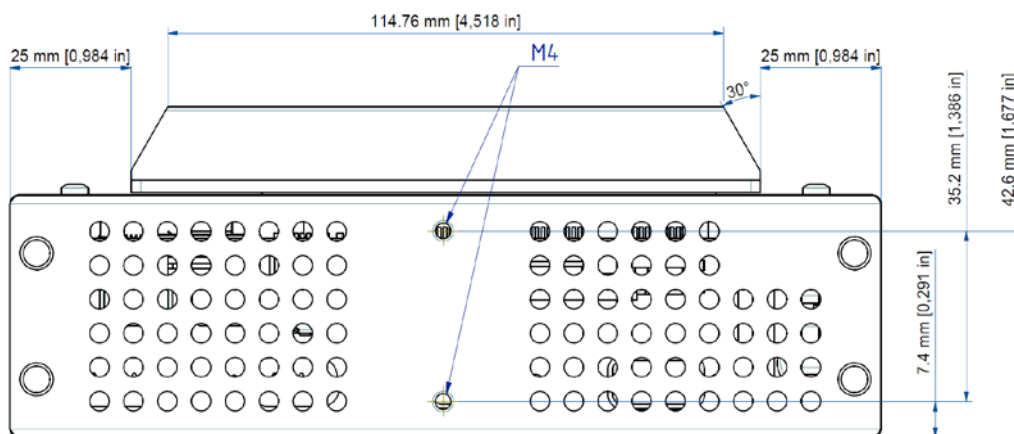
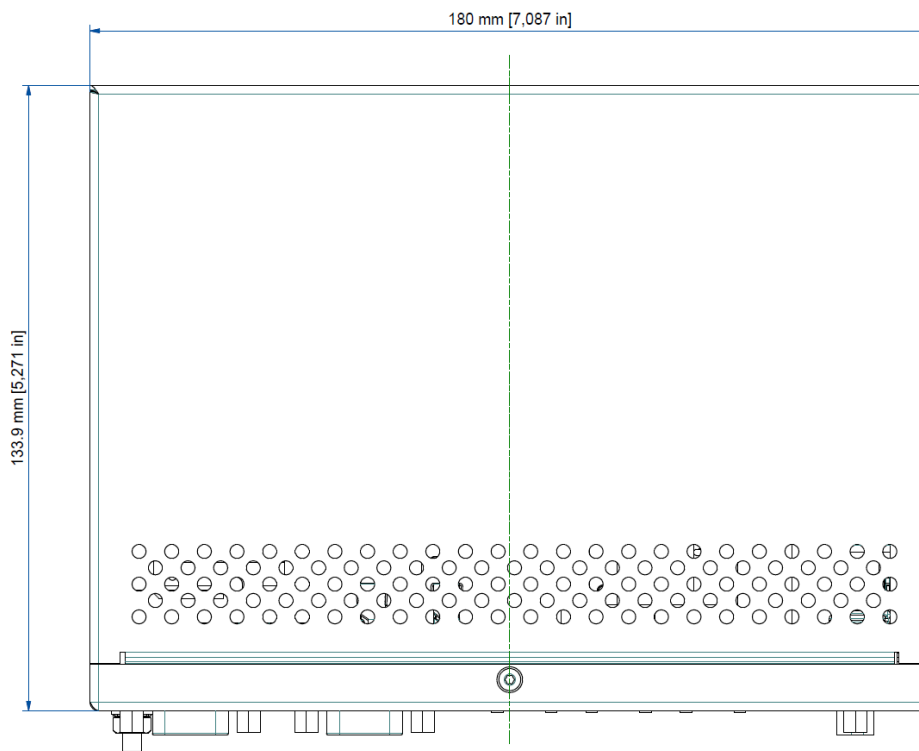
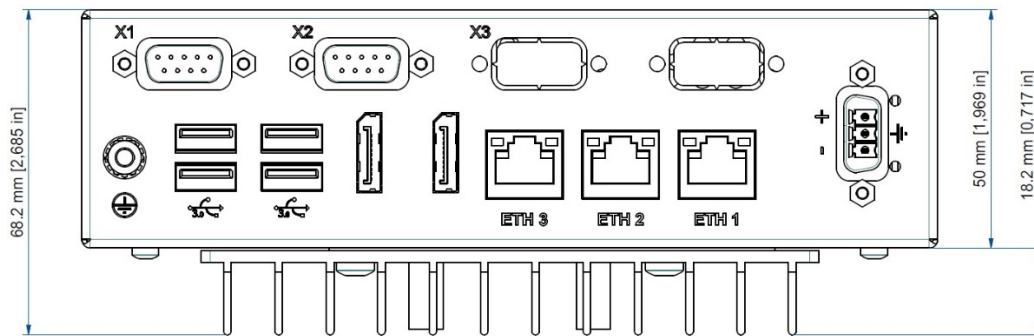
Order#	Description
EN00-004001-01	RAIL-PC-5101; Intel Haswell i5-4300U, 4GB RAM, 64GB mSATA
EN00-004002-01	RAIL-PC-5101; Intel Haswell i5-4300U, 8GB RAM, 128GB mSATA
EN00-004003-01	RAIL-PC-5101; Intel Haswell i5-4300U, 8GB RAM, 256GB mSATA
EN00-004004-01	RAIL-PC-5101; Intel Haswell i5-4300U, 4GB RAM, 32GB mSATA
EN00-004005-01	RAIL-PC-5101; Intel Haswell i5-4300U, 4GB RAM, 128GB mSATA

