JetBox 5300 User Manual

Hardware

www.korenix.com

0.0.1

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Acknowledgments

Table of Content

Chapter 1 Overview

Industrial 2 LAN, 4 Serial and 8DIO Linux Computer

Korenix is devoted to the Linux computing and benefits customers by providing the JetBox series with embedded Linux ready system and easy-to-use interface. Compared to general purpose Linux system, embedded Linux is performance- optimized for front-end industrial control. The JetBox5300 is a RISC-based computer with lower power consumption and is stable and reliable. The JetBox5300 carries 2 LAN ports, 2 USB ports, 2 RS232/422/485, 2 RS232, 4 digital inputs and 4 outputs to be the best solution in industrial control.

Digital Input & Output

Digital inputs and outputs are widely used in industrial applications such as indicators, alarms, reed switches, or sensors. The compact JetBox carries 4 digital output and 4 digital input channels and work as a front-end control agent.

Dual power inputs

The JetBox 5300 carries dual power inputs to make a power redundancy to reduce the impact of unstable power inputs.

Chapter 2 Hardware Specification

2-1 Hardware Specification

Model	JetBox 5300
CPU	Atmel ARM AT91RM9200 180 MHz
Flash Memory	16MB Flash ROM
SDRAM	64MB
RTC	Battery backup external RTC
Battery	3V Li-Battery
WDT	Internal Watch Dog Timer
COM port	16C550 compatible RS232 * 2, RS232/422/485 * 2
SD Card Interface	1 slot (Applications)
Reset Button	1
USB Host	USB v2.0 Host Port * 2
LED Indicator	Power * 2, SD * 1, Ethernet * 2 sets (2 indicators for each port)
Ethernet	10/100 Base-T * 2
DIO	Buffered TTL DI *4, DO * 4
Long Range Termination Switch	4 dip for two 120 ohm terminations for Long Distance RS422/485
Power Switch	1
Power Input	12VDC-48VDC (-48VDC) 4 pin terminal block for Dual power inputs
Power Consumption	7.2W
Construction	Rugged Aluminum Alloy Chassis, IP31 protection
Color	Silver
Mounting	DIN rail
Dimensions	66(W)*149(H)*120.5(D)mm
Operating Temperature	-40℃ ~ 80℃, 5 to 95% RH
Net Weight	700g

Table 1 JetBox 5300 HW specification

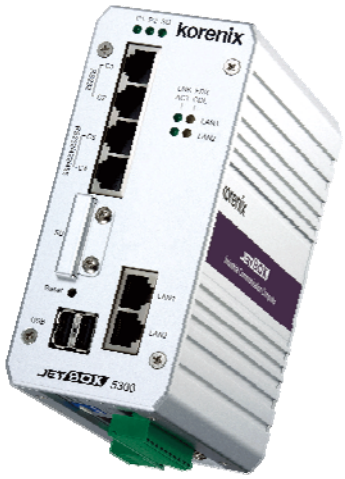
2-2 Regulation

EMI: FCC class A, EN55022 Class A
EMC: EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11
Safety: CE, UL*, cUL*, EN60950*
Shock: IEC60068-2-27 (50g peak acceleration)
Vibration: IEC60068-2-6 (5g/ 5~500Hz/random operation)
MTBF: At least 200,000 hours @25℃
Warranty: 5 years

*pending

Chapter 3 Hardware Feature

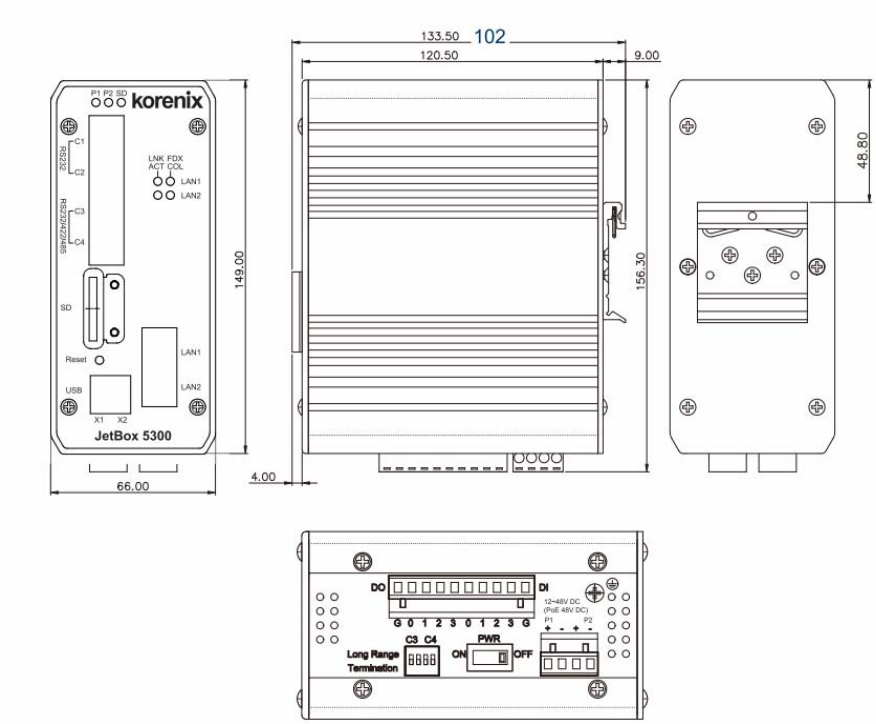
Following pictures show the appearance of JetBox 5300.



