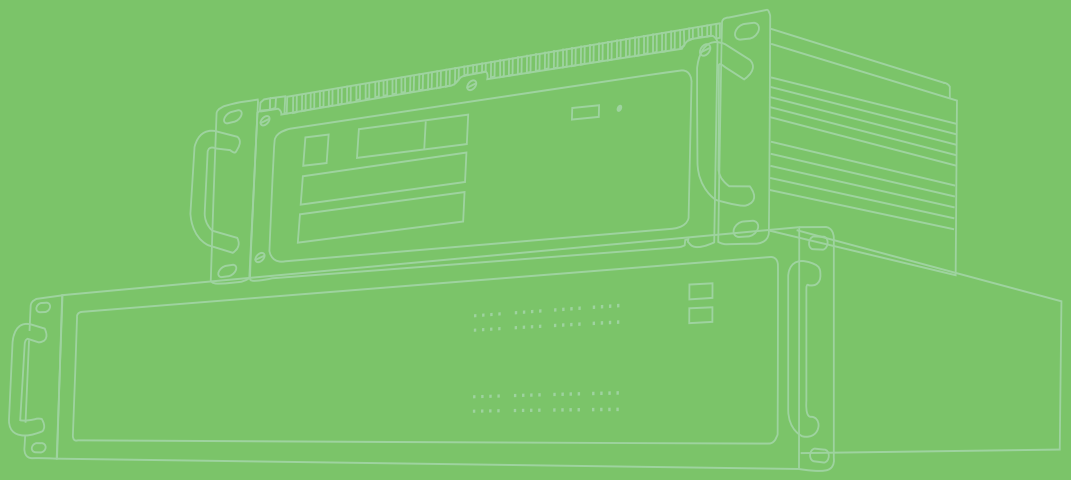

User Manual

ECU-1370

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Acknowledgments

Support

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For technical support and service, please visit our support website at: http://www.advantech.com/support/

Part No. 2003137000 Edition 1

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Product Warranty (2 years)

Advantech warrants the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product is defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This type of cable is available from Advantech. Please contact your local supplier for ordering information.

Test conditions for passing also include the equipment being operated within an industrial enclosure. In order to protect the product from damage caused by electrostatic discharge (ESD) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In this event, users are required to correct the interference at their own expense.

UL

This product has passed the UL test for audio/video, information and communication technology equipment Part 1: Safety requirements.

Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before calling:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If any of the following occurs, have the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated the equipment.
    - The equipment has been exposed to moisture.
    - The equipment is malfunctioning, or does not operate according to the user manual.
    - The equipment has been dropped and damaged.
    - The equipment shows obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -30° C (-22° F) OR ABOVE 70°C (158° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
17. This product is intended to be supplied by an UL certified power supply or dc source with SELV output, rated 10 to 30Vdc, 1.5 to 0.5A minimum and maximum ambient temperature (Tma) 70 degree C minimum without power source or adapter . If you need further assistance, please contact Advantech for further information.
18. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet. The power outlet socket should have a grounded connection.
19. For use in pollution free environments and indoor use.
20. This equipment is not suitable for use in locations where children are likely to be present.

21. If the equipment is used in a manner not specified by the Advantech, the protection provided by the equipment may be impaired.
22. The equipment contains no user-serviceable parts. Do not open, Return to manufacturer for servicing.
23. Do not block air ventilation holes.
24. This is open type equipment and should be installed in a suitable enclosure.

