



®

***AXIOMTEK***

**IFB112**

**Hardware User's Manual**



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**July 2017, Version A1**

**Printed in Taiwan**

## Safety Precautions

Before getting started, please read the following important safety precautions.

1. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
2. Disconnect the power cord from the IFB112 before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the IFB112 is properly grounded.
3. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
4. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
5. Do not leave this equipment in an uncontrolled environment where the storage temperature is below  $-45^{\circ}\text{C}$  or above  $85^{\circ}\text{C}$ . It may damage the equipment.
6. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
  - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
  - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

## **Classification**

1. Degree of protection against electric shock: not classified
2. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitros oxide.
3. Mode of operation: Continuous
4. Type of protection against electric shock: Class I equipment

## **General Cleaning Tips**

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
2. Turn the system off before you start to clean up the component or computer.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
5. Try not to put any food, drink or cigarette around the computer.

## Cleaning Tools

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.



***We strongly recommended that you should shut down the system before you start to clean any single components.***

**Note**

**Please follow the steps below:**

1. Close all application programs
2. Close operating software
3. Turn off power
4. Remove all device
5. Pull out power cable

## **Scrap Computer Recycling**

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

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# Table of Contents

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<b>Safety Precautions</b> .....	<b>iii</b>
<b>Classification</b> .....	<b>iv</b>
<b>General Cleaning Tips</b> .....	<b>iv</b>
<b>Cleaning Tools</b> .....	<b>v</b>
<b>Scrap Computer Recycling</b> .....	<b>vi</b>
<b>CHAPTER 1 INTRODUCTION</b> .....	<b>1</b>
<b>1.1 General Description</b> .....	<b>1</b>
<b>1.2 System Specifications</b> .....	<b>2</b>
1.2.1 CPU .....	2
1.2.2 System Memory .....	2
1.2.3 Console Port .....	2
1.2.4 LAN .....	2
1.2.5 Storage .....	2
1.2.6 USB.....	2
1.2.7 WatchDog Timer (WDT).....	2
1.2.8 COM.....	3
1.2.9 CAN .....	3
1.2.10 Power.....	4
1.2.11 Digital I/O,Relay,Console Connector and Pin Definition .....	4
1.2.12 System LED.....	8
1.2.13 Wireless (3G/GPRS or Wifi).....	9
1.2.14 Reset Button .....	9
1.2.15 Operation Temperature .....	9
1.2.16 Storage Temperature .....	9
1.2.17 Humidity.....	9
1.2.18 Weight .....	9
1.2.19 Dimensions.....	9
1.2.20 System I/O Outlet .....	9
<b>1.3 Jumper setting</b> .....	<b>10</b>
1.3.1 JP1 setting .....	10
1.3.2 JP3 setting .....	10
<b>1.4 Dimensions</b> .....	<b>11</b>
<b>1.5 I/O Outlets</b> .....	<b>12</b>
<b>1.6 Packing List</b> .....	<b>13</b>
<b>CHAPTER 2 HARDWARE INSTALLATION</b> .....	<b>15</b>
<b>2.1 Installing Din-rail Mounting</b> .....	<b>15</b>
<b>2.2 Installing Wall Mounting (Opitonal)</b> .....	<b>15</b>

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# CHAPTER 1

## INTRODUCTION

This chapter contains general information and detailed specifications of the IFB112. The Chapter 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets
- Packing List

### 1.1 General Description

IFB112 cost-effective din-rail fanless embedded system utilizes the low power RISC-based module (iMX6UL) processor and is designed to withstand temperatures ranging from  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  for using in extreme operating environment and industrial automation applications.

IFB112 features 1 RS-232/422/485 serial ports, 1 CAN bus, dual LANs, 1 DIO Port (2-In/1-Out), 1 eMMC 4GB onboard. Its vertical din-rail form factor makes it easy to install the system in a small cabinet. Due to the RISC-based architecture, IFB112 will not generate a lot of heat while being operated.