Picture 1 JetBox 5300 appearances

3-1 Dimensions

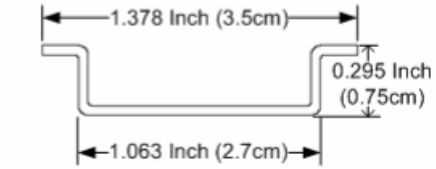
Following is the mechanical outline for JetBox 5300.



Picture 2 JetBox 5300 mechanical outline

3-2 DIN-Rail Mounting

The DIN-Rail clip is already attached on the rear side of JetBox 5300 supports EN 50022 standard DIN Rail, in the following diagram includes the dimension of EN 55022 DIN Rail for your reference.



DIN EN 50022 DIN Rail Dimension

Follow the steps below to mount JetBox 5300 on the DIN-Rail track.

1. Insert the upper end of the DIN-Rail clip into the back of the DIN-Rail track from its upper side
2. Lightly push the bottom of the DIN-Rail clip into the track.
3. Check if the DIN-Rail clip is tightly attached to the track.
4. To remove the JetBox 5300 from the track, reverse the steps above.

3-3 Front Panel Connectors

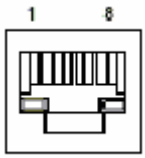
3-3-1 Serial port with RJ45 connector (C1~C4)

JetBox 5300 provides 4 serial ports. You can use the Linux command to do the serial setting.

Port and interface list

Port	RS232	RS422	RS485 (2 wires)	RS485 (4 wires)
COM1	Full			
COM2	Half			
COM3	Half	V	V	V
COM4	Half	V	V	V

Table 2 RS232/422/485 serial setting of JetBox 5300



Picture 3 RJ45 connector for serial port

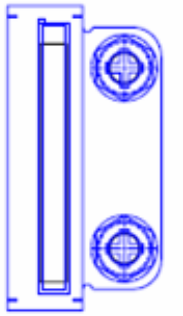
PIN	RS-232 Full-function	RS-232 Half-function	RS-422	RS-485 (2-wire)	RS-485 (4-wire)
1	**DSR**				
2	**RTS**	**RTS**			
3	**GND**	**GND**	**GND**	**GND**	**GND**
4	**TxD**	**TxD**	**TxD+(B)**	**DATA+**	**TxD+(B)**
5	**RxD**	**RxD**	**RxD+(B)**		**RxD+(B)**
6	**DCD**		**RxD-(A)**		**RxD-(A)**
7	**CTS**	**CTS**			
8	**DTR**		**TxD-(A)**	**DATA-**	**TxD-(A)**

Table 3 RJ45 PIN assignment for serial ports of JetBox 5300

For COM3 and COM4, you can use the corresponding long range termination switches on the bottom of JetBox 5300 to adjust the terminators for RS422 or RS485. (Please Reference 3-3-2 for more information.)

3-3-2 SD Card Slot with a Blocker

JetBox 5300 provides one SD card slot for the firmware upgrade or the configuration backup. JetBox5300 also provides a blocker with 2 screws to fix the SD card inside to prevent the SD card from falling. The connector of SD card is on the left side when you insert the SD card into the slot.



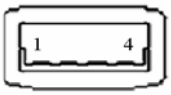
Picture 4 SD card slot with a blocker in JetBox 5300

3-3-3 Reset Button

This button is used to reset the system back to previous configuration. Long press 3 seconds on the reset button to go back to the last configuration. Long press 7 seconds on the reset button to go back to the factory default configuration.

3-3-4 USB Connector (USBx1, USBx2)

JetBox 5300 provides 2 USB type “A” female connectors for USB peripherals.



