

# AIOT-MSSP01

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Mini SSP Vending Control Board

User's Manual 2<sup>nd</sup> Ed

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## Packing List

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Before setting up your product, please make sure the following items have been shipped:

| Item                     | Quantity |
|--------------------------|----------|
| ● AIOT-MSSP01            | 1        |
| ● User's Manual (in pdf) | 1        |

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

## About this Document

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This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the [AAEON.com](http://AAEON.com) for the latest version of this document.

## Safety Precautions

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Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
  - i. Damaged power cord or plug
  - ii. Liquid intrusion to the device
  - iii. Exposure to moisture
  - iv. Device is not working as expected or in a manner as described in this manual
  - v. The device is dropped or damaged
  - vi. Any obvious signs of damage displayed on the device
18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

## FCC Statement

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### **Warning!**



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

### **Caution:**

*There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.*

### **Attention:**

*Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.*



## China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

| 部件名称   | 有毒有害物质或元素 |           |           |                 |               |                 |
|--|-----------|-----------|-----------|-----------------|---------------|-----------------|
|  | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 印刷电路板<br>及其电子组件  | ○         | ○         | ○         | ○               | ○             | ○               |
| 外部信号<br>连接器及线材   | ○         | ○         | ○         | ○               | ○             | ○               |
| <p>○：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。</p> |           |           |           |                 |               |                 |

## China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

| Component   | Poisonous or Hazardous Substances or Elements |              |              |                              |                                |                                       |
|---|---|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|
|   | Lead (Pb)                                     | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| PCB & Other Components  | ○   | ○            | ○            | ○                            | ○                              | ○                                     |
| Wires & Connectors for External Connections   | ○   | ○            | ○            | ○                            | ○                              | ○                                     |
| <p>O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p><b>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</b></p> |   |              |              |                              |                                |                                       |

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# Chapter 1

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Product Specifications

## 1.1 Specifications

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### External Connector

- **USB** USB 2.0 type A connector x 5 (via USB HUB)  
Micro USB 2.0 type B connector x 1 (USB HUB Host)

### Internal Connector

- **MDB** MDB x 1
- **1-Wire** 1-WIRE x 1
- **DEX** DEX x 1
- **Protocol A** Protocol A (EXE) x 1
- **Keypad** 8 Bit Keypad x 1
- **LCD** LCD x 1
- **ADC** 4-channel ADC x 1
- **Relay GPIO** 4-channel Relay GPIO for 12V & 5V by switch x 1
- **GPIO** 16 Bit GPIO x 2
- **24V GPI** 8 Bit 24V GPI x 1
- **24V Analog voltage sense** 24V Analog voltage sense x 1
- **Power input** 24VAC/DC Power Input
- **Motor Switch** Select motor 24Vdc or 12Vdc switch (Motor supports GPIO, DC, PWM type) x 1
- **Full bridge motor** Full bridge motor control x 5
- **Low side motor** Low side motor control x 16
- **Expansion header** 2\* 20 PIN header x 2

## Others

- **Form Factor** 150 mm x 140 mm
- **Power Source** 24V AC @ 50Hz, 24vDC
- **Operating Temperature** 0°C ~ 60°C
- **Operating Humidity** 0% ~ 90% relative humidity, non-condensing
- **Certification** CE, FCC

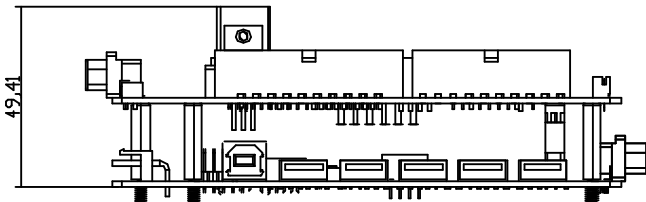
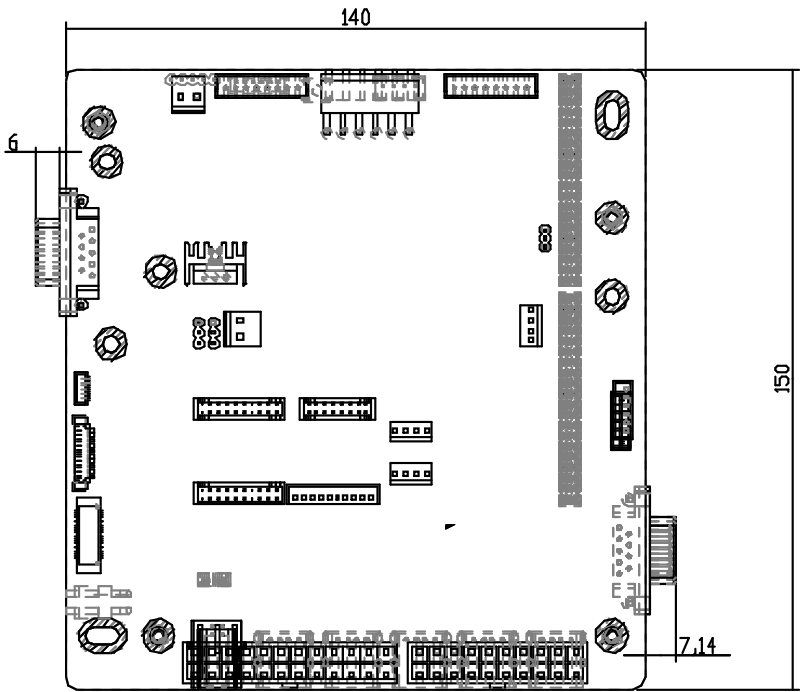


