



AXIOMTEK

IFB125

Hardware User's Manual



Disclaimers

This manual has been carefully checked and believed to contain accurate information. Axiomtek Co., Ltd. assumes no responsibility for any infringements of patents or any third party's rights, and any liability arising from such use.

Axiomtek does not warrant or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information in this document. Axiomtek does not make any commitment to update the information in this manual.

Axiomtek reserves the right to change or revise this document and/or product at any time without notice.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Axiomtek Co., Ltd.

©Copyright 2019 Axiomtek Co., Ltd.

All Rights Reserved

October 2019, Version A2

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 IFB125 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 IFB125 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°C or above 85°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 nitrous 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 swaps 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.

Trademarks Acknowledgments

Axiomtek is a trademark of Axiomtek Co., Ltd. IBM, PC/AT, PS/2, VGA are trademarks of International Business Machines Corporation.

Intel[®] and Pentium[®] are registered trademarks of Intel Corporation.

MS-DOS, Microsoft C and QuickBASIC are trademarks of Microsoft Corporation.

VIA is a trademark of VIA Technologies, Inc.

SST is a trademark of Silicon Storage Technology, Inc.

UMC is a trademark of United Microelectronics Corporation. Other brand names and trademarks are the properties and registered brands of their respective owners.

Table of Contents

Safety Precautions.....	iii
Classification	iv
General Cleaning Tips	iv
Cleaning Tools	v
Scrap Computer Recycling	vi
CHAPTER 1 INTRODUCTION	1
1.1 General Description	1
1.2 System Specifications	2
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 SPI & I2C	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
1.3 Jumper setting	10
1.3.1 JP1.....	10
1.3.2 JP3.....	10
1.4 Dimensions.....	11
1.5 I/O Outlets	12
1.6 Packing List.....	13
CHAPTER 2 HARDWARE INSTALLATION	15
2.1 Installing Din-rail Mounting	15
2.2 Installing Wall Mounting (Opitonal)	15

This page is intentionally left blank.

CHAPTER 1

INTRODUCTION

This chapter contains general information and detailed specifications of the IFB125. The Chapter 1 includes the following sections:

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

1.1 General Description

IFB125 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°C to +70°C for using in extreme operating environment and industrial automation applications.

IFB125 features 2 RS-232/422/485 serial ports, dual LANs, 1 DIO Port (2-In/1-Out), 1 eMMC onboard 8GB for storage. Its vertical din-rail form factor makes it easy to install the system in a small cabinet. Due to the RISC-based architecture, IFB125 will not generate a lot of heat while being operated.

- **Features**

- Fanless
- Wide temperature operation of -40°C - +70°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 SPI
- 1 x I2C
- 1 x Power output(3.3V@0.5A)
- 1 x USB 2.0 with power distribution control and over current protection
- 1 x DIO Port (2-In/1-Out) with Wet contacts
- 1 x Console Port for debug settings
- 1 x Watchdog Timer
- LED Indicators (for user config)
- Storage:
 - Support one eMMC 8GB 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 debug settings
- 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 8GB onboard (for boot disk)

1.2.6 USB

- 1 x USB2.0 port

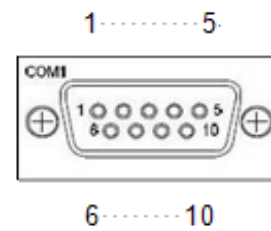
1.2.7 WatchDog Timer (WDT)

- 1 x WatchDog Timer

1.2.8 COM

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

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		--	--

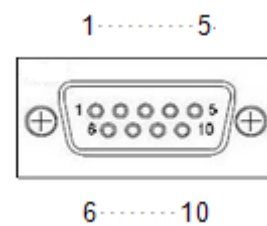


1.2.9 SPI & I2C

- DB9 Pin define
- 1 x SPI function with one chip select
- 1 x I2C function

D-sub9 pin define

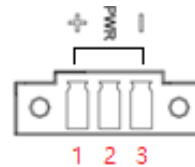
Pin	3.3V power output	SPI	I2C
1		CLK	
2		SS	
3		MOSI	
4		MISO	
5	PWR GND		
6		SIG GND	SIG GND
7			SDA
8			SCL
9	3.3V		



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-

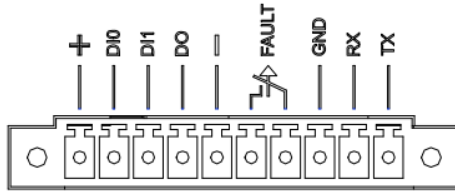


1.2.11 Digital I/O,Relay,Console Connector and Pin Definition

- 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 comsole port.