- **Features**

- Fanless
- Wide temperature operation of  $-40^{\circ}\text{C}$  -  $+70^{\circ}\text{C}$
- Low power RISC-based module (i.MX6UL), 528MHz Processor
- 2 x 10/100Mbps Ethernets with magnetic isolation protection
- 1 x COM Ports
- 1 x CAN bus
- 1 x USB 2.0 with power distribution control and over current protection
- 1 x DIO Port (2-In/1-Out) with Dry/Wet contacts
- 1 x Console Port for user setting with debug
- 1 x Watchdog Timer
- LED Indicators (for user config)
- Storage:
  - Support one eMMC 4GB onboard (for boot disk)
- 1 power paths with terminal block and 9–48VDC
- Din-rail mounting

## 1.2 System Specifications

### 1.2.1 CPU

- Low power RISC-based module (iMX6UL), ARM Cortex-A7 RISC-based 528MHz Processor

### 1.2.2 System Memory

- 1 x DDR3 256MB SDRAM onboard

### 1.2.3 Console Port

- For user setting with debug
- Connected to DIO terminal Block

### 1.2.4 LAN

- LAN 1 / LAN 2
  - 10/100Mbps LAN w/ magnetic isolation protection 1.5KV
  - 10/100Mbps LAN w/ magnetic isolation protection 1.5KV

### 1.2.5 Storage

- 1 x eMMC 4GB onboard (for boot disk)

### 1.2.6 USB

- 1 x USB2.0 port

### 1.2.7 WatchDog Timer (WDT)

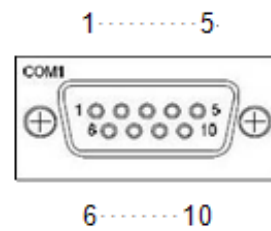
- 1 WatchDog Timer

### 1.2.8 COM

- DB9 Pin define
- RS232/RS422/RS485 (COM1)
- COM with TX/RX/RTS/CTS signals
- RS-232/422/485 Interface select by software

#### COM1

Pin	RS-232	RS-422	RS-485
1		TX-	Data-
2	RX	TX+	Data+
3	TX	RX+	--
4		RX-	--
5	Ground	Ground	Ground
6		--	--
7	RTS	--	--
8	CTS	--	--
9		--	--

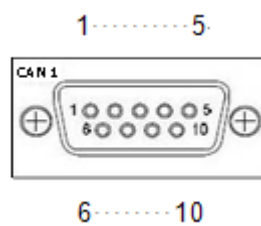


### 1.2.9 CAN

- DB9 Connector
- CAN bus 2.0 B Ports
- CAN bus Design Specification

#### CAN1

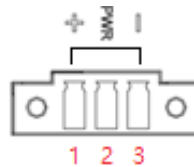
Pin	RS-232
1	
2	CAN1_L
3	GND
4	
5	
6	
7	CAN1_H
8	
9	



**1.2.10 Power**

- DC input range 9~48V
- Power consumption 9~48VDC, 0.55A~0.1A
  - 0.55A@9V
  - 0.1A@48V
  - 0.4A@12V
- DC Terminal Block

Pin	DC Signal Name
1	Power+
2	-
3	Power-

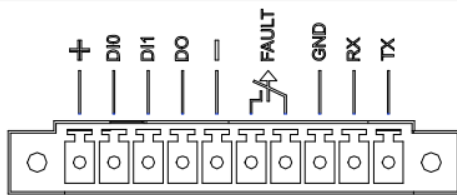


**1.2.11 Digital I/O,Relay,Console Connector and Pin Definition**

- 2 DI/ 1DO
- DI: Wet/Dry
- DO: Wet
- DIO Design Specification

Digital Input	
Input Channels	2,source type
Input Voltage	0 to 24VDC
Digital Input Levels for Dry Contacts	Logic level 0:Close to GND Logic level 1:Open
Digital Input Levels for Wet Contacts	Logic level 0: Close to GND Logic level 1:+0.7~+24V max.
Digital Output	
Output Channels	1,sink type
Output Current	Max. 200 mA per channel
On-state Voltage	24VDC nominal

- DIO 2-IN/1-OUT of TB10 Female with relay and console port.