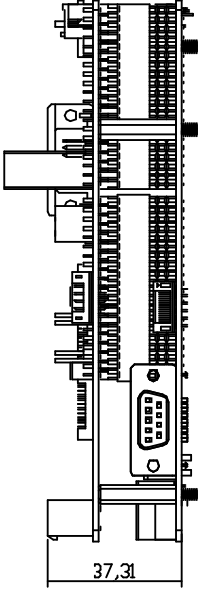
# Chapter 2

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Hardware Information

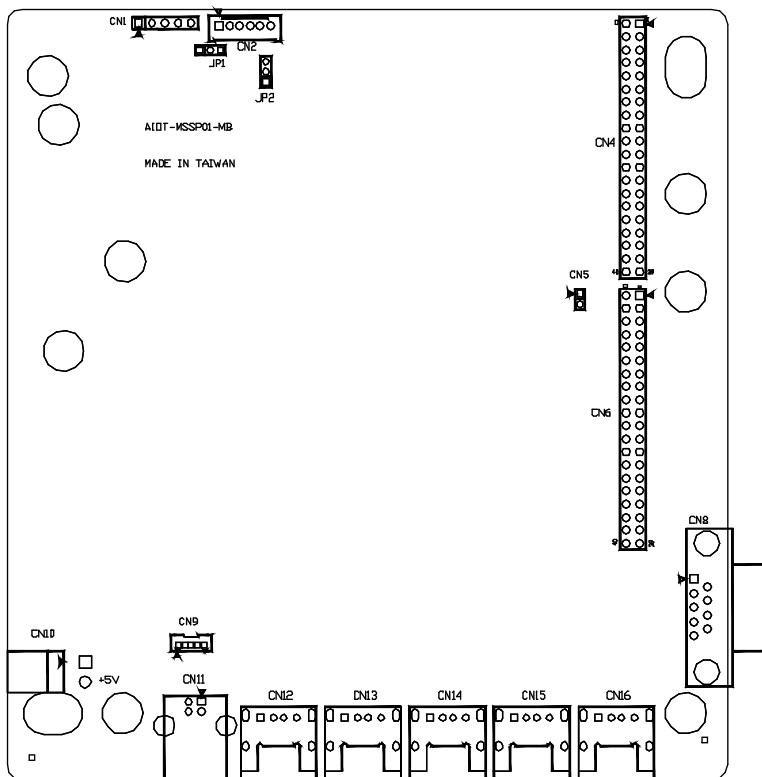
## 2.1 Dimensions



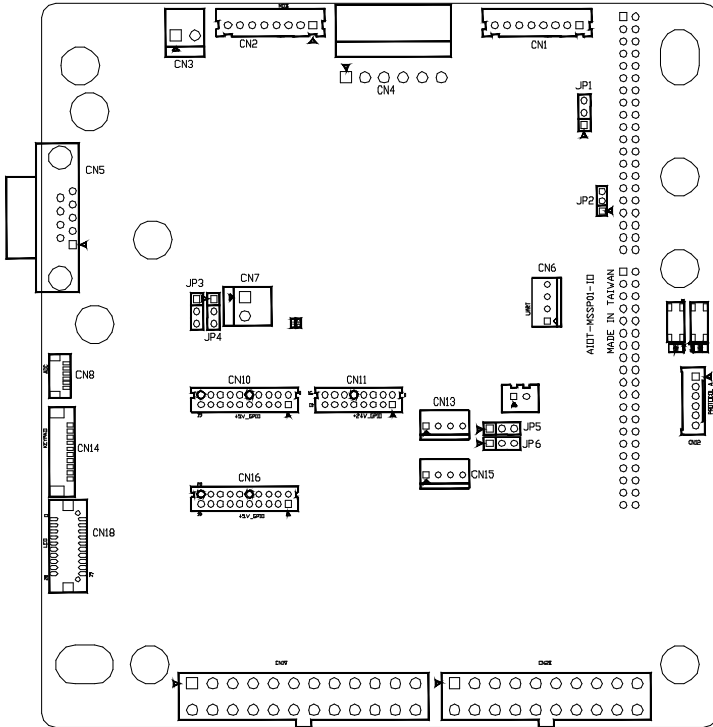


## 2.2 Jumpers and Connectors

### 2.2.1 Main board layout



## 2.2.1 I/O board layout



## 2.3 List of Connectors

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Please refer to the table below for all of the board's connectors that you can configure for your application

### 2.3.1 Mainboard Connector Index

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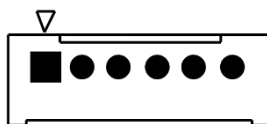
| Reference | Function               | Connector Type                            |
|-----------|------------------------|---|
| CN1       | MCU-ICSP               | (TF)PIN HEADER.5*1P:180D.(M).2.54mm.DIP   |
| CN2       | Vending detect         | (TF)WAFER BOX.6P:180D(M).DIP.2.0mm.w/LOCK |
| CN4 CN6   | IO BOARD<br>CONNECTORS | (TF)PIN HEADER.20*2P:180D(M).DIP.2.54mm   |
| CN8       | RS232                  | (TF)D-SUB CONNECTOR.9P:90D                |
| CN9       | Internal USB2.0        | (TF)WAFER BOX.5P:180D(M).DIP.1.25mm       |
| CN10      | +5V output             | (TF)WAFER.2P:180D(M).3.96mm.W/LOCK        |
| CN12 CN13 | External               | (TF)USB2.0 Connector.4P:90D(F).DIP        |
| CN14 CN15 | USB2.0                 |   |
| CN16      |                        |   |

### 2.3.1.1 MCU-ICSP (CN1)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | MCLR#              | 2   | +3.3V              |
| 3   | GND                | 4   | PGED1              |
| 5   | PGED1              |     |                    |

### 2.3.1.2 Vending Detect (CN2)

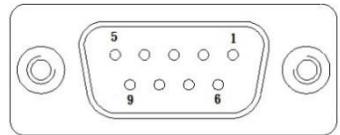


| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | VEND_DET_IN        | 2   | GND                |
| 3   | VEND_DET_ALARM     | 4   | NC                 |
| 5   | GND                | 6   | VEND_DETECT_VCC    |



| Vending Detection /Vending Detection Power |        |         |
|--|--------|---------|
| 1-2  | MVC600 | Default |
| 2-3  | CST539 |         |

### 2.3.1.3 RS-232 (CN8)

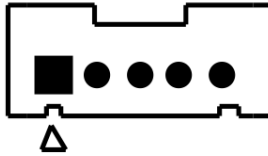


| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | N/A                | 2   | RS232_RXD          |
| 3   | RS232_TXD          | 4   | N/A                |
| 5   | GND                | 6   | N/A                |
| 7   | N/A                | 8   | N/A                |
| 9   | N/A                |     |                    |



### 2.3.1.4 USB2.0 (CN9)

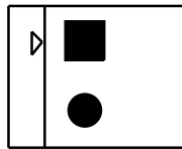
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| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | 5V                 | 2   | D-                 |
| 3   | D+                 | 4   | GND                |
| 5   | GND                |     |                    |

### 2.3.1.5 5V supply (CN10)

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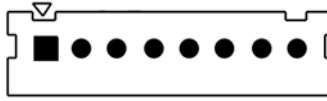
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | 5V                 | 2   | GBD                |

## 2.3.2 I/O board Connector Index

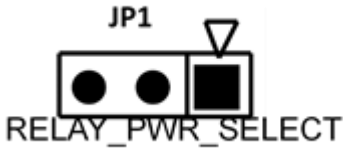
| Reference | Function                | Connector Type                               |
|-----------|-------------------------|--|
| CN1       | Relay GPIO              | (TF)WAFER BOX.8P:180D(M).DIP2.5mm.W/LOCK     |
| CN2       | MDB                     | (TF)WAFER BOX.8P:180D(M).DIP2.5mm.W/LOCK     |
| CN3       | +12V output             | (TF)WAFER.2P:180D(M).3.96mm.W/LOCK           |
| CN4       | POWER<br>INPUT          | (TF) WAFER.6*1P:90D.(M).3.96mm.w/ Lock       |
| CN5       | RS232                   | (TF)D-SUB CONNECTOR.9P:90D                   |
| CN6       | UART                    | (TF)WAFER.4P:180D.(M).2.5mm.W/LOCK POWER DIP |
| CN7       | +24V output             | (TF)WAFER.2P:180D(M).3.96mm.W/LOCK           |
| CN8       | ADC                     | (TF)Wafer Box.6P:180D.(M).SMD.1.0mm.w/ CAP   |
| CN9       | 24V ANALOG<br>INPUT     | (TF)WAFER BOX.2P:180D.(M).2.5mm.W/LOCK DIP   |
| CN10 CN16 | 16 Bit GPIO             | (TF)WAFER BOX.10*2P:180D.(M).DIP2.0mm.W/LOCK |
| CN11      | 24V<br>VENDING<br>INPUT | (TF)WAFER BOX.8*2P:180D.(M).DIP2.0mm.W/LOCK  |
| CN12      | PROTOCOL A              | (TF)WAFER BOX.6P:180D(M).DIP2.0mm.w/LOCK     |
| CN13      | DEX<br>INTERFACE        | (TF)WAFER.4P:180D.(M).2.5mm.W/LOCK POWER DIP |
| CN14      | Keypad                  | (TF)WAFER BOX.10P:180D(M).SMD.1.25mm         |
| CN15      | 1-WIRE<br>INTERFACE     | (TF)WAFER.4P:180D.(M).2.5mm.W/LOCK POWER DIP |