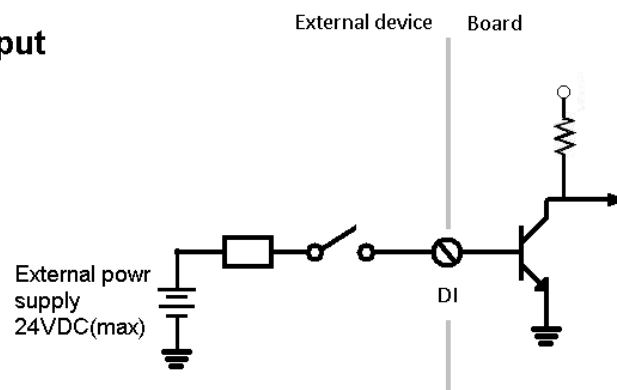
IFB125 DIO Terminal Block

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

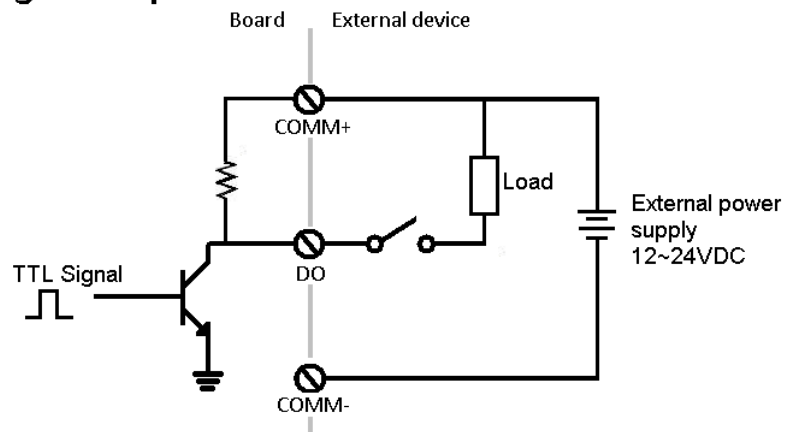
Input Circuit

Digital Input

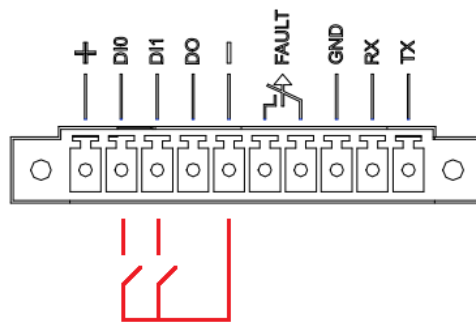


Output Circuit

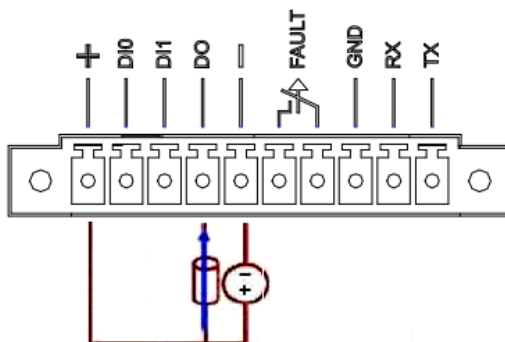
Digital Output



- Digital Input Wiring



- Digital Output Wiring

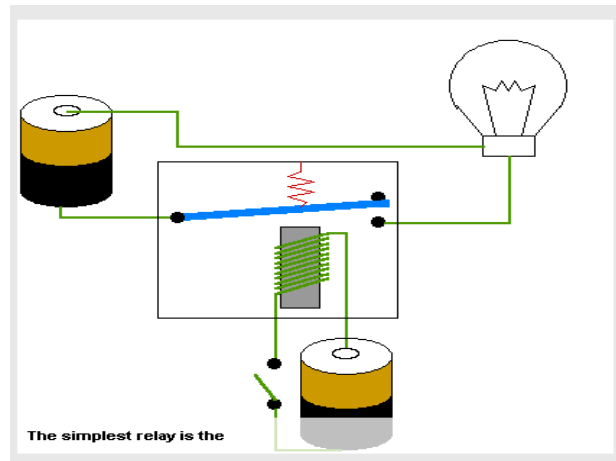


- Relay output with 0.5A @30VDC

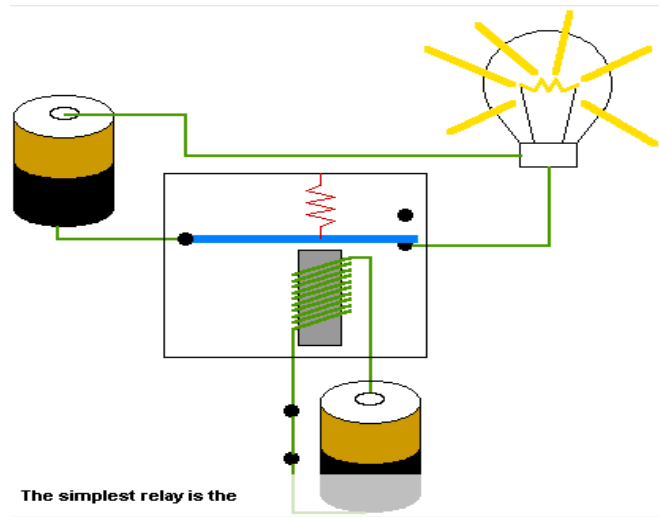
Relay output

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

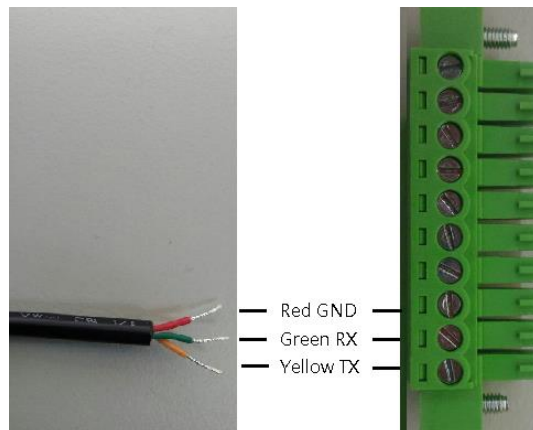
1. Normal



2. Warning



- Console cable pin definition



- DIO Terminal Block

TB10 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 turn ON.</p> <ul style="list-style-type: none"> - The LED is blinking, Bootloader or Linux kernel loading. - The LED always ON, system ready. 	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 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°C ~ +70°C (-40 °F ~ +158°F)

1.2.16 Storage Temperature

- -45°C ~ +85°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 DB9 connectors for I2C and SPI function
- 1 x COM port
- 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 Wet contacts
- DC Powers Input with terminal block
- Relay out

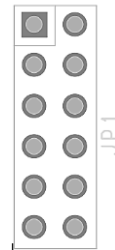
**Note**

All specifications and images are subject to change without notice.

1.3 Jumper setting

1.3.1 JP1

Function	Setting
Copy image to eMMC	JP1 1-2 Close
Boot to OS (IFB125 eMMC) (Default)	JP2 3-4,5-6 Close JP2 7-8, 11-12 Close
Boot to OS (IFB125 SD Card)	JP2 3-4, 9-10 Close