Picture 5 USB connector

Pin	USB Signal Name
1	VCC
2	DATA-
3	DATA+
4	GND

Table 4 USB PIN assignment of JetBox 5300

3-3-5 Indicators

3-3-5-1 Power LED

JetBox 5300 provides two indicators (P1 & P2) for corresponding power inputs. The indicators are used to present the status of power on or power off. If the power is properly supplied, the power indicators (P1, P2) show a solid green color.

3-3-5-2 SD card LED

JetBox 5300 provides one SD card indicator for the corresponding SD card. The indicator is to present whether a SD card is inserted or not. If a SD card is inserted properly, the power indicator shows a solid green color.

3-3-5-3 Ethernet LED

JetBox 5300 provides 2 Ethernet indicators for each Ethernet port. One is

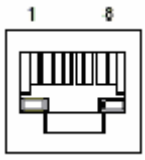
orange LED indicator for the status of full duplex, half duplex, and packet collision. The other green LED indicator is for the status of connection link, connection break and active communication.

Indicator	Indicator color	Ethernet status
Orange	None	Half duplex
	A solid orange color	Full duplex
	A blinking orange color	Packet collision
Green	None	Connection break
	A solid green color	Connection link
	A blinking green color	Active transmission or reception

Table 5 Ethernet LED status of JetBox 5300

3-3-6 Ethernet Connector (LAN1~LAN2)

There are two Ethernet ports (using RJ45 connector) of JetBox 5300. For the system, there are one network interface and the two Ethernet ports have switching ability.



Picture 6 RJ45 connector for Ethernet port

Pin	10/100 BaseT Signal Name
1	Tx+
2	Tx-
3	Rx+
4	
5	
6	Rx-
7	
8	

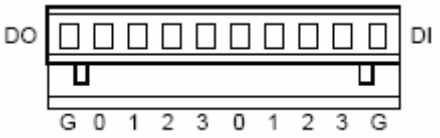
Table 6 RJ45 Ethernet port PIN assignment of JetBox 5300

⚠**Notice 1:** JetBox 5300 supports automatic MDI/MDIX crossover for 100Base-Tx and 10Best-T ports. The system will detect Tx & Rx signal and adjust related PIN assignment automatically.

3-4 Bottom Connectors

3-4-1 Digital IO Connector

JetBox 5300 use GPIO (General Purpose Input/Output) of CPU to provide four digital inputs and four digital outputs for device control. The digital IO connector is a 10 pin terminal block.



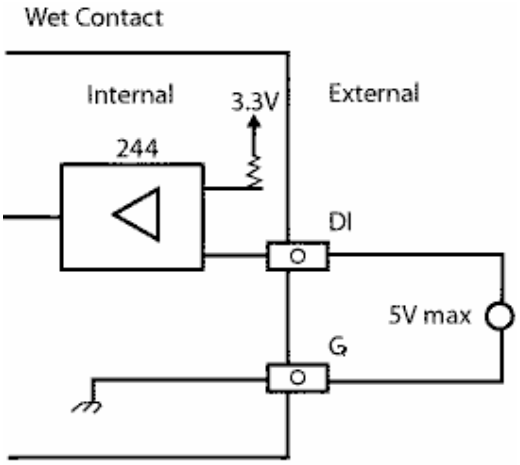
Picture 7 Digital IO connector of JetBox 5300

3-4-1-1 Digital Input

The values of each digital input are low (0 volt) and high (2~5 volts). Maximum input current is 5u A at 6.5 Voltage.

⚠**Notice 2:** Over voltage or over current for digital input will damage JetBox.

JetBox 5300 supports 4 digital input channels. Below figure shows the way to use digital input function.



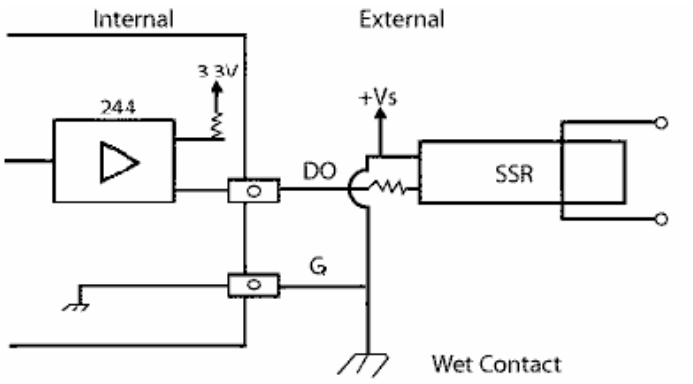
Picture 8 Wet connection for digital input in JetBox 5300

3-4-1-2 Digital Output

The values of each digital output are low (0 volt) and high (2.5 ~ 3.3 volts). Maximum output current is 24mA at 3V

⚠**Notice 3:** Improper operation of DO might damage the opposite devices.