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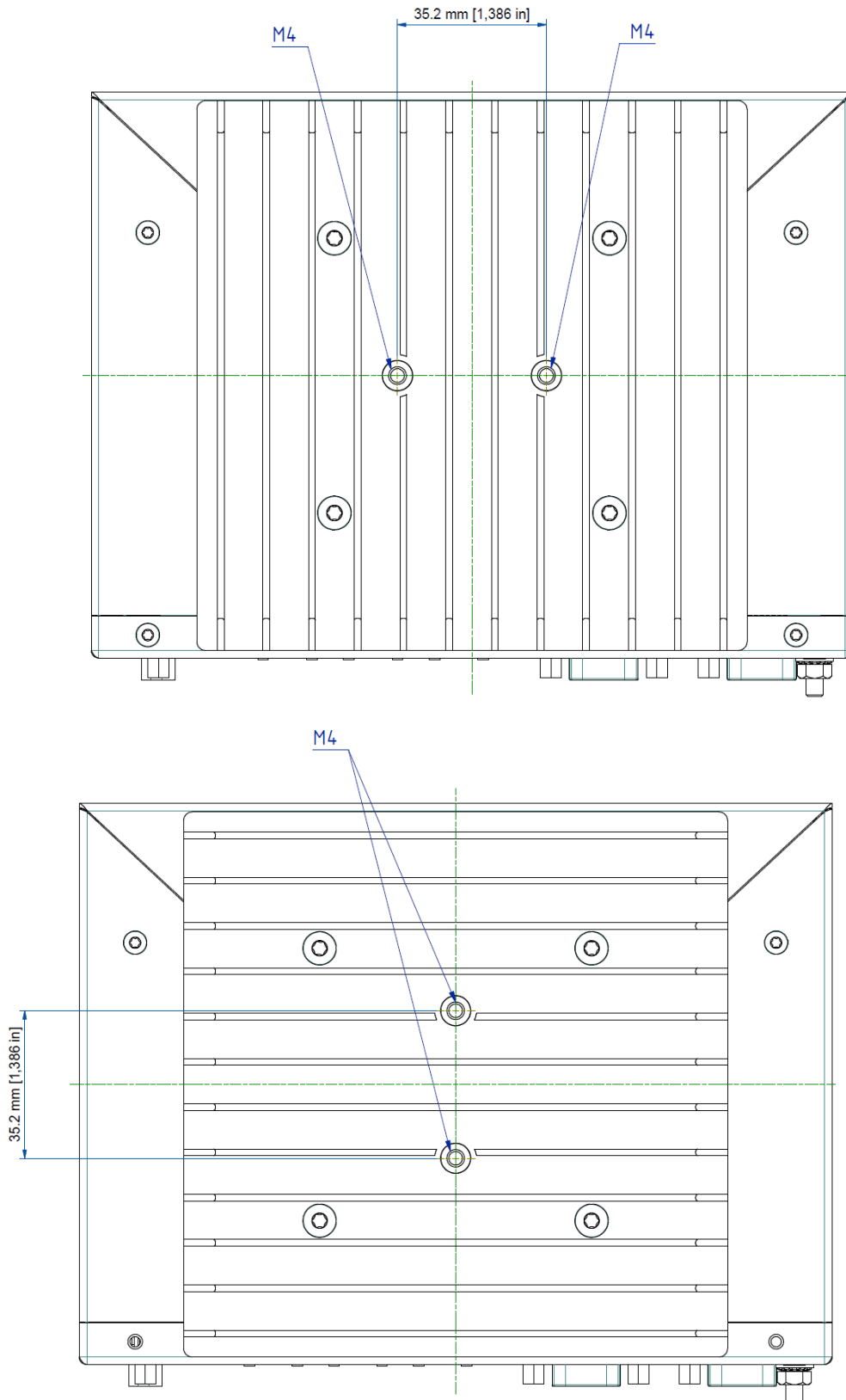
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Dimensions



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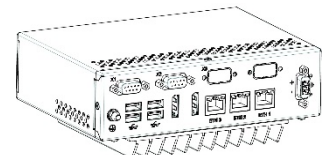
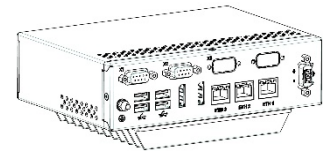
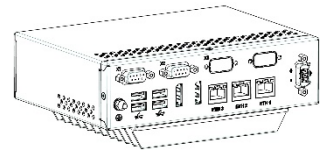