|             |            |  |
|-------------|------------|--|
| <b>CN18</b> | LCD        | (TF)Board-Wire<br>Connector:20P:180D(M).SMD.Pitch=1.25mm.W/Reinfor<br>em |
| <b>CN19</b> | FULL MOTOR | (TF)ATX POWER CONNECTOR.12P*2.180D(M)                                    |
| <b>CN20</b> | HALF MOTOR | (TF)ATX POWER CONNECTOR.10P*2.180D.DIP                                   |

### 2.3.2.1 Relay GPO (CN1)

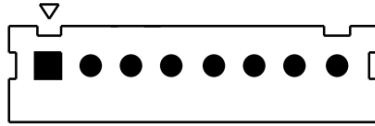


| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | DO_0               | 2   | DO_1               |
| 3   | DO_2               | 4   | DO_3               |
| 5   | RELAY_PWR          | 6   | RELAY_PWR          |
| 7   | RELAY_PWR          | 8   | RELAY_PWR          |



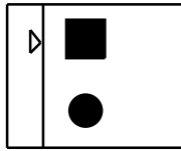
| RELAY POWER MODE SELECTION |     |         |
|----------------------------|-----|---------|
| 1-2                        | +5V | Default |
| 2-3                        | +12 |         |

### 2.3.2.2 MDB Master (CN2)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | MDB_SUPPLY         | 2   | EXT_24V_RTN        |
| 3   | NC                 | 4   | MDB_RX             |
| 5   | MDB_TX             | 6   | GND                |
| 7   | GND                | 8   | GND                |

### 2.3.2.3 +12V Supply (CN3)



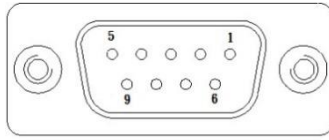
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | 12V                | 2   | GND                |

### 2.3.2.4 Power Input (CN4)



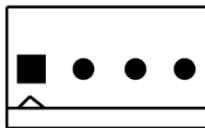
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | MDB_SUPPLY         | 2   | EXT_24V_RTN        |
| 3   | NA                 | 4   | MDB_RX             |
| 5   | MDB_TX             | 6   | GND                |

### 2.3.2.5 RS232 (CN5)



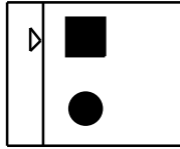
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | N/A                | 2   | RS232_RXD          |
| 3   | RS232_TXD          | 4   | N/A                |
| 5   | GND                | 6   | N/A                |
| 7   | N/A                | 8   | N/A                |
| 9   | N/A                |     |                    |

### 2.3.2.6 UART (CN6)

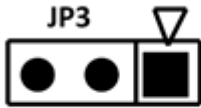


| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | +3.3V              | 2   | UART_TXD           |
| 3   | UART_RXD           | 4   | GND                |

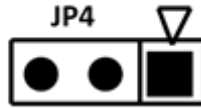
### 2.3.2.7 +24V Output (CN7)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | MOTOR_PWR          | 2   | GND                |



MOTOR POWER MODE SELECTION



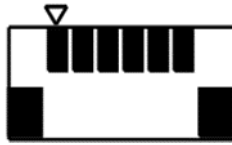
MOTOR POWER MODE SELECTION

| MOTOR POWER MODE SELECTION |     |         |
|----------------------------|-----|---------|
| 1-2                        | PWM | Default |
| 2-3                        | DC  |         |

| MOTOR POWER SELECTION |     |         |
|-----------------------|-----|---------|
| 1-2                   | 12V | Default |
| 2-3                   | 24V |         |

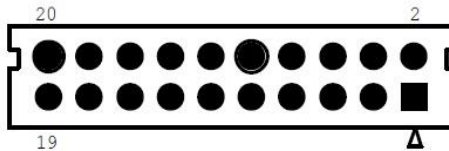


### 2.3.2.8 ADC (CN8)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | ANALOG_IN1         | 2   | ANALOG_IN2         |
| 3   | GND                | 4   | GND                |
| 5   | ANALOG_IN3         | 6   | ANALOG_IN4         |

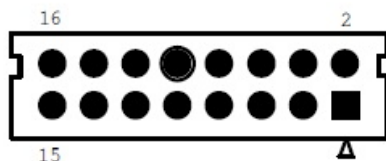
### 2.3.2.9 16 Bit GPIO (CN10)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | 5V_CON_GPI1        | 2   | 5V_CON_GPIO1       |
| 3   | 5V_CON_GPI2        | 4   | 5V_CON_GPIO2       |
| 5   | 5V_CON_GPI3        | 6   | 5V_CON_GPIO3       |
| 7   | 5V_CON_GPI4        | 8   | 5V_CON_GPIO4       |

|    |             |    |              |
|----|-------------|----|--------------|
| 9  | 5V_CON_GPI5 | 10 | 5V_CON_GPIO5 |
| 11 | 5V_CON_GPI6 | 12 | 5V_CON_GPIO6 |
| 13 | 5V_CON_GPI7 | 14 | 5V_CON_GPIO7 |
| 15 | 5V_CON_GPI8 | 16 | 5V_CON_GPIO8 |
| 17 | GND         | 18 | GND          |
| 19 | GND         | 20 | GND          |

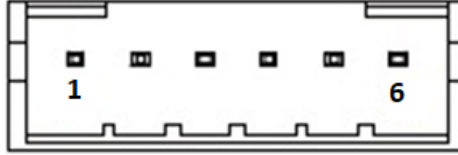
### 2.3.2.10 24V Vending Input (CN11)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | 24V_GPI1           | 2   | 24VIO_RTN_OPTO     |
| 3   | 24V_GPI2           | 4   | 24VIO_RTN_OPTO     |
| 5   | 24V_GPI3           | 6   | 24VIO_RTN_OPTO     |
| 7   | 24V_GPI4           | 8   | 24VIO_RTN_OPTO     |
| 9   | 24V_GPI5           | 10  | 24VIO_RTN          |
| 11  | 24V_GPI6           | 12  | 24VIO_RTN          |
| 13  | 24V_GPI7           | 14  | 24VIO_RTN          |

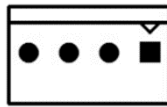
|    |          |    |           |
|----|----------|----|-----------|
| 15 | 24V_GPI8 | 16 | 24VIO_RTN |
|----|----------|----|-----------|