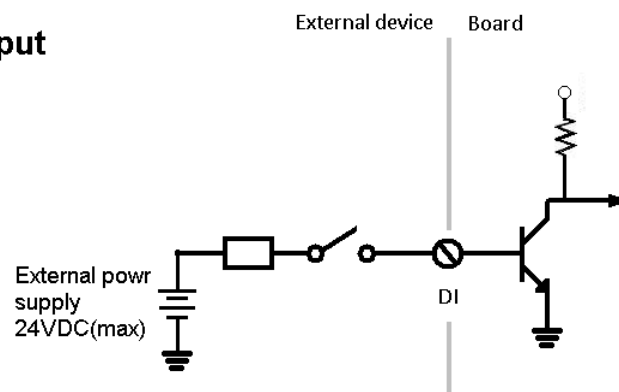
IFB112 DIO Terminal Block

TB18 Pin No.	Signal name	Meaning
1	COM+	Plus Common for DIO
2	DI0	Digital Input
3	DI1	
4	DO	Digital Output
5	COM-	Minus Common for DIO
6	Relay+	Relay Out
7	Relay-	
8	GND	Console Port
9	Console RX	
10	Console TX	

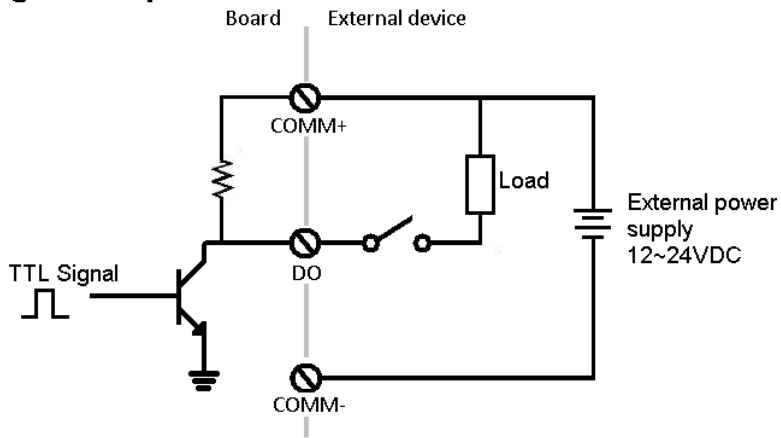
- DIO operation schematic diagram

**Input Circuit**

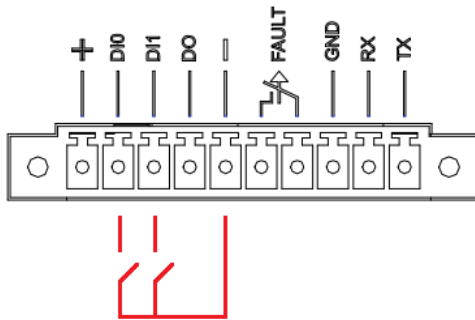
**Digital Input**



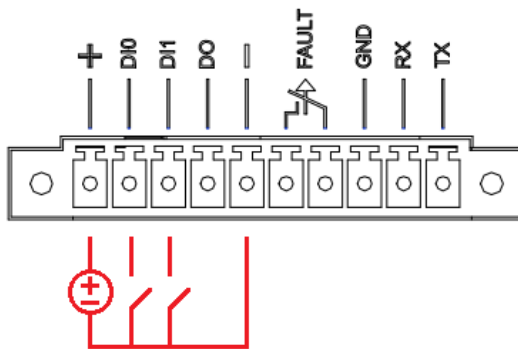
### Output Circuit Digital Output



- **Digital Input Wiring**  
**Dry Contact**



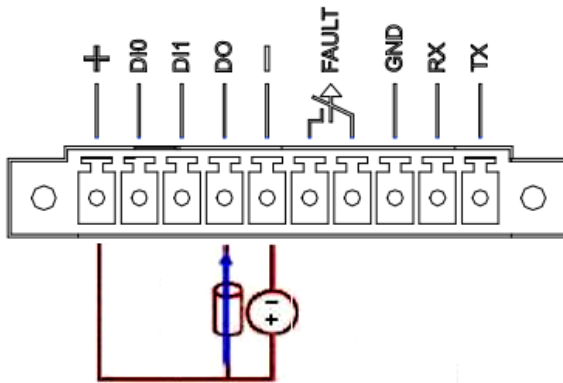
### Wet Contact



*If you are using wet contacts, you must connect COM to power.*

**Note**

- **Digital Output Wiring**

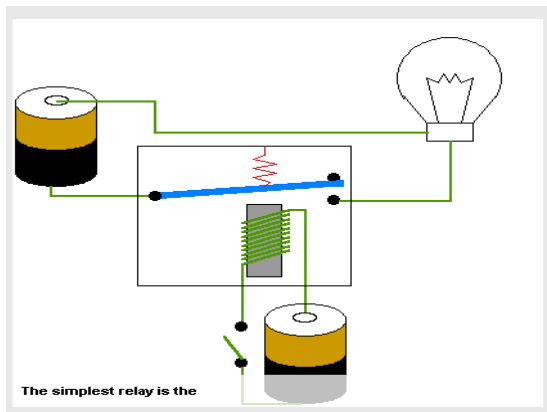


- **Relay output with 0.5A @30VDC**

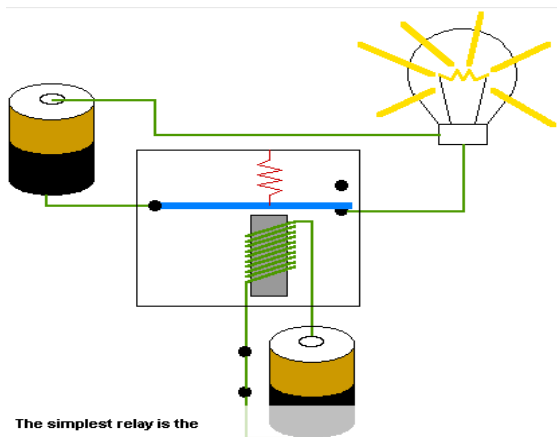
Relay output