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Mounting options

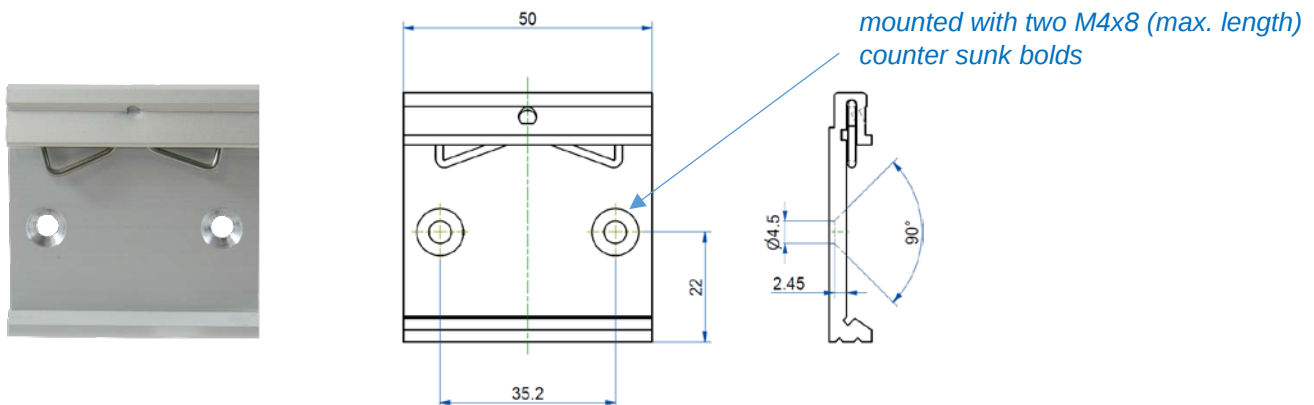


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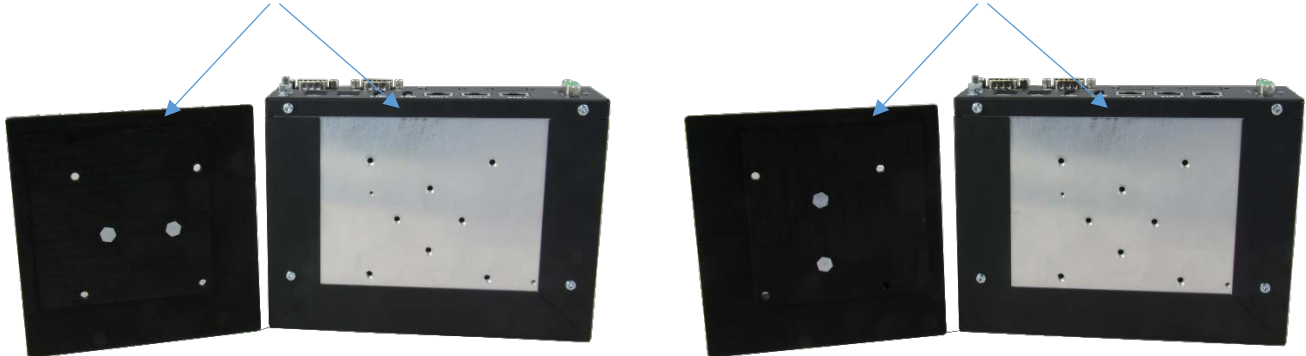


Always make sure to mount the DIN rail retaining clamp in upper position



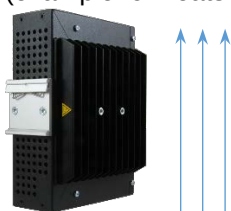
The heatsink is flippable according to the Rail PC mounting. Make sure that the airflow always works in upright direction.

The small milling boundary of the heatsink has to be mounted to the small rim of the Box housing



Important note: For operating mode has to be inserted a thermal grease between heatsink and mounting plate

(example for heatsink mounting and airflow:)



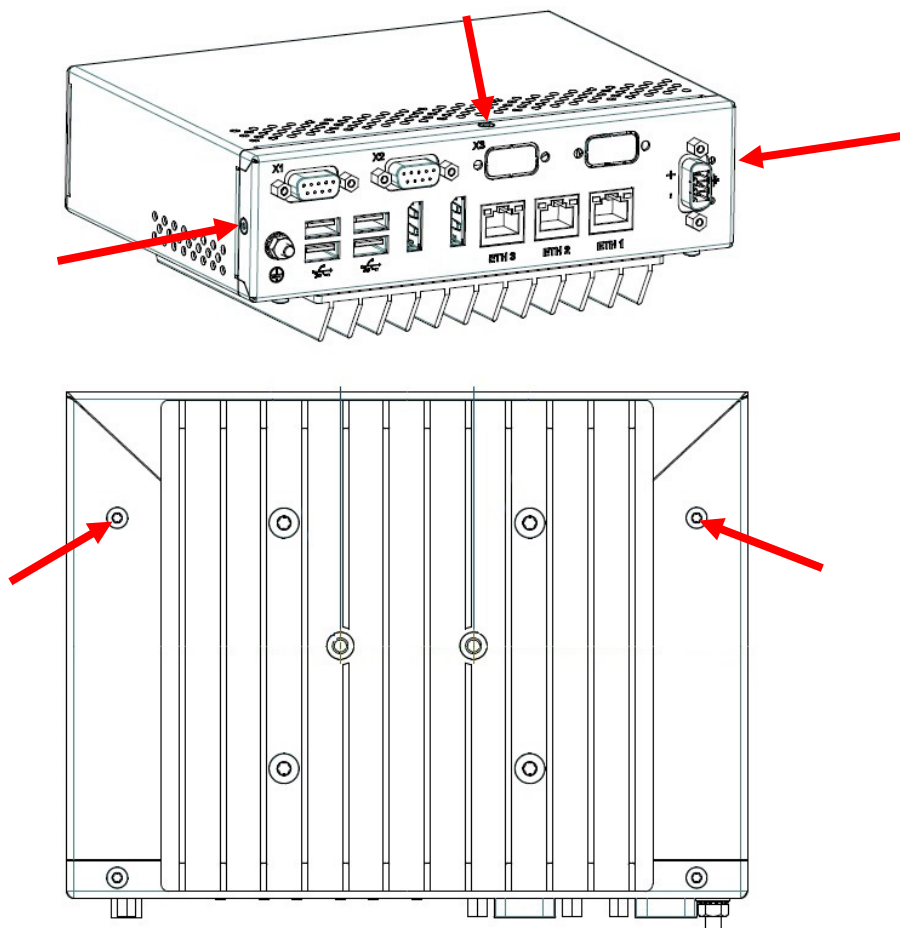
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Open the housing

To open the housing just remove five screws:



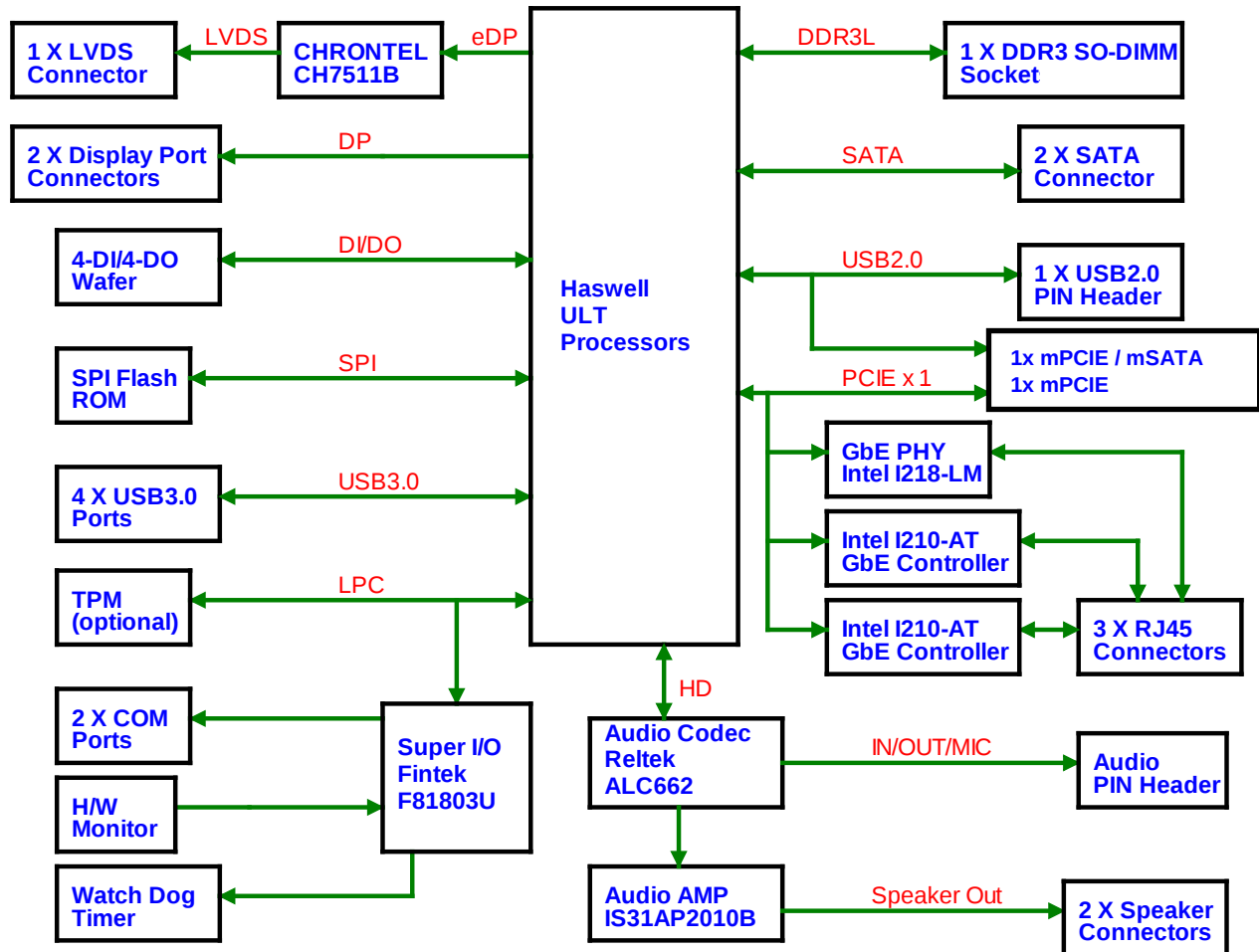
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CPU inside

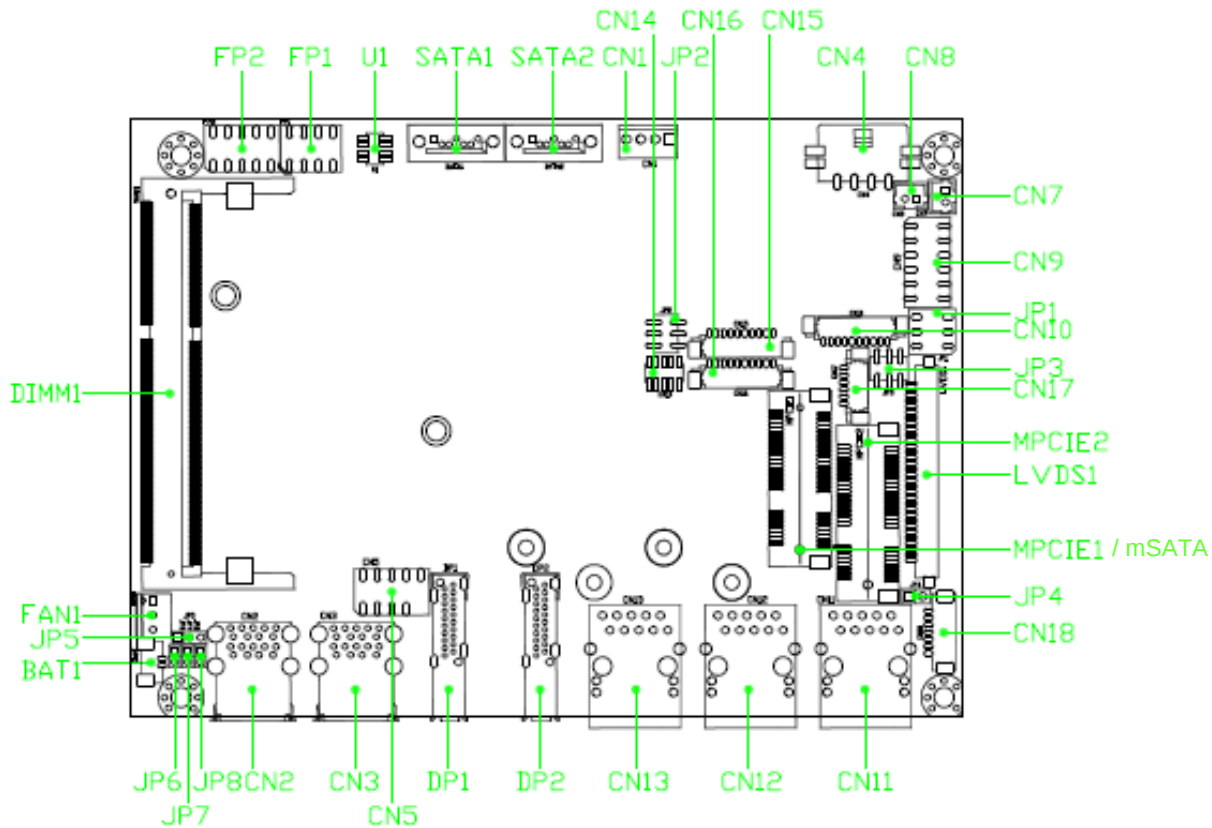
Block Diagram



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Top View:



Internal Connector List:

Label	Function
BAT1	Battery Power Input Wafer
BZ1	Onboard Buzzer
CN1	SATA HDD Power Output Wafer
CN5	USB2.0 Port 4, 5 Pin Header
CN7	Right Channel 3W Audio AMP Output Wafer
CN8	Left Channel 3W Audio AMP Output Wafer
CN9	Audio Pin Header
CN10	Digital Input / Output Pin Header
CN14	P80_Header LPC
CN15	RS-232 / 422 / 485 Port 1 Wafer
CN16	RS-232 / 422 / 485 Port 2 Wafer
CN17	SIM Interface Wafer for MPCIE2
CN18	Backlight Power Output Wafer for LVDS1
DIMM1	DDR3 Memory SO-DIMM Socket
FAN1	CPU FAN Wafer
FP1	Front Panel 1 Pin Header
FP2	Front Panel 2 Pin Header
LVDS1	Primary 24-bit, 2-channel LVDS Panel Connector
mPCIE1	Mini-PCIE Express v1.2 Socket / mSATA
mPCIE2	Mini-PCIE Express v1.2 Socket
SATA1	Serial ATA Port 0 Connector
SATA2	Serial ATA Port 1 Connector

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Panel Connector List:

Label	Function
CN2	USB3.0 Port 0,1 Connector
CN3	USB3.0 Port 2,3 Connector
CN11	GbE LAN1 RJ-45 Connector
CN12	GbE LAN2 RJ-45 Connector
CN13	GbE LAN3 RJ-45 Connector
DP1	DP Connector
DP2	DP Connector (Dual Mode)
X1	COM1
X2	COM2
PWR	Input Power Connector (3pin Phoenix)

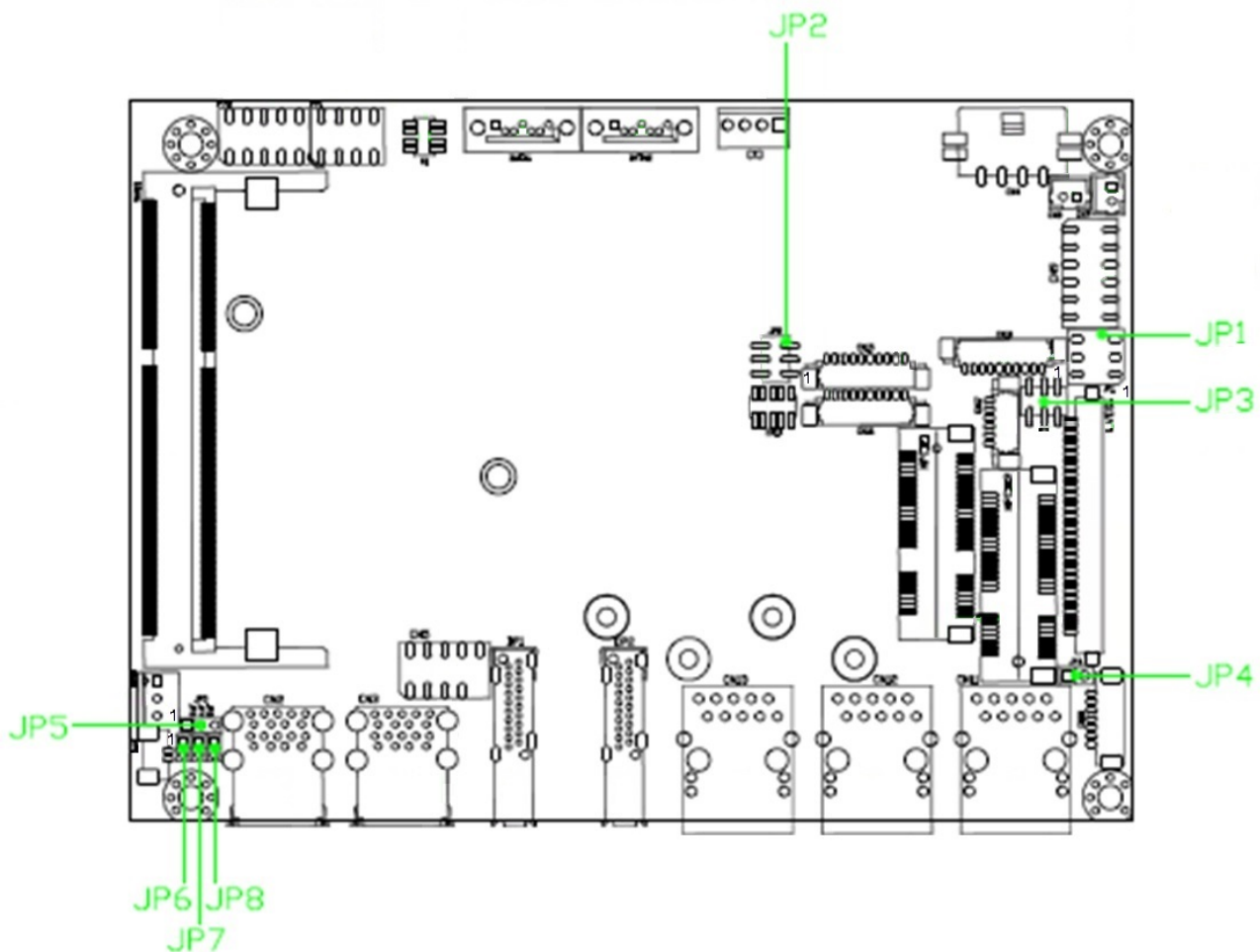
Jumper List:

Label	Function
JP1	Panel & Backlight Power Selection for LVDS1
JP2	AT_ATX Mode / MPCIE1 mSATA / mPCIE Selection
JP3	Backlight Power Enable Selection for LVDS1
JP4	MPCIE Activity LED Indication
JP5	USB POWER Selection
JP6	Flash Description Security Over-ride
JP7	RTC Reset Selection
JP8	SRTC Reset Selection

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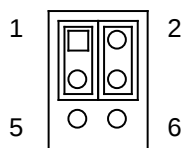
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Jumper Settings



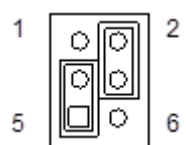
JP1: Panel & Backlight Power Selection for LVDS1 (Pitch 2.54mm)

(not used for Rail-PC-System !!)



Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V

JP2: AT_ATX Mode / MPCIE1 mSATA / mPCIE Selection (Pitch 2.54mm)



Jumper	Setting	Status
1	1-3	ATX Mode
	3-5	AT Mode (Default)
2	2-4	mPCIE1 mSATA Selected (Default)
	4-6	mPCIE1 mPCIE Selected

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Important note:

There is no „power-on-button“ on the device available:

Therefore the jumper **JP2** (AT/ATX Mode) has always set to „**AT-Mode**“!

According to this the **BIOS setting** for Power Mode is „**Power Off**“!

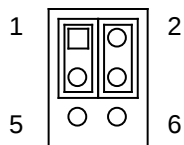
(Default settings ex factory)

BIOS Power Setting

Control Group Structure Name	BIOS Defaults	Possible Setting
ACPI Sleep State	S3 (Suspend to Ram)	Suspend Disabled - S3 (Suspend to Ram)
Restore AC Power LOSS	Power OFF	Power Off - Power On - Last State
Power Saving Mode	Disabled	Disabled - Enabled
Resume Event Control		
Resume from S3 By PS/2 Keyboard	Disabled	Disabled - Enabled
Resume from S3 By PS/2 Mouse	Disabled	Disabled - Enabled
Resume By PCIE Device	Disabled	Disabled - Enabled
Resume By RingRTC Alarm	Disabled	Disabled - Enabled
Resume By RTC Alarm	Disabled	Disabled - Enabled
▶ WatchDog Timer Configuration		

JP3: Backlight Power Enable Selection for LVDS1 (Pitch 2.00mm)

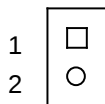
(not used for Rail-PC-System !!)



Jumper	Setting	Status
1	1-3	Backlight <i>Enable</i> Voltage = +3.3V
	3-5	Backlight <i>Enable</i> Voltage = +5V
2	2-4	Active High
	4-6	Active Low

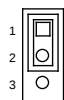
JP4: mPCIE Activity LED Indication (Pitch 2.54mm)

(not used for Rail-PC-System !!)



Pin	Description
1	LED+
2	LED-

JP5: USB Power Selection (Pitch 2.00mm)

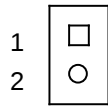


Jumper	Status
1-2 Short	USB power will be cut off in S4 & S5 state.
2-3 Short	USB power will be cut off in Deep S5 state.

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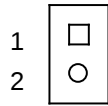
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JP6: Flash Description Security Over-ride (Pitch 2.54mm)



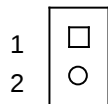
Jumper	Status
1-2 Open	Disabled
1-2 Short	Enabled

JP7: RTC Reset Selection (Pitch 2.54mm)



Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear RTC CMOS

JP8: SRTC Reset Selection (Pitch 2.54mm)



Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear ME Registers

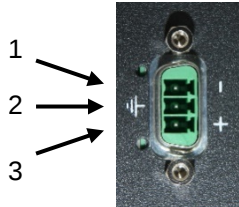
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Panel Connector Pin Assignments

PWR: Input Power Connector



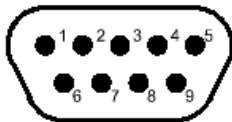
Pin	Signal
1	GND
2	Shield
3	VCC

Mating connector
Phoenix Contact PSC 1,5/ 3-F Order# 1841909



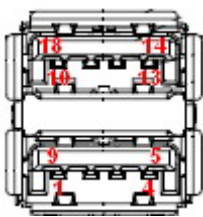
X1: COM1 RS-232/422/485 (via internal cable connection to CN15)

X2: COM2 RS-232/422/485 (via internal cable connection to CN16)



Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
1	DCD	Tx-	DATA-	Tx-
2	RxD	Tx+	DATA+	Tx-
3	TxD	Rx+	-	Rx+
4	DTR	Rx-	-	Rx-
5	GND	GND	GND	GND
6	DSR	-	-	-
7	RTS	-	-	-
8	CTS	-	-	-
9	RI	-	-	-

CN2: USB3.0 Port-0,1 Type-A Connector



Pin	Signal Name	Pin	Signal Name
1	+USBA_VCC	10	+USBB_VCC
2	USBA_D-	11	USBB_D-
3	USBA_D+	12	USBB_D+
4	GND	13	GND
5	USBA_RX-	14	USBB_RX-
6	USBA_RX+	15	USBB_RX+
7	GND	16	GND
8	USBA_TX-	17	USBB_TX-
9	USBA_TX+	18	USBB_TX+

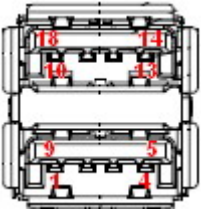
* : The power source of +USBVCC can be selected by JP5.

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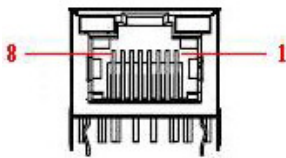
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CN3: USB3.0 Port-2,3 Type-A Connector

	Pin	Signal Name	Pin	Signal Name
	1	+USBA_VCC	10	+USBB_VCC
	2	USBA_D-	11	USBB_D-
	3	USBA_D-	12	USBB_D-
	4	GND	13	GND
	5	USBA_RX-	14	USBB_RX-
	6	USBA_RX+	15	USBB_RX+
	7	GND	16	GND
	8	USBA_TX-	17	USBB_TX-
	9	USBA_TX+	18	USBB_TX+

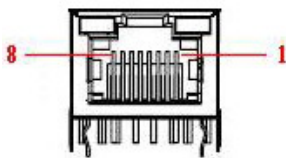
* : The power source of +USBVCC can be selected by JP5.