### 2.3.2.11 Protocol A (CN12)



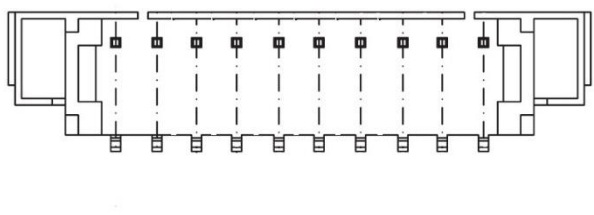
| Pin | Signal Description  | Pin | Signal Description  |
|-----|---------------------|-----|---------------------|
| 1   | MDBSLAVE_EXE_TX+_5V | 2   | MDBSLAVE_EXE_TX-_5V |
| 3   | MDBSLAVE_EXE_RX+_5V | 4   | MDBSLAVE_EXE_RX-_5V |
| 5   | PWR_IN_AC           | 6   | GND                 |

### 2.3.2.12 DEX INTERFACE (CN13)



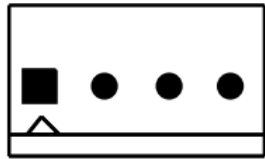
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | DEX_DET            | 2   | GND                |
| 3   | DEX_DOUT           | 4   | DEX_RIN            |

### 2.3.2.13 Keypad (CN14)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | 5V                 | 2   | KEYPAD_0           |
| 3   | KEYPAD_1           | 4   | KEYPAD_2           |
| 5   | KEYPAD_3           | 6   | KEYPAD_4           |
| 7   | KEYPAD_5           | 8   | KEYPAD_6           |
| 9   | KEYPAD_7           | 10  | GND                |

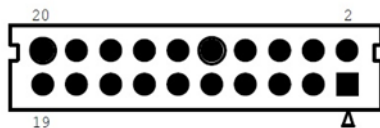
### 2.3.2.14 One Wire (CN15)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | +3.3V              | 2   | 1-Wire DEVICE      |

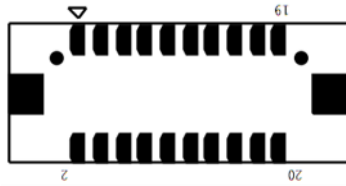
|   |     |   |     |
|---|-----|---|-----|
| 3 | GND | 4 | GND |
|---|-----|---|-----|

### 2.3.2.15 16 Bit GPIO (CN16)



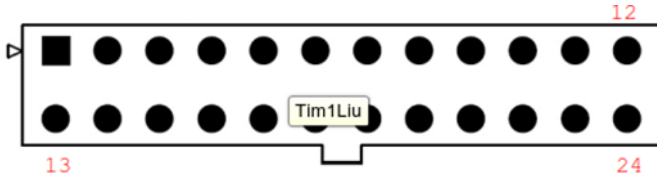
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | 5V_HDR_GPI1        | 2   | 5V_HDR_GPIO1       |
| 3   | 5V_HDR_GPI2        | 4   | 5V_HDR_GPIO2       |
| 5   | 5V_HDR_GPI3        | 6   | 5V_HDR_GPIO3       |
| 7   | 5V_HDR_GPI4        | 8   | 5V_HDR_GPIO4       |
| 9   | 5V_HDR_GPI5        | 10  | 5V_HDR_GPIO5       |
| 11  | 5V_HDR_GPI6        | 12  | 5V_HDR_GPIO6       |
| 13  | 5V_HDR_GPI7        | 14  | 5V_HDR_GPIO7       |
| 15  | 5V_HDR_GPI8        | 16  | 5V_HDR_GPIO8       |
| 17  | GND                | 18  | GND                |
| 19  | GND                | 20  | GND                |

### 2.3.2.16 LCD (CN18)



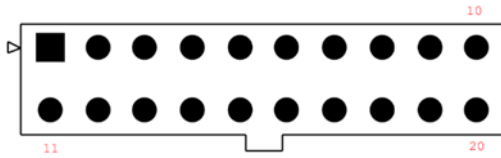
| Pin | Signal Description    | Pin | Signal Description |
|-----|-----------------------|-----|--------------------|
| 1   | GND                   | 2   | 5V                 |
| 3   | 5V(Variable Resistor) | 4   | DISPLAY_RS         |
| 5   | DISPLAY_R/W           | 6   | DISPLAY_EN         |
| 7   | LCD_CN_0              | 8   | LCD_CN_1           |
| 9   | LCD_CN_2              | 10  | LCD_CN_3           |
| 11  | LCD_CN_4              | 12  | LCD_CN_5           |
| 13  | LCD_CN_6              | 14  | LCD_CN_7           |
| 15  | NA                    | 16  | GND                |
| 17  | NA                    | 18  | NA                 |
| 19  | NA                    | 20  | NA                 |

### 2.3.2.16 Full bridge motor (CN19)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | MOTOR_RTN          | 2   | FULL_BRIDGE_1_BR   |
| 3   | FULL_BRIDGE_1_TR   | 4   | FULL_BRIDGE_2_BR   |
| 5   | FULL_BRIDGE_2_TR   | 6   | FULL_BRIDGE_3_BR   |
| 7   | MOTOR_RTN          | 8   | FULL_BRIDGE_3_TR   |
| 9   | FULL_BRIDGE_4_BR   | 10  | FULL_BRIDGE_4_TR   |
| 11  | FULL_BRIDGE_5_BR   | 12  | FULL_BRIDGE_5_TR   |
| 13  | MOTOR_VOLTAGE      | 14  | FULL_BRIDGE_1_TL   |
| 15  | FULL_BRIDGE_1_BL   | 16  | FULL_BRIDGE_2_TL   |
| 17  | FULL_BRIDGE_2_BL   | 18  | FULL_BRIDGE_3_TL   |
| 19  | MOTOR_VOLTAGE      | 20  | FULL_BRIDGE_3_BL   |
| 21  | FULL_BRIDGE_4_TL   | 22  | FULL_BRIDGE_4_BL   |
| 23  | FULL_BRIDGE_5_TL   | 24  | FULL_BRIDGE_5_BL   |

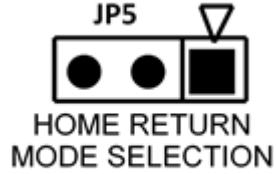
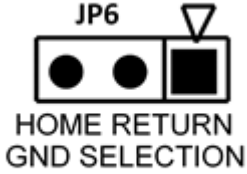
### 2.3.2.17 Low side motor (CN20)



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | LOWSIDE1_M-1       | 2   | LOWSIDE1_M-2       |
| 3   | LOWSIDE1_M-3       | 4   | LOWSIDE1_M-4       |
| 5   | LOWSIDE1_M-5       | 6   | LOWSIDE1_M-6       |
| 7   | LOWSIDE1_M-7       | 8   | LOWSIDE1_M-8       |
| 9   | MOTOR_RTN          | 10  | MOTOR_RTN          |
| 11  | LOWSIDE2_M-1       | 12  | LOWSIDE2_M-2       |
| 13  | LOWSIDE2_M-3       | 14  | LOWSIDE2_M-4       |
| 15  | LOWSIDE2_M-5       | 16  | LOWSIDE2_M-6       |
| 17  | LOWSIDE2_M-7       | 18  | LOWSIDE2_M-8       |
| 19  | MOTOR_RTN          | 20  | MOTOR_RTN          |
| 21  | MOTOR_RTN          |     |                    |