Consignes de sécurité

1. Lire attentivement les instructions de sécurité.
2. Conserver ce manuel pour utilisation ultérieure,
3. Débranchez cet équipement de toute prise secteur avant le nettoyer. Utilisez seulement un chiffon humide. N'utilisez pas de détergent liquide ou pulvérisé pour le nettoyage.
4. Gardez cet équipement à l'abri de l'humidité.
5. Placez cet équipement sur une surface fiable pendant l'installation. Le faire ou bien le laisser tomber peut causer des dégâts.
6. Les ouvertures sur l'enceinte servent à la convection de l'air. Protégez l'équipement contre surchauffe. NE COUVREZ PAS LES OUVERTURES.
7. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à une prise de courant. La prise de courant doit avoir une connexion à la terre.
8. Placez le câble d'alimentation de manière à ce que personne ne puisse marcher dessus. Ne placez rien sur le câble d'alimentation.
9. Toutes les mises en garde et tous les avertissements sur l'équipement doivent être notés.
10. Si l'équipement n'est pas utilisé pendant une longue période, débranchez-le de la source d'alimentation pour éviter tout endommagement dû à une surtension transitoire.
11. Ne jamais verser de liquide dans une ouverture. Cela pourrait provoquer un incendie ou un choc électrique.
12. N'ouvrez jamais l'équipement. Pour des raisons de sécurité, l'équipement doit être ouvert uniquement par du personnel qualifié.
13. Si l'une des situations suivantes se présente, faites vérifier l'équipement par le personnel de service:
    - un liquide a pénétré dans l'équipment. L'équipement a été exposé à l'humidité.
    - L'équipement ne fonctionne pas bien, ou vous ne pouvez pas le faire fonctionner selon le manuel de l'utilisateur.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - L'équipement est tombé et endommagé.
    - L'équipement présente des signes évidents de rupture.
14. NE LAISSEZ PAS CET ÉQUIPEMENT DANS UN ENVIRONNEMENT OU LA TEMPÉRATURE DE STOCKAGE PEUT ĚTRE INFÉRIEURE À -30 ° C (-22 °F) OU BIEN SUPÉRIEURE À 70 ° C (158 ° F). CECI POURRAIT ENDOMMAGER L'ÉQUIPEMENT. L'ÉQUIPEMENT DEVRAIT ĚTRE DANS UN ENVIRONNEMENT CONTRŎLÉ.
15. Ce produit est destiné à être alimenté par une source d'alimentation certifiée UL ou par une source cc convenant à une utilisation à une température minimale de 40 degrés Celsius, dont la sortie est conforme à la norme SELV et dont la puissance nominale est de 10 to 30Vdc, 1.5 to 0.5A en cas de besoin. Tempéra-

ture ambiante maximale (tma) minimum 70 degrés Celsius sans alimentation ni adaptateurcontactez Advant-ech pour plus d'informations.

16. Pour une utilisation dans des environnements non polluant et à l'intérieur.
17. C'est appareil ne doit pas être utilisé dans des endroits où se trouvent des enfants.
18. Si l'équipement est utilisé d'une manière non spécifiée par le fabricant, la protection fournie par l'équipement peut être altéré.
19. L'équipement ne contient aucune pièce réparable par l'utilisateur. Ne pas ouvrir, retourner au fabricant pour réparation.
20. Ne bloquez pas les ou es de ventilation.
21. Il s'agit d'un équipement de type ouvert et doit être installé dans un boîtier approprié.

ATTENTION! *Danger d'explosion si la batterie est mal remplace. Remplacer unique- ment par le meme type ou equivalent recommandé par le fabricant. Jeter les piles usagées selon les instructions du fabricant.*

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from the PC chassis before manual handling. Do not touch any components on the CPU card or other cards while the PC is powered on.
- Disconnect the power before making any configuration changes. A sudden rush of power after connecting a jumper or installing a card may damage sensitive electronic components.

Contents

Chapter 1

Overview

1.1 Introduction

The ECU-1370 is a high-performance IoT gateway based on the i.MX8M platform. Featuring an open design with a Quad-Core processor, it includes three 10/100/1000 Ethernet ports, multiple communication and DIO ports, and an operating temperature range of -40 to 80°C. Running on the Ubuntu 22.04 operating system, the ECU-1370 allows system integrators to develop applications specifically for solar power, electricity generation, and factory settings that require extensive cloud-based data collection. This makes the ECU-1370 an excellent solution for energy storage systems.

1.2 Specifications

1.2.1 General

- **Line Power Input:** 24V_{DC} (10~30V_{DC}/1.5~0.5A), 2-pin screw terminal
- **Reverse Polarity Protection:** YES
- **Power Overvoltage Protection:** 37 V_{DC} within 1sec.
- **Under Voltage Lock Out:** 10.5 V_{DC}
- **Over Voltage Lock Out:** 29 V_{DC}
- **Operating Temperature:** –40°C to 80°C
- **Storage Temperature:** –40°C to 80°C
- **Operating Humidity rating:** 95% non-condensing
- **Protection Class:** IP30
- **Dimensions:** 93mm (D) x 65.7mm(W) x 140mm(H)
- **Mounting:** Din Rail