CN11: GbE LAN1 RJ-45 Connector



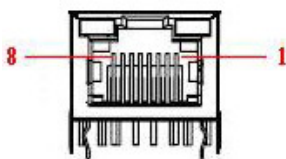
Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-

CN12: GbE LAN2 RJ-45 Connector



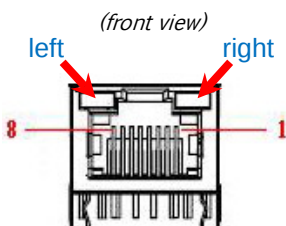
Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-

CN13: GbE LAN2 RJ-45 Connector



Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-

LED Diagram of LAN Connectors:



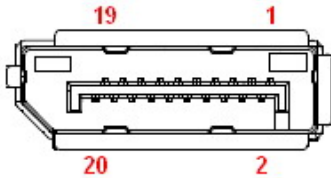
left LED: activity / link	
off	No LAN connectivity
yellow	link
blinking	activity

right LED: 10/100/1000	
off	10 Mbit
green	100 Mbit
orange	1 GbE

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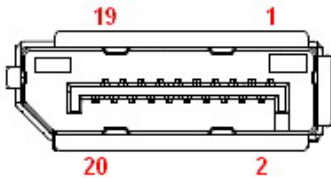
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DP1: DisplayPort Port-1 Connector



Pin	Signal	Pin	Signal
1	TX0+	11	GND
2	GND	12	TX3-
3	TX0-	13	GND
4	TX1+	14	GND
5	GND	15	AUX+
6	TX1-	16	GND
7	TX2+	17	AUX-
8	GND	18	HPD
9	TX2-	19	GND
10	TX3+	20	PWR

DP2: Dual Mode DisplayPort Port-2 Connector *



Pin	Signal	Pin	Signal
1	TX0+	11	GND
2	GND	12	TX3-
3	TX0-	13	GND
4	TX1+	14	GND
5	GND	15	AUX+
6	TX1-	16	GND
7	TX2+	17	AUX-
8	GND	18	HPD
9	TX2-	19	GND
10	TX3+	20	PWR

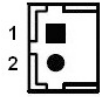
* The Dual-Mode DisplayPort source automatically detects the presence of a plugged-in Dual-Mode DisplayPort cable adaptor and provides the DVI or HDMI signal, as required, to support the connected DVI or HDMI monitor

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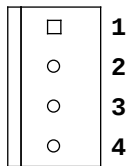
Internal Connector Pin Assignment

BAT1: Battery Power Input Wafer



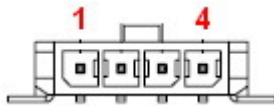
Pin	Signal Name
1	+VBAT
2	GND

CN1: SATA HDD Power Output Wafer



Pin	Signal Name
1	+12V
2	GND
3	GND
4	+5V

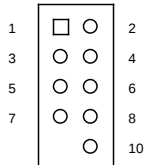
CN4: Power Input Wafer (internal cable connection to DC-DC-Converter)



Pin	Signal
1	+Vin
2	GND
3	GND
4	+Vin

CN5: USB2.0 Port 10, 11 Pin Header

(not used for Rail-PC-System !!)

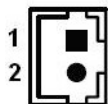


Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND

* : The power source of +USBVCC can be selected by JP7

CN7: Right Channel 2W Audio AMP Output Wafer

(not used for Rail-PC-System !!)



Pin	Signal Name
1	Speaker+
2	Speaker-

CN8: Left Channel 2W Audio AMP Output Wafer

(not used for Rail-PC-System !!)



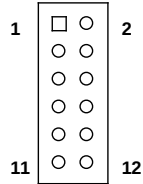
Pin	Signal Name
1	Speaker+
2	Speaker-

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CN9: Audio Pin Header

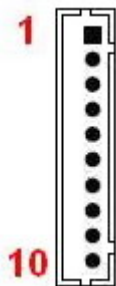
(not used for Rail-PC-System !!)



Pin	Signal Name	Pin	Signal Name
1	MIC_IN_L	2	MIC_IN_R
3	MIC_IN_JD	4	GND
5	LINE_IN_L	6	LINE_IN_R
7	LINE_IN_JD	8	GND
9	LINE_OUT_L	10	LINE_OUT_R
11	LINE_OUT_JD	12	GND

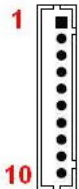
CN10: Digital Input / Output Wafer

(not used for Rail-PC-System !!)



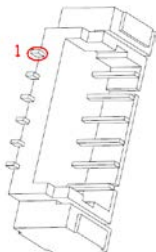
Pin	Signal Name
1	+5V
2	Digital Input 0
3	Digital Output 0
4	Digital Input 1
5	Digital Output 1
6	Digital Input 2
7	Digital Output 2
8	Digital Input 3
9	Digital Output 3
10	GND

CN15 / CN16: RS-232/422/485 Port 1 / 2 Wafer



CN17: SIM Interface Wafer for MPCIE2

(not used for Rail-PC-System !!)



Pin	Signal Name
1	UIM_PWR
2	UIM_DATA
3	UIM_RESET
4	UIM_VPP
5	UIM_CLK
6	GND

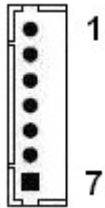
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CN18: Backlight Power Output Wafer for LVDS1

(not used for Rail-PC-System !!)



Pin	Signal Name
1	BL_ADJ_PWM *
2	BL_ADJ_VOL *
3	GND
4	+5V / +12V **
5	+5V / +12V **
6	GND
7	BL_EN***

* : BL_ADJ can be setting in BIOS setup.

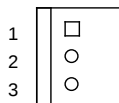
** : Backlight Power can be selected by JP1.

*** : BL_EN can be selected by JP3.

DIMM1: DDR3 Memory SO-DIMM Socket

FAN1: CPU FAN Wafer

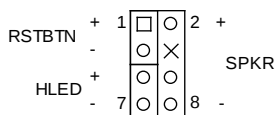
(not used for Rail-PC-System !!)