### 2.3.2.18 Home sense (JP5 JP6)



| HOME POSITION MODE SELECTION |     |         |
|------------------------------|-----|---------|
| 1-2                          | DC  |         |
| 2-3                          | PWM | Default |

| MOTOR RETURN GND SELECTION |     |         |
|----------------------------|-----|---------|
| 1-2                        | DC  |         |
| 2-3                        | PWM | Default |

# Chapter 3

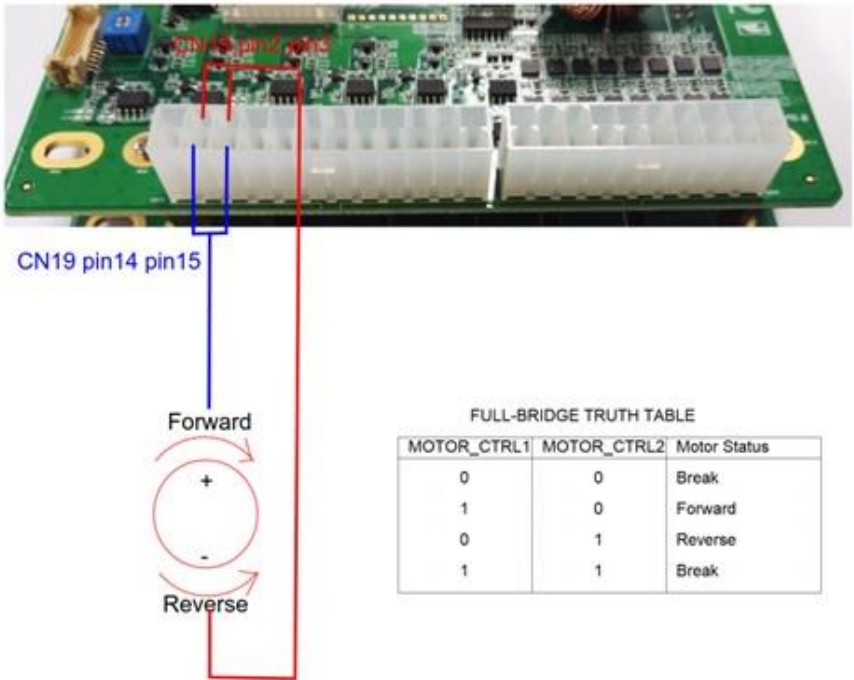
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Motor Setup

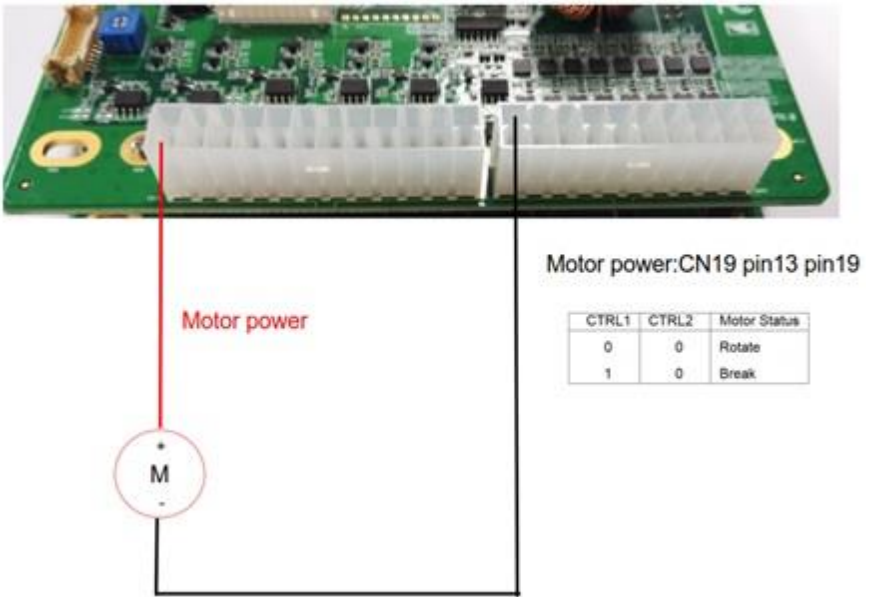
### 3.1 Introduction

The AIOT-MSSP01 supports four types of motor configurations. Please refer to the following motor configuration setting information.

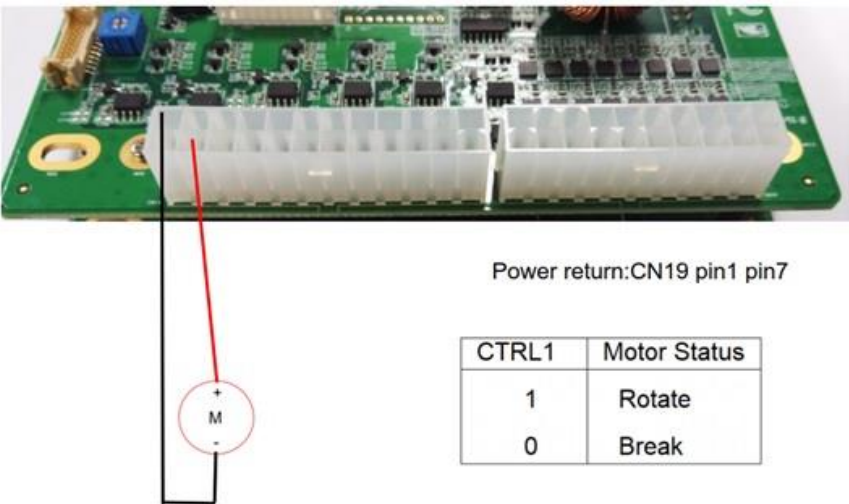
### 3.2 Full Bridge Motor Configuration



### 3.3 Low Side Motor Configuration



### 3.4 High Side Motor Configuration

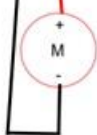


### 3.4 Half Motor Configuration



CN19 pin 2

CN19 pin 14



| CTRL1 | CTRL2 | Motor Status |
|-------|-------|--------------|
| 0     | 0     | Break        |
| 1     | 0     | Rotate       |

# Chapter 4

---

Installation Guide

## 4.1 Firmware Installation

---

Please follow the steps below to install/update firmware.