1.2.2 System

- **CPU:** NXP MIMX8MQ6CVAHZAB (Quad core 1.3G)
- **Memory:** 4GB LPDDR4
- **Storage:** 32GB eMMC
- **USB:** 2 x USB2.0
- **LED:** 1 x PWR, 3 x Programmable,TX1,RX1
- **LAN:** 3 x 10/100/1000 Base-T
- **Watch Dog Timer:** YES
- **RTC:** YES
- **Serial Communication:** 1 x RS-485
  1 x Single-Channel 1-Wire Master
  1 x CANBus (ISO 11898-2)
- **Console Port:** 1 x USB-Type C, 115200bps

1.2.3 Digital Input

- **Channel:** 24
- **Connectors Type:** Terminal blocks
- **Input Filter:** Programmable, Default 3ms
- **Pulse Input Frequency:** 150Hz
- **Wet Contact**
  - Logic level 0: 0~3.3V
  - Logic level 1: 9~26V
- **LED State:** NO

1.2.4 Relay Output

- **Channel:** 6
- **Connectors Type:** Terminal blocks
- **Relay Type:** 4 x Form A, 2 x Form C
- **Contact Rating:** 30 V_{DC} @ 3A
- **Mechanical endurance:** 1 x 10^7 operations
- **Isolation between open contacts:** 750VAC for 1 minute
- **Flyback diode:** YES
- **Relay On Time:** 10 ms
- **Relay Off Time:** 5 ms
- **Insulation Resistance:** 100MΩ min. at 500 V_{DC}
- **LED State:** NO

1.2.5 Ethernet

- **Connectors:** 3 x RJ-45
- **Speed:** 10/100/1000 Base-T
- **LED State:** Green (Link)/Orange or Green (Speed)

1.2.6 RS485

- **Channel:** 1
- **Connectors Type:** Terminal blocks
- **Wiring:** 2-wired (D+, D-, GND)
- **LED State:** TX1/RX1
- **Baud Rate:** 300 bps to 921.6 Kbps

1.2.7 CAN

- **Channel:** 1
- **Connectors Type:** Terminal Blocks
- **Wiring:** 2-wired (CAN+, CAN-, GND)
- **Baud Rate:**
  - High Speed CAN: 40 Kbps to 1 Mbps
  - Low Speed/Fault Tolerant CAN: 40 Kbps to 125 Kbps

1.2.8 1-Wire Master

- **Channel:** 1 (maxim integrated, DS2482-100)
- **Connectors Type:** Terminal Blocks
- **Wiring:** 1-wired
- **Isolation:** YES

1.2.9 Output Voltage

- **Channel:** 1 x 5V_{DC} @ 1W
- **Connectors Type:** Terminal Blocks

1.2.10 Software & Firmware

- **Operation System:** Ubuntu 22.04, Kernel 5.X
- **I/O FW/Driver:** ver: 01010101
- **OTA:** YES

1.2.11 SSH Login User Name & Password

- **User Name:** root
- **Password:** no password (Just press "Enter")

1.2.12 Default IP

Default is DHCP mode and if there's no DHCP server connected, will turn to IP as below.