There is a very simple application for remote notice that uses relay and lamp as below.

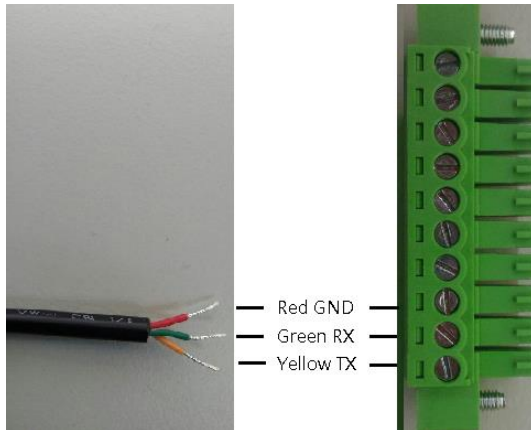
1. Normal



2. Warning



- **Console cable pin definition**



- **DIO Terminal Block**

TB18 Pin No.	Signal name	Meaning
1	COM+	Plus Common for DIO
2	DI0	Digital Input
3	DI1	
4	DO	Digital Output
5	COM-	Minus Common for DIO
6	Relay+	Relay Out
7	Relay-	
8	GND	For Console Port
9	Console RX	
10	Console TX	

### 1.2.12 System LED

LED Name	Description	Color	Note
Status	<p>The LED can help users to judge boot finish or not and the OS can normal work or not.</p> <p>When the boot finishing the configuration of system, the LED will ON.</p> <ul style="list-style-type: none"> <li>- The LED is blinking, Bootloader or Linux kernel loading.</li> <li>- The LED always ON, system ready.</li> </ul>	Green	
1~4	GPIO LED for user configuration	Green	