### 4.1.1 Prerequisites

---

1. Install software – MPLAB IPE. To download, use the following link:  
<http://microchip.wikidot.com/ipe:installation>
2. Install toolchain – MPLABX-v3.45-windows-installer

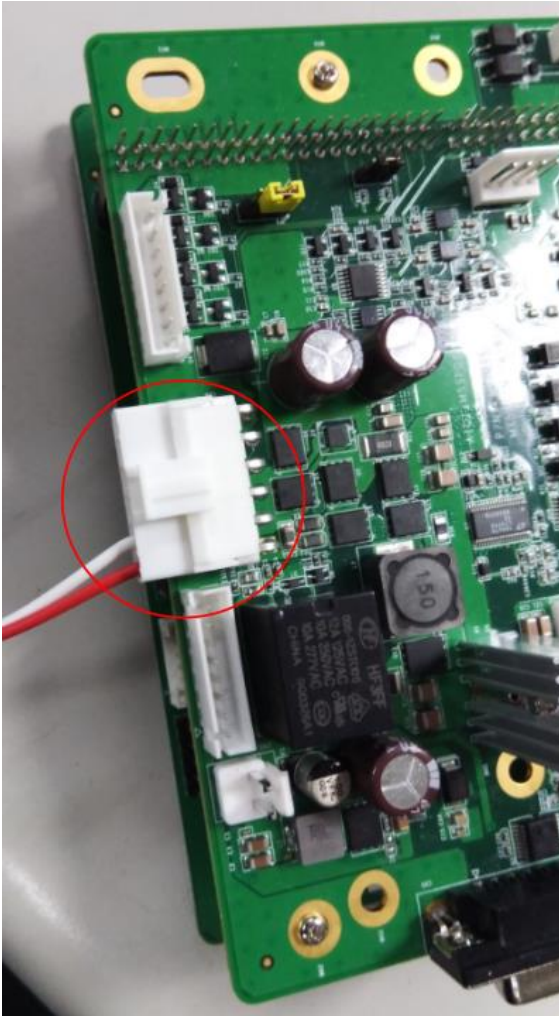
### 4.1.2 Program Boot-loader

---

**Step 1:** Connect ICD 3 to the target board and apply power to the board.



**Step 2:** Connect ICD3 device with the board and then plug in power





**Step 3:** Launch MPLAB IPE application



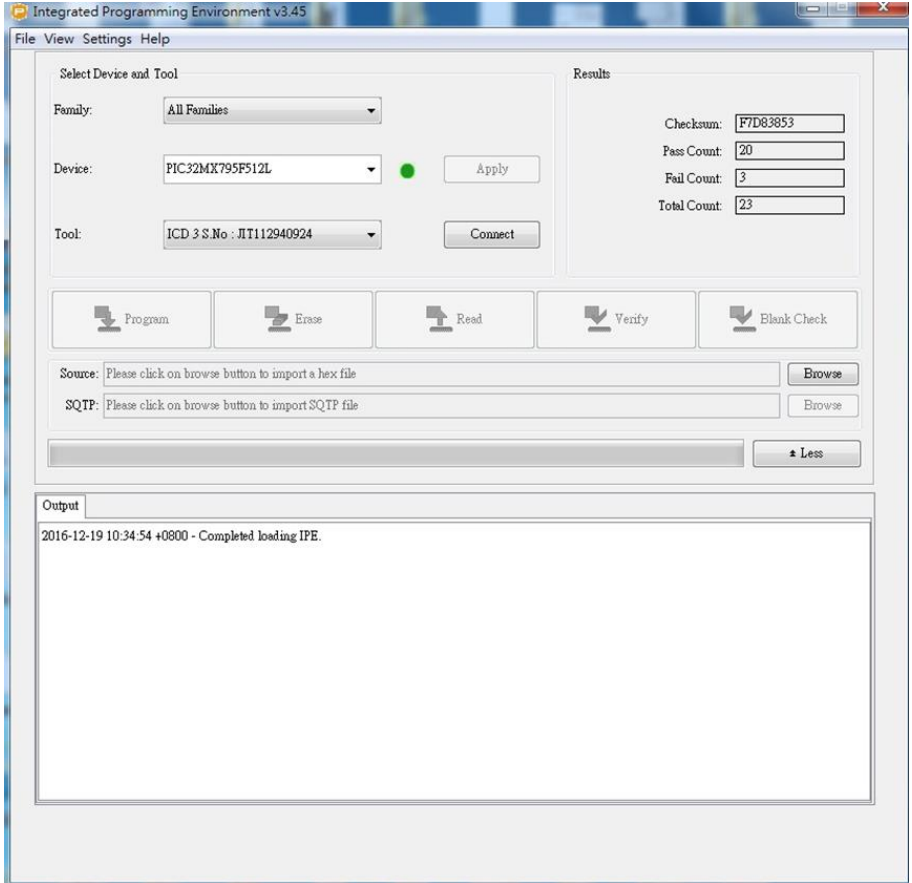
**MPLAB IPE v3.45**

**Step 4:** Select the following options.

Family: Please chose 32-bit MCUs (PIC32)

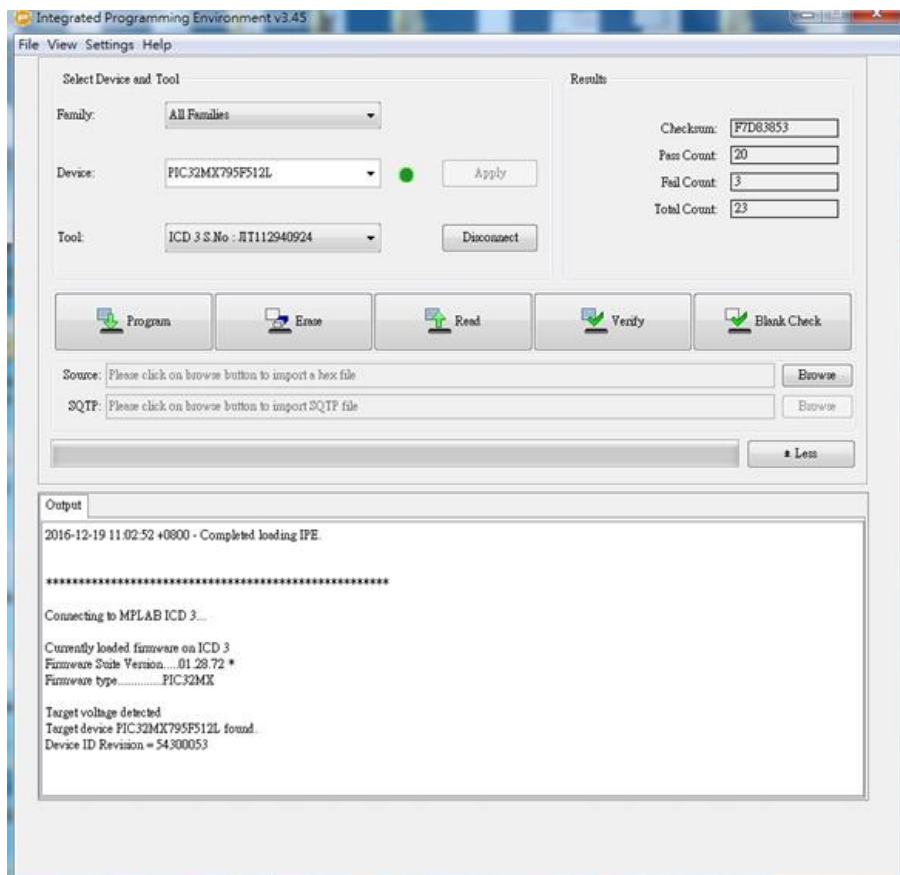
Device: Please select PIC32MX795F512L

Tool: Please select ICD 3 (with appropriate serial number)