- **LAN1:** 10.0.0.1
- **LAN2:** 11.0.0.1
- **LAN3:** 12.0.0.1

1.3 Chassis Dimensions

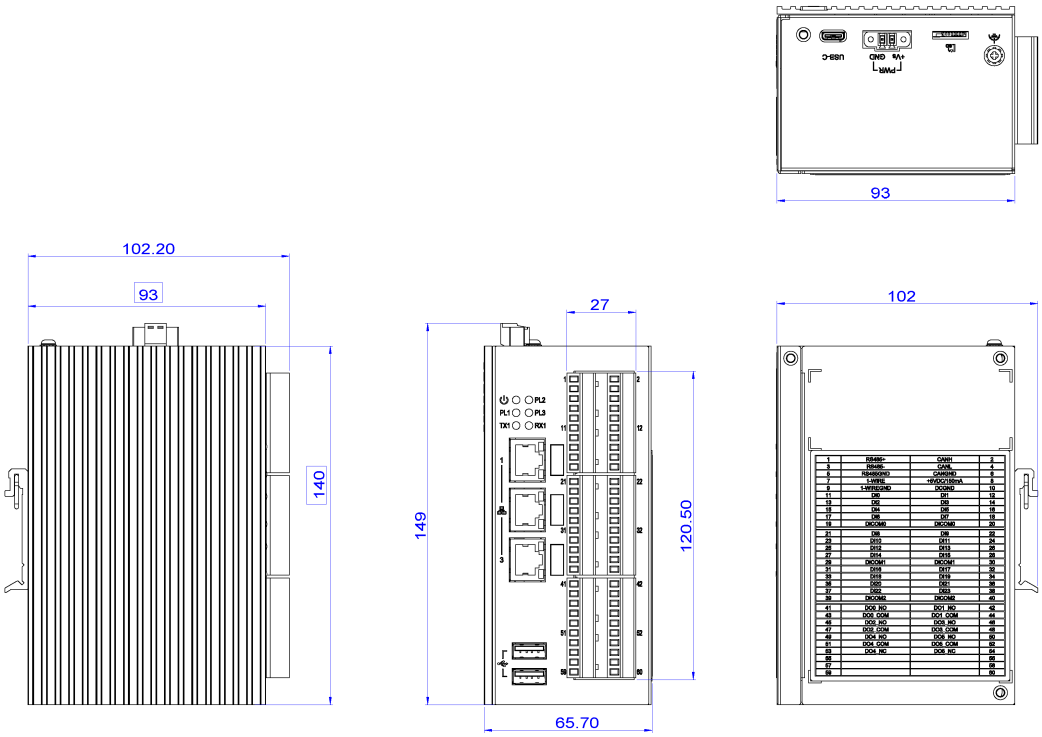


Figure 1.1 ECU-1370 Chassis Dimensions

1.4 Packing List

The accessory package of ECU-1370 contains the following items:

(A) ECU-1370

(B) Connector

(C) Din-rail

Chapter 2

Hardware Functionality

2.1 Overview

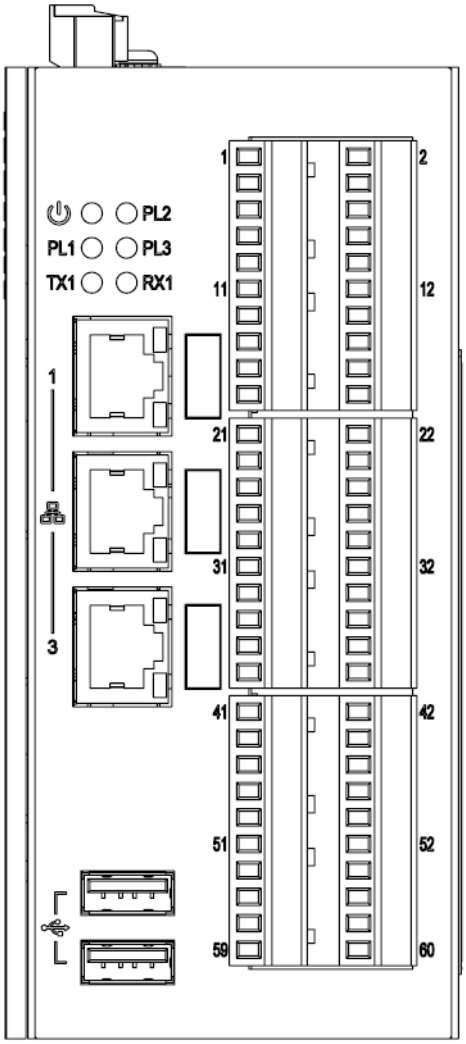


Figure 2.1 ECU-1370 Overview

2.2 LED Status Indicators

2.2.1 System Status Indicators

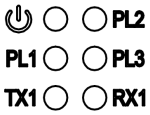


Figure 2.2 System Status Indicator

Table 2.1: System LED Definition

LED	Status	Description
PWR	Green	Power is on
	Off	Power is off
PLX	Green	Customers can define the Programmable LED state according to the application.
	Off	
TX1	Green	RS485 data being transmitted
	Off	No data being transmitted
RX1	Green	RS485 data being received
	Off	No data being received

2.2.2 Ethernet Status Indicator

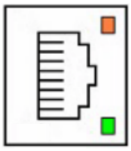


Table 2.2: Ethernet LED Definition

Speed \ LED	Link	Act
No Connection	Off	Off
10 MBit	Off	Green/Blinking
100 MBit	Orange	Green/Blinking
1000 MBit	Green	Green/Blinking

Chapter 3

Wiring and Installation

3.1 Wiring

3.1.1 Power Supply

ECU-1370 supports power input ranging from 10 to 30VDC. The terminal block is suitable for 16-26 AWG, Torque value 3 Lb In. Use copper conductors only. Must be installed by skilled personnel.