### 1.2.13 Wireless (3G/GPRS or Wifi)

- 1 x Mini card socket 1 (supports USB&PCIE interface) with 1 x SIM Card Socket 1 by inside
- Support WiFi or 3G/GPRS2

### 1.2.14 Reset Button

- 1 x Reset button

### 1.2.15 Operation Temperature

- -40<sup>0</sup>C ~ +70<sup>0</sup>C (-40 °F ~ +158°F)

### 1.2.16 Storage Temperature

- -45<sup>0</sup>C ~ +85<sup>0</sup>C (-49 °F ~ +185°F)

### 1.2.17 Humidity

- 10% ~ 95% (non-condensation)

### 1.2.18 Weight

- 1kg

### 1.2.19 Dimensions

- 31mm(W)x100mm(D)x125mm(H)

### 1.2.20 System I/O Outlet

- 1 x 9-pin D-Sub male connectors, COM
- 1 x CAN bus ( DB9 connector)
- 1 x Console Port
- 2 x 10/100Mbps Ethernets with magnetic isolation protection
- 1 x USB 2.0 with power distribution control and over current protection
- 1 x DIO Port (2-In/1-Out) with Dry/Wet contacts
- DC Powers Input with terminal block
- Relay out



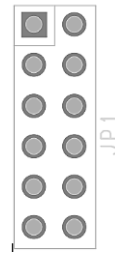
*All specifications and images are subject to change without notice.*

#### Note

### 1.3 Jumper setting

#### 1.3.1 JP1 setting

Function	Setting
Copy image to eMMC	JP1 1-2 Close
Boot to OS (IFB122 eMMC) (Default)	JP2 3-4,5-6 Close JP2 7-8, 11-12 Close
Boot to OS (IFB122 SD Card)	JP2 3-4, 9-10 Close