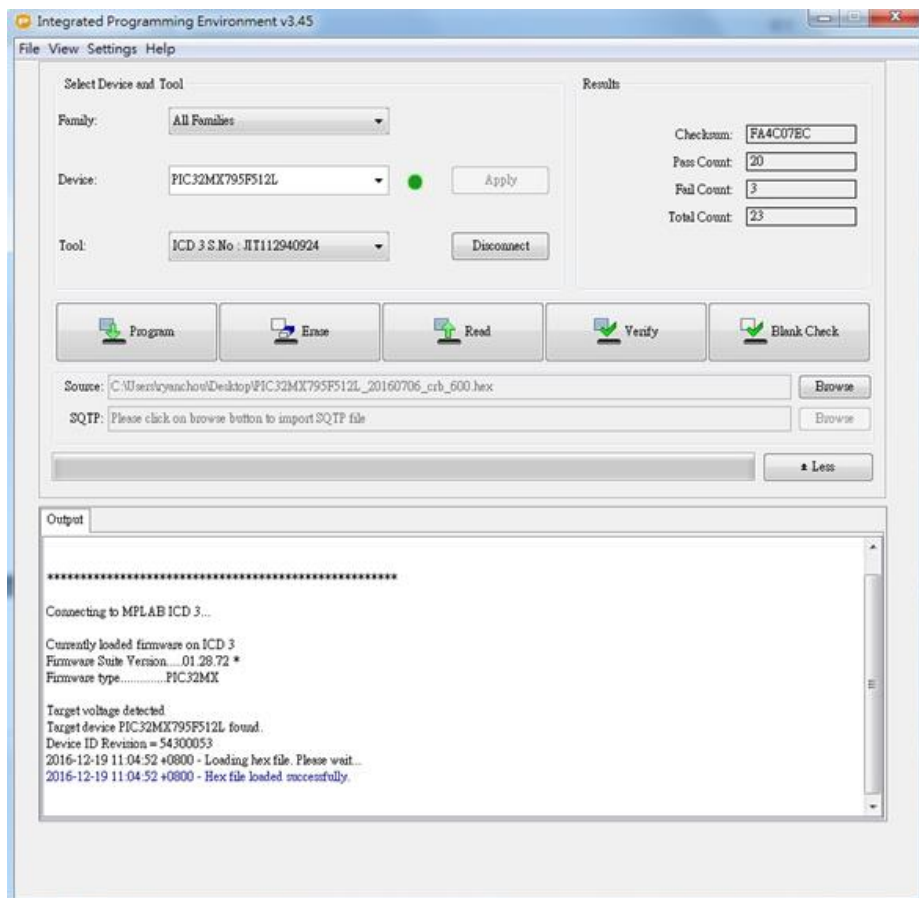
Microchip IPE initial screen

**Step 5:** After selecting the connect button to connect to the target board, the following screen will appear.



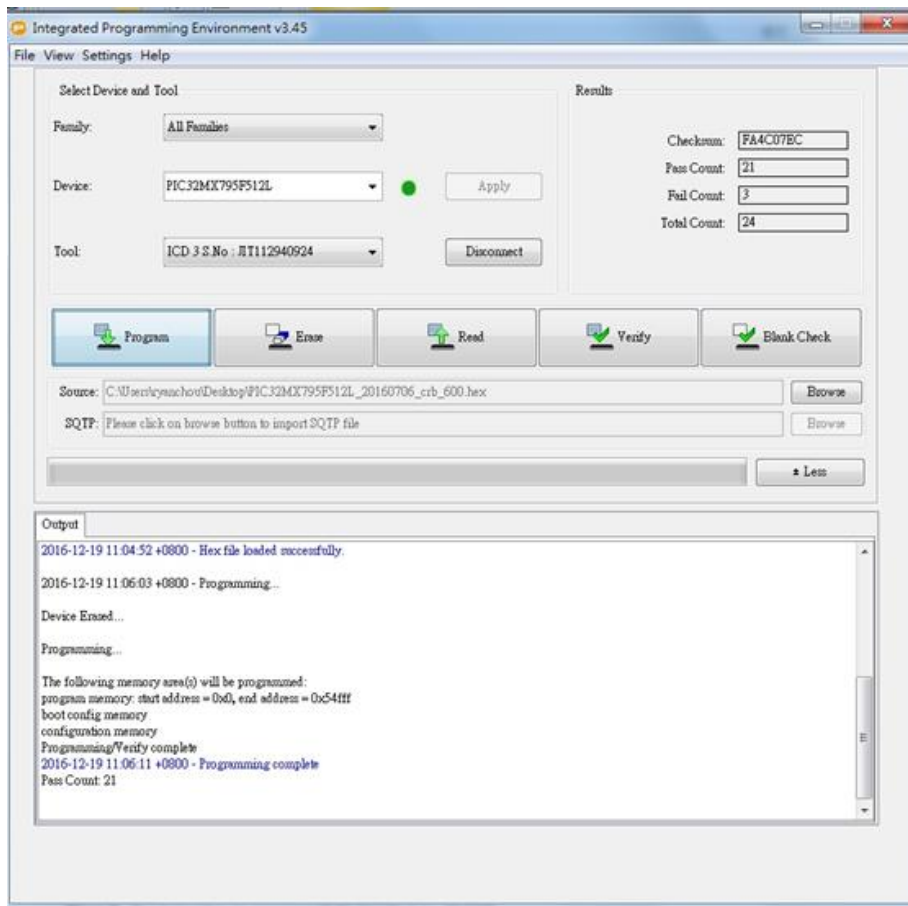
**Microchip IPE screen after connection**

**Step 6:** Please click on "Browse" and locate the firmware hex file from source side in order to load Hex file. You will then see an acknowledge message in MPLAB IPE as shown below.



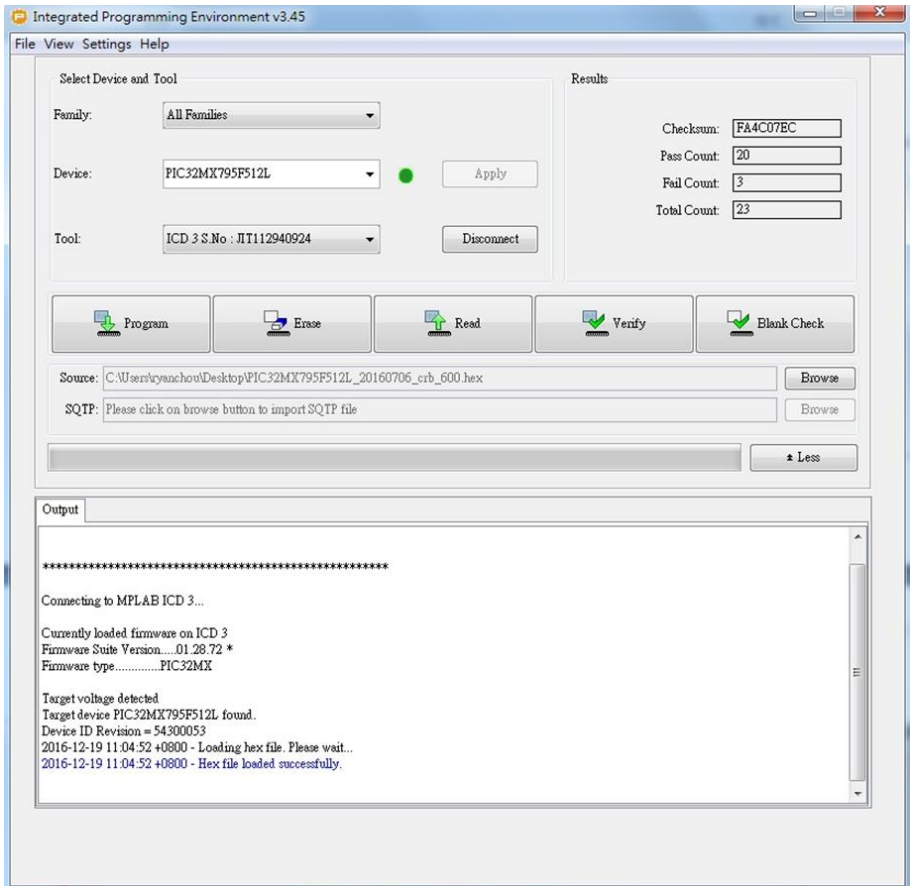
**Microchip IPE Hex file loaded screen**