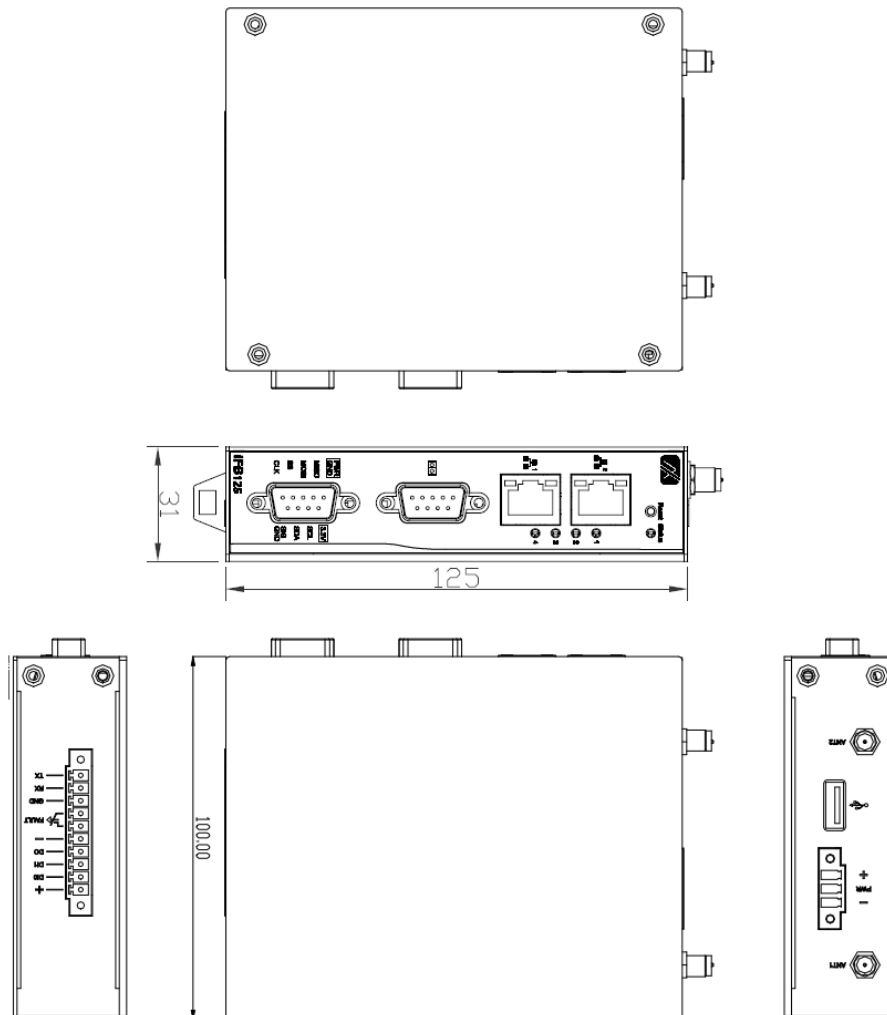
1.3.2 JP3

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



1.4 Dimensions

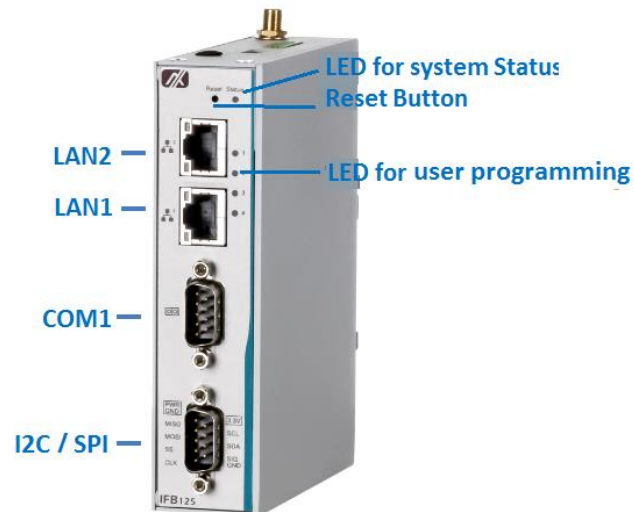
The following diagrams illustrate dimensions and outlines of the IFB125



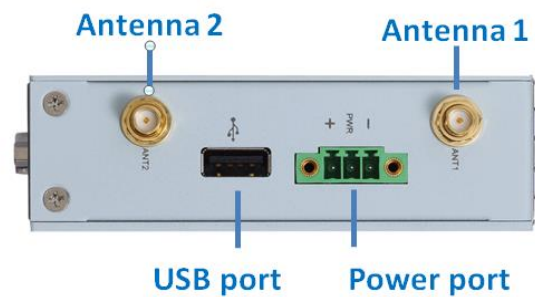
1.5 I/O Outlets

The following figures help you locate I/O outlets on the front top and bottom of the IFB125.

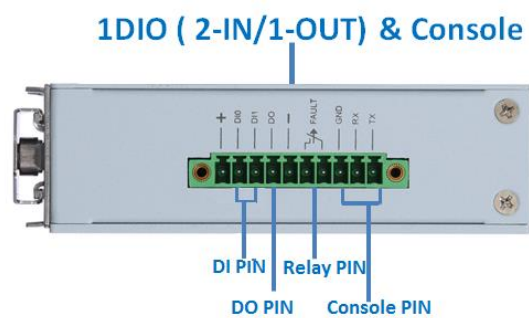
- **Front View**



- **Top View**



- **Bottom View**



1.6 Packing List

The package bundled with your IFB125 should contain the following items:

- IFB125 System Unit x 1
- Din-rail Kit x 1
- Power terminal block x 1
- DIO terminal block x 1
- Console cable x 1

This page is intentionally left blank.

CHAPTER 2

HARDWARE INSTALLATION

2.1 Installing Din-rail Mounting

The IFB125 provides a Din-rail Mount that can be installed as the picture below illustrates:

Note: Prior to installation, make sure you have all of the required DIN Mount assembling components (screws and bracket) ready.



2.2 Installing Wall Mounting (Optional)

The IFB125 provides a Wall Mounting bracket that customers can install as the picture below illustrates:

Note: Prior to installation, make sure you have all of the required wall mount assembling components (screws and bracket) ready.

Attach the bracket to the system and fasten all of the screws firmly.



This page is intentionally left blank.