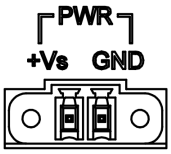


Figure 3.1 Power Supply

Table 3.1: AC/DC Power Input Connector Pin Definition

Function	Pin	Screen Printing	Function Description
Power Input	1	+Vs	PWR V+ DC power input PIN
	2	GND	PWR V- DC power input PIN

3.1.2 Console Port

Figure 3.2 Console Port (USB-C)

3.1.3 USB Ports

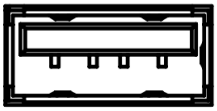


Figure 3.3 USB Ports

Table 3.2: USB Connector Pin Assignment

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

3.1.4 Ethernet Ports

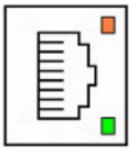


Figure 3.4 LAN Connectors (LAN1~LAN3)

Table 3.3: LAN Connector Pin Assignments

Pin	Description	10Mbit	100Mbit	1000Mbit
1	Transmit Data+ or Bidirectional	TX+	TX+	BI_DA+
2	Transmit Data- or Bidirectional	TX-	TX-	BI_DA-
3	Receive Data+ or Bidirectional	RX+	RX+	BI_DB+
4	Not connected or Bidirectional	N/C	N/C	BI_DC+
5	Not connected or Bidirectional	N/C	N/C	BI_DC-
6	Receive Data- or Bidirectional	RX-	RX-	BI_DB-
7	Not connected or Bidirectional	N/C	N/C	BI_DD+
8	Not connected or Bidirectional	N/C	N/C	BI_DD-

3.1.5 SD Card Slot

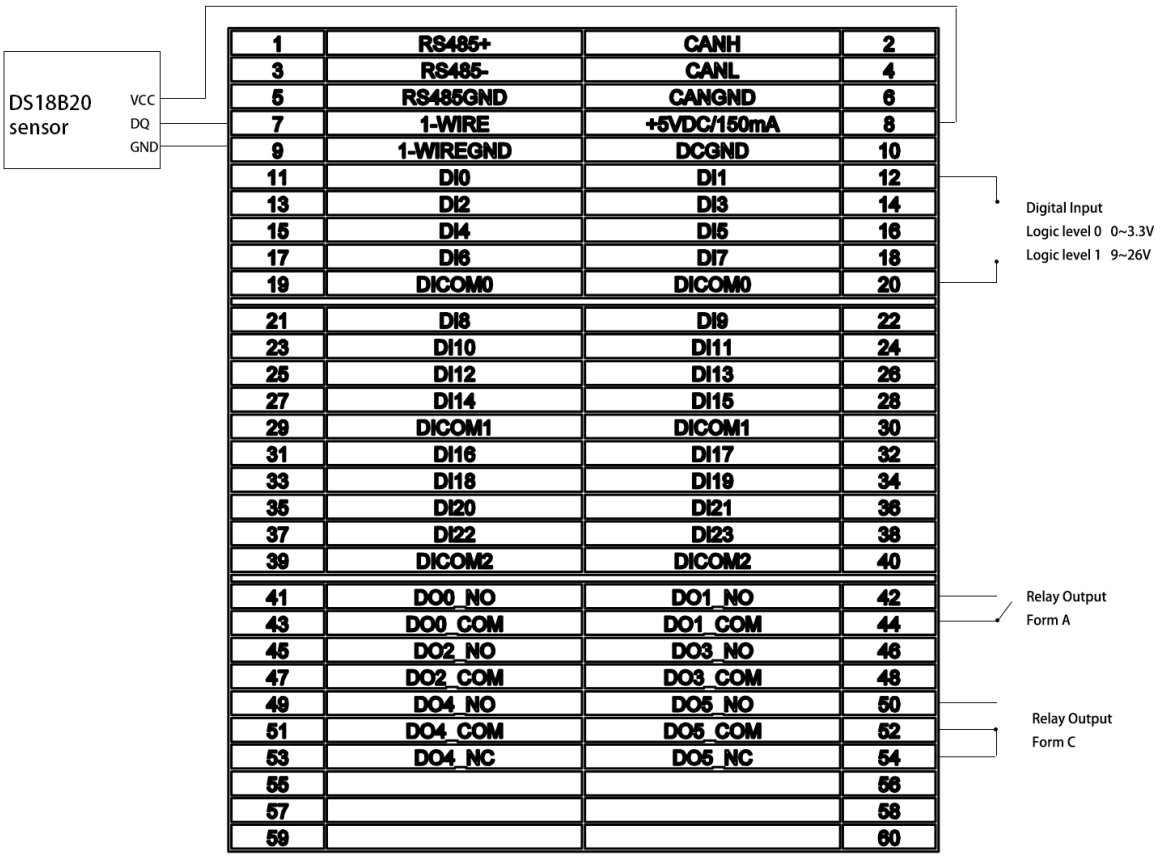
ECU-1370 is equipped with a SD card interface on the top.