**Step 7:** Please click on the Program button. After successfully programming, you will see the screen shown below.



**Microchip IPE Programming complete**

The HEX file has been successfully loaded to MCU PIC32.



Microchip IPE Hex file loaded screen

## 4.2 Vending SDK Installation

---

### 4.2.1 Windows 10 Version

---

Please follow the steps below to install supporting software programs before installing Intel\_Intelligent\_Vending\_Sample\_Application.exe.

**Step 1** Install QT 5.8 [https://download.qt.io/official\\_releases/qt/5.8/5.8.0/qt-opensource-windows-x86-msvc2015-5.8.0.exe](https://download.qt.io/official_releases/qt/5.8/5.8.0/qt-opensource-windows-x86-msvc2015-5.8.0.exe)

**Step 2** Update the PATH environment variable to include needed QT and Axis2C runtime binaries.

**Step 3** In order to update the environment variable PATH in Windows 10, please follow the steps below.

**Step 3.1** Right click the Windows start button in the lower left hand corner.

**Step 3.2** Click System from the menu.

**Step 3.3** Click Advanced System Settings from the left panel.

**Step 3.4** Click the Environment Variables button in the popup.

**Step 3.5** In the System Variables section scroll to PATH and click the button.

**Step 3.8** In the popup add the above paths and click the New button for each line:

c:\Qt\Qt5.8.0\5.8\msvc2015\bin

```
c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\sqldrivers
c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\mediaservice
c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\platforms
C:\Users\<TODO_ADD_WINDOWS_USER_NAME_HERE>\AppData\Local\Intel_Corporation\Intel(R) Intelligent Vending Sample Application\API\Bin\Windows\axis2c\lib
```

**Remark:** If there is no button to add each line and only a single textbox exists then add all paths separated by ;

For example:

```
<ANY_EXISTING_PATHS_HERE>;c:\Qt\Qt5.8.0\5.8\msvc2015\bin;c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\sqldrivers;c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\mediaservice;c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\platforms;C:\Users\<TODO_ADD_WINDOWS_USER_NAME_HERE>\AppData\Local\Intel_Corporation\Intel(R) Intelligent Vending Sample Application\API\Bin\Windows\axis2c\lib
```

**Step 4** Please Install Telemetry Dependencies

**Step 4.1** Install Mosquitto or another MQTT broker of your choice.

**Remark**

Mosquitto download is located here: <https://mosquitto.org/download/mosquitto-1.4.12-install-win32.exe>

Mosquitto will need OpenSSL and pthreadVC2 DLLs copied to its install directory. You will first need to install Mosquitto, and then copy the files to the Mosquitto Windows install directory (C:\Program Files (x86)\mosquitto\), install MSVC100 (see below). Then re-install Mosquitto.

**Step 4.2** Download pthreadvc2.dll



Use the prebuilt package at <ftp://sourceware.org/pub/pthreads-win32> and download the file pthreads-w32-2-9-1-release.zip.

**Step 4.3** After extracting the folder, copy Pre-built2/dll/x86/pthreadVC2.dll to your Mosquitto install directory.

**Step 5** For OpenSSL, you can copy libeay32.dll and ssleay32 dlls from the Vending SDK install directory

C:\Users\<TODO\_ADD\_WINDOWS\_USER\_NAME\_HERE>\AppData\Local\Intel\_Corporation\Intel(R) Intelligent Vending Sample Application\API\Bin\Windows

**Step 6** Please download MSVC100 the installer be downloaded from Microsoft using Microsoft Visual C++ 2010 Redistributable Package (x86) at

<https://www.microsoft.com/en-us/download/details.aspx?id=5555>

You will be able to successfully install and run the vending API program after installing support software.

## 4.2.2 Ubuntu 16.04 Xenial

---

Please make sure you have a working Internet connection and follow the steps below.

**Step 1** Copy the `Ubuntu_16.04_Xenial_Release` folder to your Ubuntu machine.

**Step 2** Open a terminal and execute: `sudo su`

**Step 3** In the terminal change directories to your copy of the `Ubuntu_16.04_Xenial_Release` folder

**Step 4** In the terminal execute: `chmod +x install.sh`

**Step 5** In the terminal execute: `./install.sh`

**Step 6** When prompted "Do you want to continue" enter Y to install all the software components.

**Step 7** When prompted enter the password for MariaDb: `root123`

**Step 8** After the install has completed successfully, in the terminal, execute: `mysql -u root -p`

**Step 9** When prompted enter `root123` as the password.

**Step 10** Execute: `source intel_vending.sql`

**Step 11** After the above sql file has been installed execute exit to exit. In the terminal execute: `cd /usr/local/bin`. Utilize any of the `Start*.sh` files to start the test apps, VendingDemo, Telemetry.

In the terminal execute: `cd /usr/local/bin`. Utilize any of the `Start*.sh` files to start the test apps, file name: VendingDemo

### 4.2.3 Update vending SDK for Ubuntu 16.04 Xenial

---

If you already have the SDK installed on Ubuntu 16.04 Xenial, please follow the steps below to upgrade an existing system.

**Step 1** Copy the `Ubuntu_16.04_Xenial_Release` folder to your Ubuntu machine.

**Step 2** Open a terminal and execute: `sudo su`

**Step 3** In the terminal change directories to your copy of the `Ubuntu_16.04_Xenial_Release` folder

**Step 4** In the terminal execute: `dpkg -r IntelVendingSDK`

**Step 5** In the terminal execute: `dpkg -i IntelVendingSDK-3.5.8.0-Linux.deb`

## 4.2.4 Update DB in vending SDK for Ubuntu 16.04 Xenial

---

If the upgrade requires a DB update, please follow the steps below.

**Step 1** In the terminal execute: `mysql -u root -p`

**Step 2** When prompted enter root123 as the password.

**Step 3** Execute: `source intel_vending.sql`

**Step 4** After the above sql file has been installed execute `exit` to exit.

**Note:** Re-installing the \*.deb or install.sh will NOT erase any changes previously made to the Vending database. Only Vending Demo files in the UI folder will be erased.