JetBox 5300 supports 4 digital output channels. Below figure shows how to use digital output function.



Picture 9 Wet connection for digital output in JetBox 5300

3-4-2 Long Range Termination Switch

JetBox 5300 uses the dip switches to add an 120 ohm Terminator for Long Distance 4-wire RS485/RS422 or 2-wire RS485 communication.

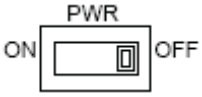
Picture 10 Long range termination switch of JetBox 5300

DIP1 DIP3	DIP2 DIP4	Description
On	On	**120ohm Terminator for Long Distance 4-wire RS-422/485**
Off	On	**This setting will cause ERRORS!**
On	Off	**120ohm Terminator for Long Distance 2-wire RS-485**
Off	Off	**No Terminator for RS-232/422/485 (short distance)**

Table 7 Long range termination switch PIN assignment of JetBox 5300

3-4-3 Power ON/OFF Switch

This switch is used to power on or power off JetBox 5300.



Picture 11 Power switch of JetBox 5300

3-4-4 Power Connector

JetBox 5300 comes with a 4 pin terminal block that carries external DC power input.

Connect the DC power line to the DC terminal block at the bottom of JetBox 5300 and turn on the power switch to power JetBox 5300.

Power supply

DC input: 12~48V (-48V) dual power input

Power consumption

1. idle status

Single input: 5.4Watt at 12Volt, 6.72Watt at 48Volt

Dual input: 5.28Watt at 12Volt, 7.2Watt at 48Volt

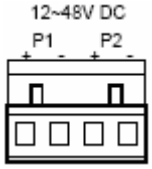
2. Maximum normal load

Power input 12~48V DC: Max. 1.2A

Maximum normal load was defined as follows: All the interface of the JetBox connected to the related devices and transmitted digital data continuously. +

⚠**Notice 4:** Improper power input will damage the device

⚠**Notice 5:** Please use the UL listed power supply.