Figure 3.5 SD Card Slot

3.1.6 Multi-Functional Ports (Screw Terminal)

Caution! *Pin 41 to Pin 54 only suitable for connecting to PS2 or LPS circuit, less than 100W, according to IEC 62368-1.*

Avertir! *Les broches 41 à 54 ne conviennent que pour la connexion à un circuit PS2 ou LPS, moins de 100 W, selon IEC 62368-1.*



1	RS485+	CANH	2
3	RS485-	CANL	4
5	RS485GND	CANGND	6
7	1-WIRE	+5VDC/150mA	8
9	1-WIREGND	DCGND	10
11	DI0	DI1	12
13	DI2	DI3	14
15	DI4	DI5	16
17	DI6	DI7	18
19	DICOM0	DICOM0	20
21	DI8	DI9	22
23	DI10	DI11	24
25	DI12	DI13	26
27	DI14	DI15	28
29	DICOM1	DICOM1	30
31	DI16	DI17	32
33	DI18	DI19	34
35	DI20	DI21	36
37	DI22	DI23	38
39	DICOM2	DICOM2	40
41	DO0_NO	DO1_NO	42
43	DO0_COM	DO1_COM	44
45	DO2_NO	DO3_NO	46
47	DO2_COM	DO3_COM	48
49	DO4_NO	DO5_NO	50
51	DO4_COM	DO5_COM	52
53	DO4_NC	DO5_NC	54
55			56
57			58
59			60

Figure 3.6 Multi-Functional Ports

3.2 Switch and Jumper Setting

3.2.1 Motherboard SW2 Setting

The motherboard of ECU-1370 has a switch to select boot device.