Pin	Signal
1	GND
2	+12V*
3	FAN_RPM

* : PWM Fan control supported.

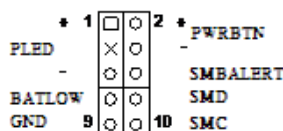
FP1: Front Panel 1 Pin Header



Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	Internal Speaker-
7	HDD LED -	8	Speaker -

Note : Internal Buzzer is enabled when Pin6-8 is shorted.

FP2: Front Panel 2 Pin Header



Pin	Signal	Pin	Signal
1	Power LED +	2	Power Button +
3	NC	4	Power Button -
5	Power LED -	6	SMBALERT#
7	BATLOW#	8	SMBus Data
9	GND	10	SMBus Clock

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LVDS1: Primary 24-bit, 2-channel LVDS Panel Connector

(not used for Rail-PC-System !!)



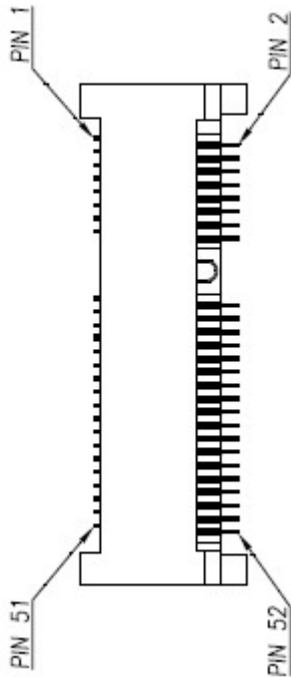
Pin	Signal Name	Pin	Signal Name
1	LVDS_A0-	16	LVDS_B1+
2	LVDS_A0+	17	GND
3	LVDS_A1-	18	LVDS_B2-
4	LVDS_A1+	19	LVDS_B2+
5	LVDS_A2-	20	LVDSBCLK-
6	LVDS_A2+	21	LVDS_BCLK+
7	GND	22	LVDS_B3-/NC
8	LVDS_ACLK-	23	LVDS_B3+/NC
9	LVDS_ACLK+	24	GND
10	LVDS_A3-/NC	25	DDC_DATA
11	LVDS_A3+/NC	26	VDDEN
12	LVDS_B0-	27	DDC_CLK
13	LVDS_B0+	28	+3.3V / +5V *
14	GND	29	+3.3V / +5V *
15	LVDS_B1-	30	+3.3V / +5V *

* : Panel Power can be selected by JP1.

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mPCIE1: Mini-PCIE Express v1.2 Socket / mSATA



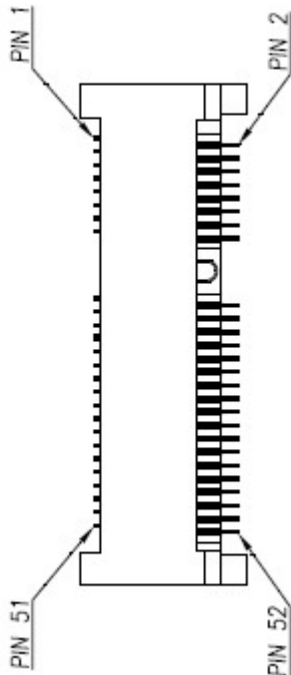
Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	NC
Ground	9	10	NC
REFCLK-	11	12	NC
REFCLK+	13	14	NC
Ground	15	16	NC
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB

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mPCIE2: Mini-PCIE Express v1.2 Socket

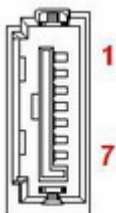


Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	UIM_PWR*
Ground	9	10	UIM_DATA*
REFCLK-	11	12	UIM_CLK*
REFCLK+	13	14	UIM_RESET*
Ground	15	16	UIM_VPP*
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB

* : These pins are connected to CN17 directly.

SATA1: Serial ATA Port 0 Connector

SATA2: Serial ATA Port 1 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

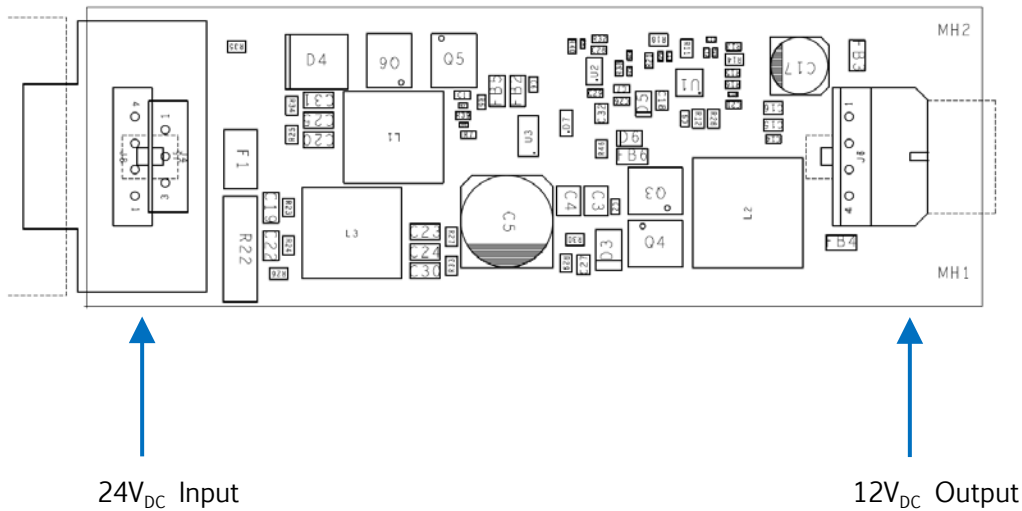
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24V-to-12VDC – Converter

(Internal usage only)



24V_{DC} in



Phoenix Contact PSC 1,5/ 3-M

Pin	Signal
1	GND
2	SHLD
3	VCC

12V_{DC} out



Molex 43650-0403

Pin	Signal
1	+12V
2	GND
3	GND
4	+12V