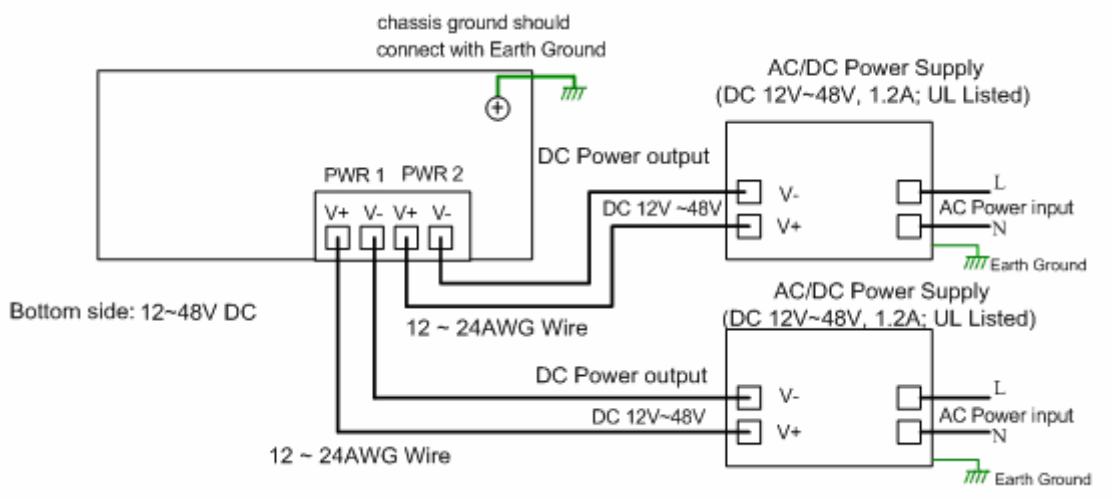


Picture 12 Power connector of JetBox 5300

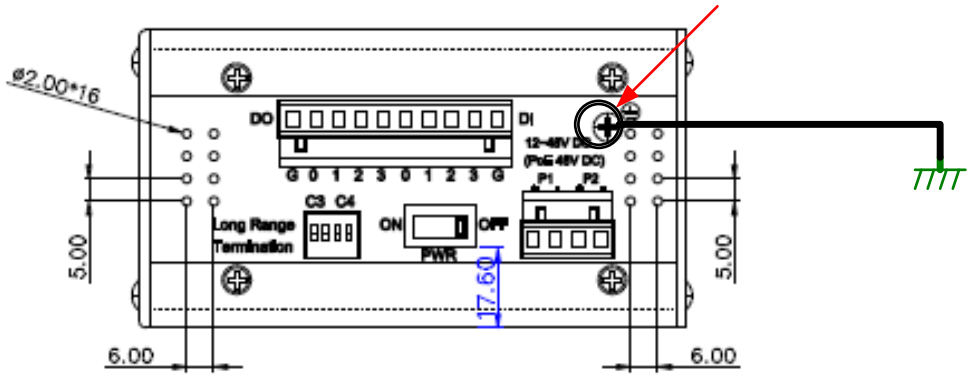
Pin	Power Signal Name
1	VCC
2	GND
3	VCC
4	GND

Table 8 Power connector PIN assignment of JetBox 5300

Following pictures are the power wiring diagrams and the earth grounding for the JetBox 5300



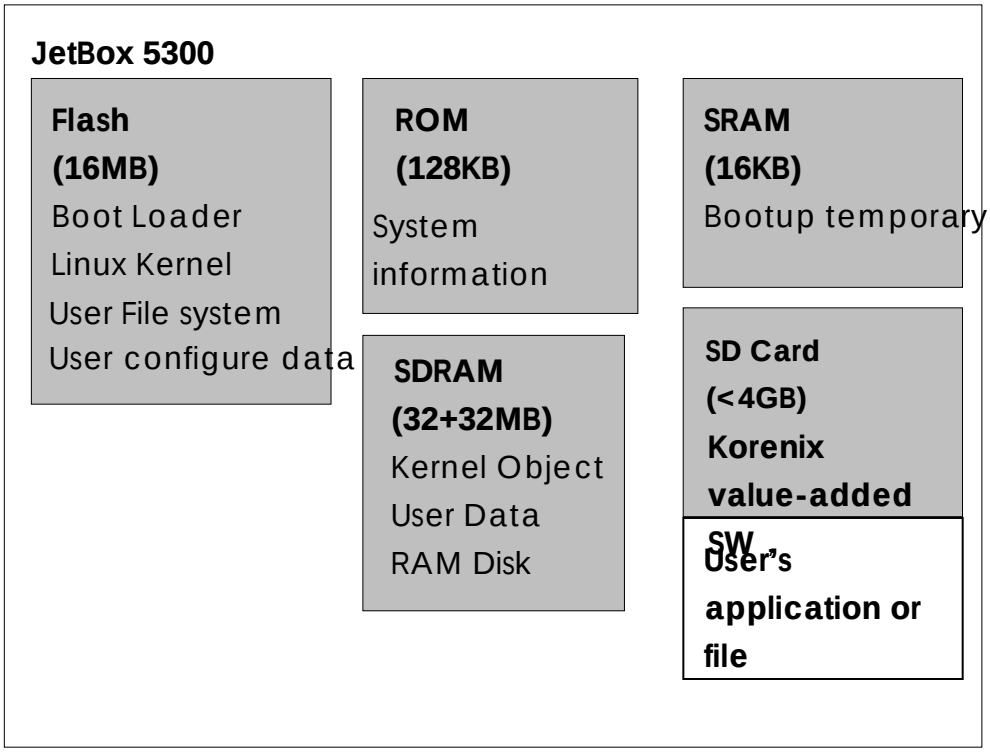
Picture 13: The JetBox 5300 power wiring diagram



Picture 14: The JetBox 5300 earth grounding

3-5 Memory and Storage

The following figure shows the memory architecture of JetBox 5300. The gray block means it is reserved as system usage.



Picture 15 System memory and storage of JetBox 5300

Flash

There is a 16M Byte Flash ROM for the system firmware. The flash is arranged for Linux kernel, Linux file system, Linux user data setting (none volatile storage), and the boot loader.

SDRAM

There are two on-board 32 M Byte SDRAMs. They are arranged for Linux kernel object, system information maintenance, and program data of user's applications. They are also used as a RAM DISK to store user's temporary data.

SD card (the capacity is supported up to 4G)

One SD card interface is designed for Korenix value-added SW as an optional accessory. Users can also use the rest available capacity to store their own applications or files.

Chapter 4 Appendix

4-1 Chart Index

Table

Picture

Notice (Limitation of JetBox 5300)

4-2 Customer Service

Korenix Technologies Co., Ltd.

Business service: sales@korenix.com

Customer service: koreCARE@korenix.com