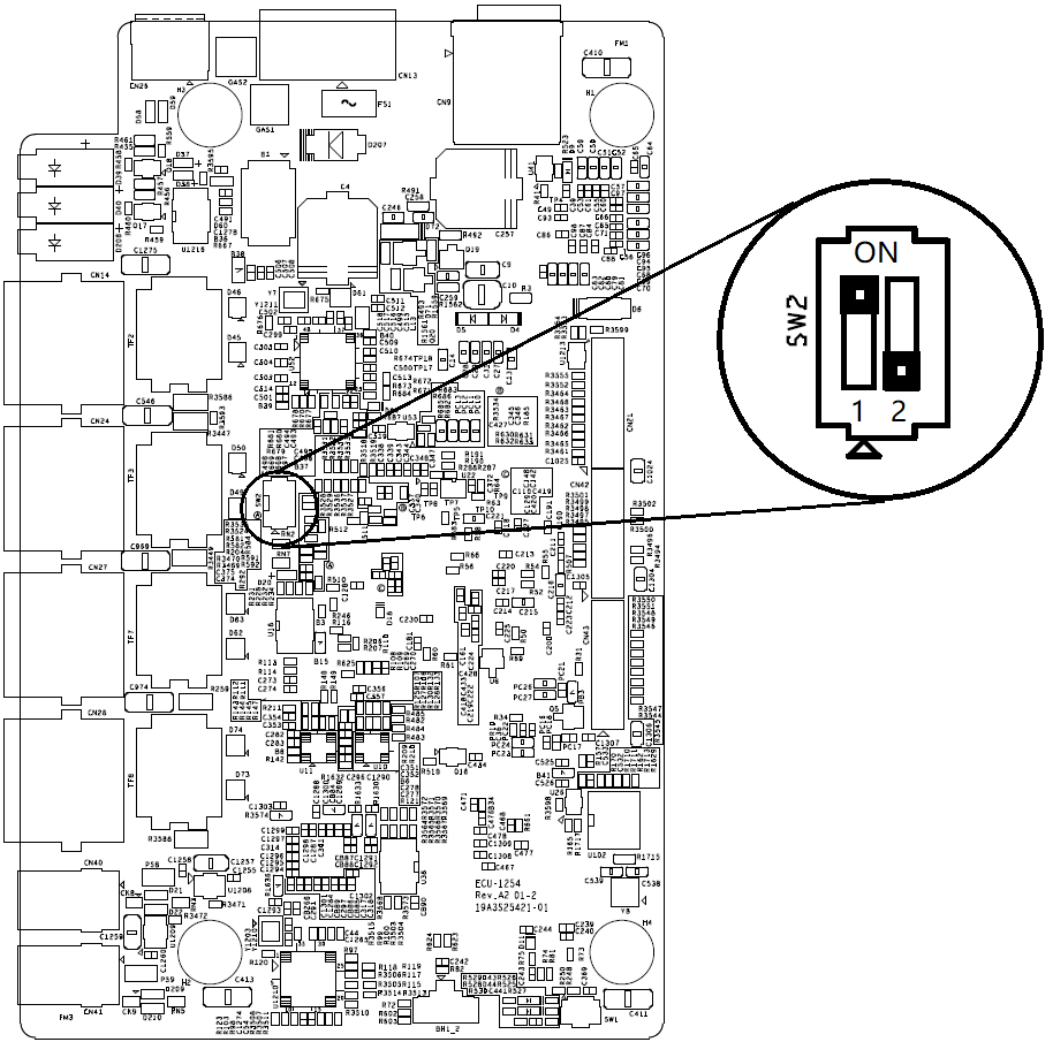


Figure 3.7 Motherboard Switch 2 Setting

Table 3.4: Motherboard SW2 Setting

Function	Pin	Function Description
Boot mode	1 ON 2 OFF	Boot from eMMC (Default)
	1 OFF 2 ON	Boot from SD card

3.2.2 IOboard Jumper Setting

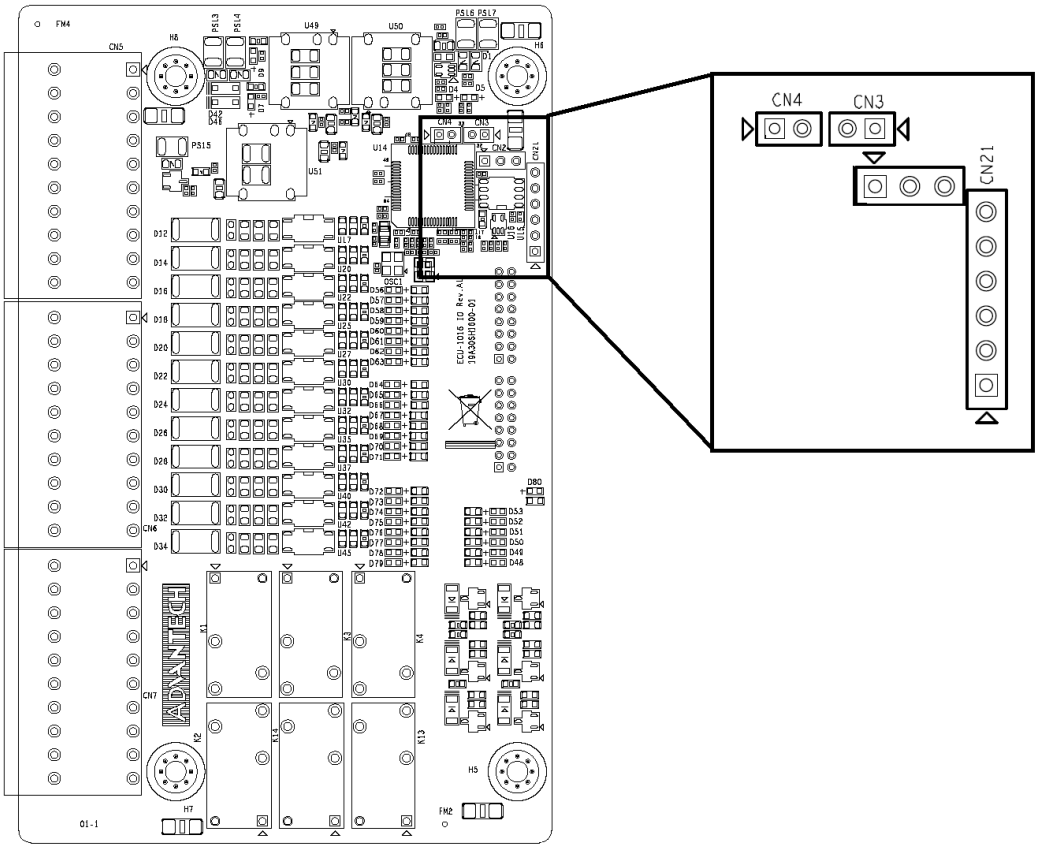


Figure 3.8 IOboard Jumper Setting

Table 3.5: IOboard Jumper Setting

Function	Pin	Function Description
Console port	CN2	OFF (Default)
Watch Dog	CN3	ON (Default)
Download FW	CN4	OFF (Default)
Download FW (Debug)	CN21	OFF (Default)