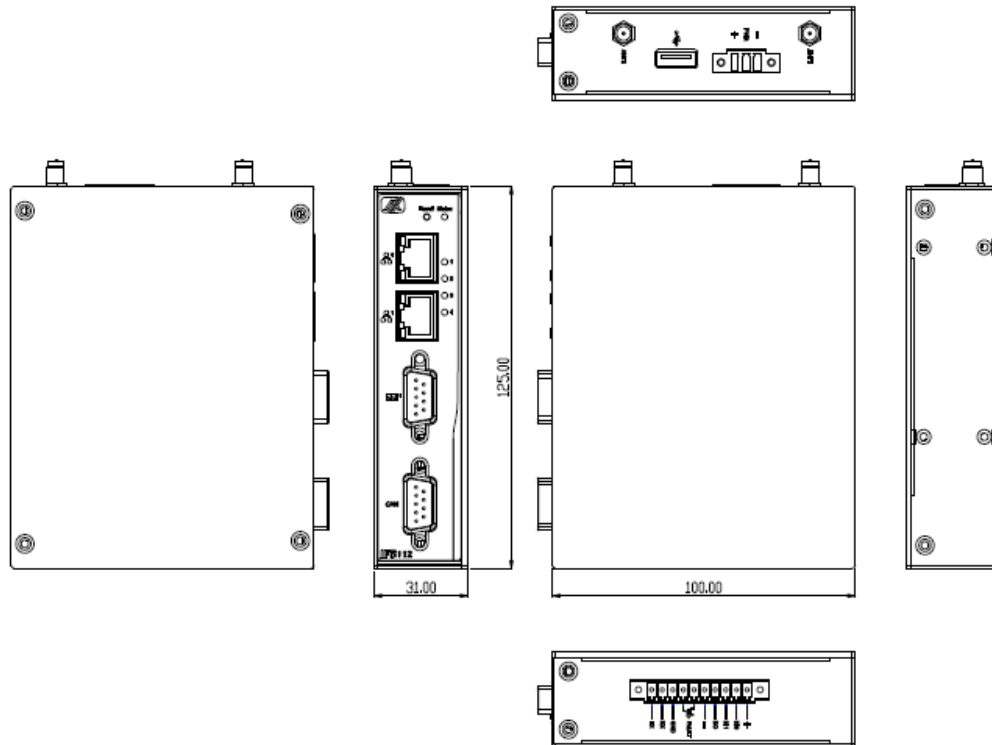
#### 1.3.2 JP3 setting

Function	Setting
OTG Client	JP3 1-2 Close
OTG Host (Default)	JP3 2-3 Close



## 1.4 Dimensions

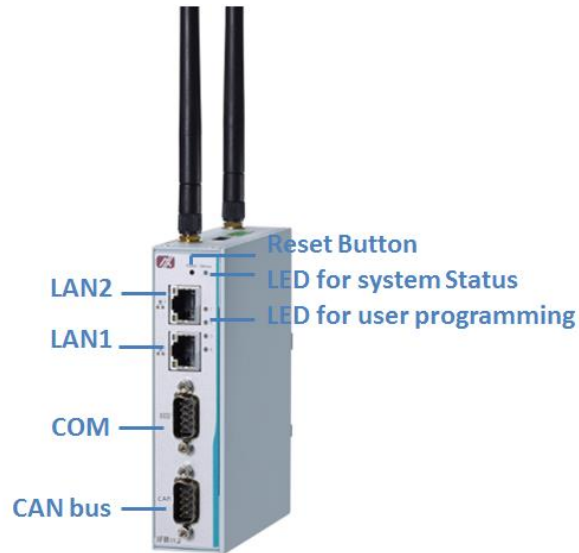
The following diagrams show you dimensions and outlines of the IFB112



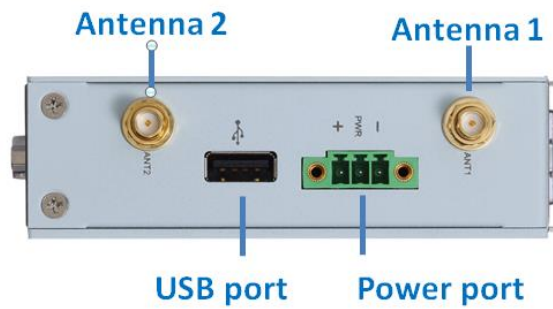
## 1.5 I/O Outlets

The following figures show you I/O outlets on front view and bottom view of the IFB112.

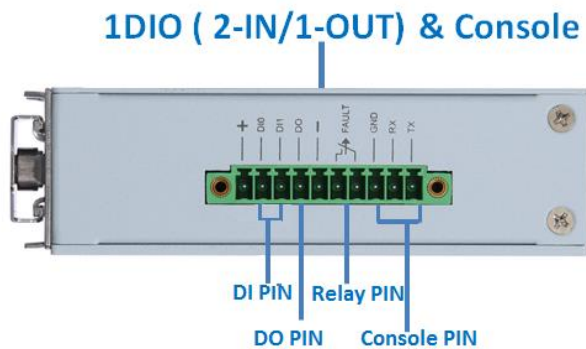
- **Front View**



- **Top View**



- **Bottom View**



## **1.6 Packing List**

The package bundled with your IFB112 should contain the following items:

- IFB112 System Unit x 1
- Din-rail Kit x 1
- Power terminal block x 1
- DIO terminal block x 1
- Console cable x 1

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## CHAPTER 2 HARDWARE INSTALLATION

### 2.1 Installing Din-rail Mounting

The IFB112 provides Din-rail Mount that customers can install as below:

**Prepare DIN Mount assembling components (screws and bracket) ready.**



### 2.2 Installing Wall Mounting (Optional)

The IFB112 provides Wall Mounting that customers can install as below:

**Prepare Wall Mount assembling components (screws and bracket) ready.**

**Assembly the bracket to the system, and fasten screws tight.**



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