3.3 Installation

3.3.1 DIN-Rail Installation

ECU-1370 supports DIN-Rail installation. The detailed steps are shown as below:

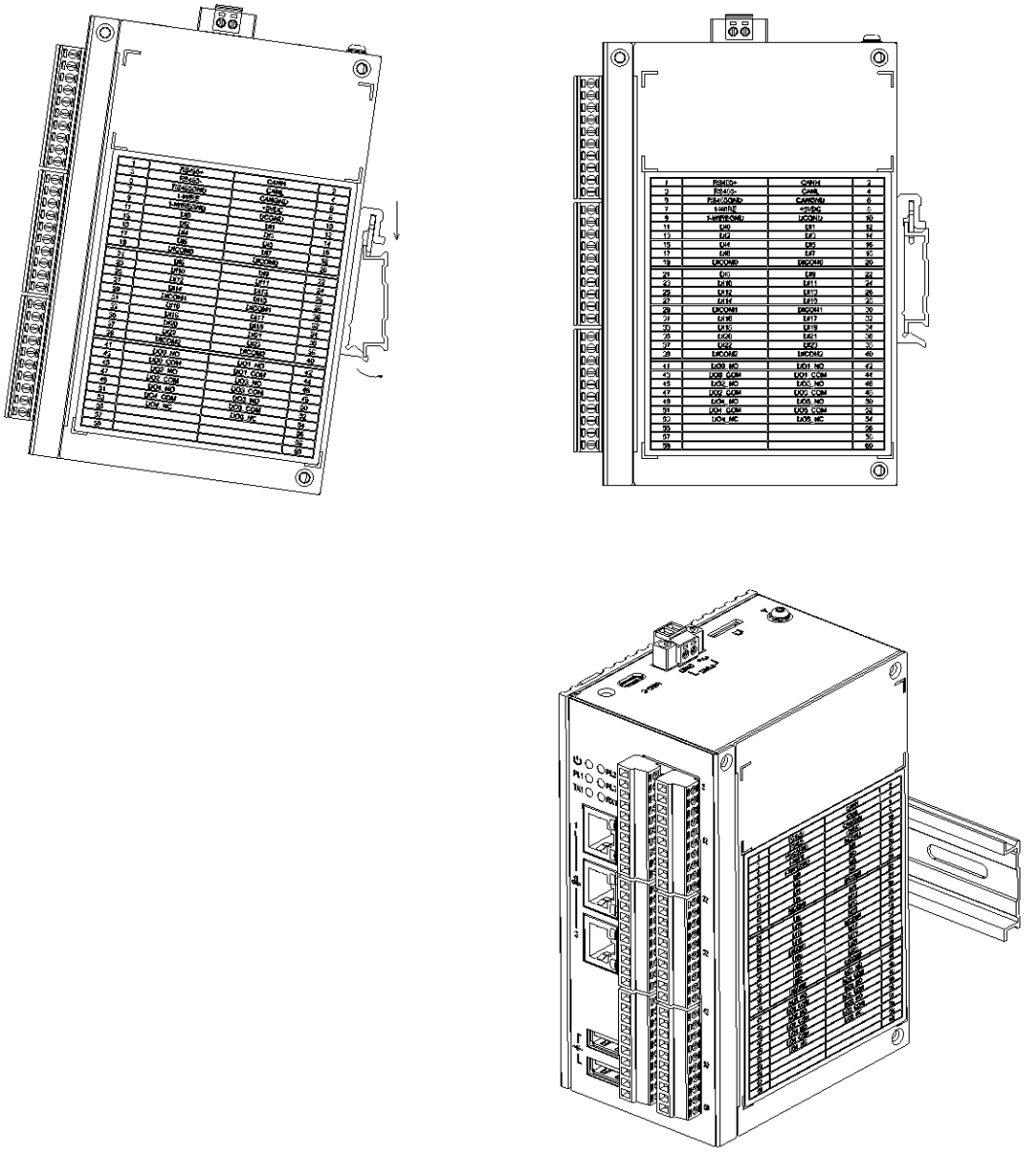


Figure 3.9 Vertical DIN-Rail Bracket Installation

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