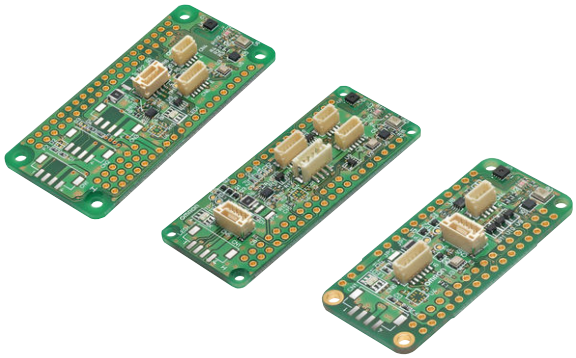
New Product

Sensor Evaluation Board
2JCIE-EV

Sensor evaluation board that supports open platform

- Easily implement development of a new IoT system that senses a wide variety of environmental information



RoHS compliant

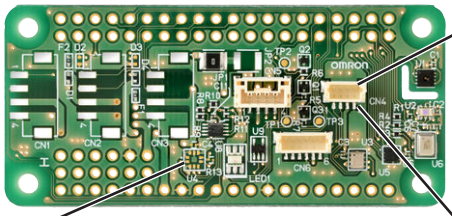
⚠ Refer to *Safety Precautions* on Page 9.

Features

Easily develop sensing IoT applications and PoC

- Evaluation board with six types of sensing functions.
- The product can be connected to a Raspberry Pi ✻1, Arduino ✻2, or Adafruit ✻3 baseboard, and enables easy sensor evaluation.
- The product can be connected to OMRON sensors (MEMS thermal sensor, MEMS flow sensor, Light convergent reflective sensor, air quality sensor, etc.) and Qwiic sensors.

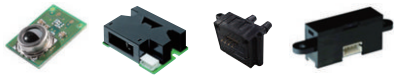
OMRON sensor evaluation board



Six types of sensing functions

Temperature, humidity, light, barometric pressure, noise, acceleration

Can be connected to OMRON sensors ✻4

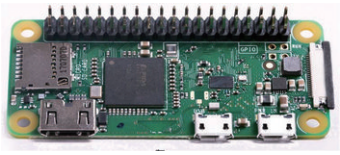


Includes a connector that supports Qwiic sensors.

Can be connected to a variety of sensors

+

Platform



(Raspberry Pi)

Supports three platforms

Raspberry Pi ✻1, Arduino ✻2, Adafruit ✻3

+

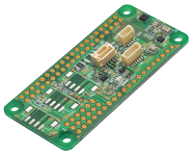
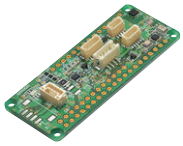
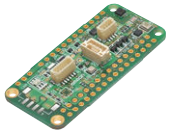
Sample source code for acquiring sensor data is available on GitHub

✻1. Raspberry Pi is a registered trademark of the Raspberry Pi Foundation.
✻2. Arduino is a registered trademark of Arduino LLC and Arduino SRL.
✻3. Adafruit is a registered trademark of Adafruit Industries LLC.
✻4. For details, see External Expansion Sensor on page 3.

2JCIE-EV

Ordering Information

Unit

Type	Appearance	Model	Supported platform ✻4	
			Table of Models	
RP type		**2JCIE-EV01-RP1**	Raspberry Pi ✻1	3 A/1 B+/2 B/3 B/3 B+/Zero/Zero W ✻5
AR type		**2JCIE-EV01-AR1**	Arduino ✻2	MKR Vidor 4000/MKR WiFi 1010/MKR ZERO ✻5
FT type		**2JCIE-EV01-FT1**	Adafruit ✻3	HUZZAH32 ✻5

Supported Accessories (Sold Separately)

Type	Model
Cable harness	**2JCIE-HARNESS-01**
	2JCIE-HARNESS-02
	2JCIE-HARNESS-03
	2JCIE-HARNESS-04
	2JCIE-HARNESS-05

✻1. Raspberry Pi is a registered trademark of the Raspberry Pi Foundation.
✻2. Arduino is a registered trademark of Arduino LLC and Arduino SRL.
✻3. Adafruit is a registered trademark of Adafruit Industries LLC.
✻4. Boards for supported platforms are not included.
✻5. Do not use a model other than those listed in each table of platform supporting models.

Note: The temperature sensor on the sensor evaluation board may output a high value due to heat generated by the platform. If you need to eliminate this effect, either separate the sensor from the unit by connecting a cable or otherwise, or use an external temperate/humidity sensor that supports SparkFun Qwiic.

Ratings and Specifications

Specifications

Item / Model	2JCIE-EV01-RP1	2JCIE-EV01-AR1	2JCIE-EV01-FT1
Protocol	Pi HAT	Shield for MKR form factor	FeatherWing
Dimensions (mm)	Approx. 65 x 30	Approx. 61.5 x 25	Approx. 50.8 x 23.9
Sparkfun Qwiic (3.3 V I2C)	CN4	CN4	CN4
5V I²C for expansion	CN5	CN5	CN5
	TH1	TH1	TH1
5V UART for expansion	CN6	CN6	CN6
5V DIO for expansion	---	CN7, CN8	TH2
Sensing data that can be acquired	Temperature, humidity, light, barometric pressure, noise, 3-axis acceleration		
Absolute maximum rating: Power voltage (5 V)	-0.2 to 5.5 V		
Absolute maximum rating: Power voltage (3.3 V)	-0.2 to 3.6 V		
Absolute maximum rating: Input/output terminal voltage (5 V)	-0.2 to 5.2 V		
Absolute maximum rating: Input/output terminal voltage (3.3 V)	-0.2 to 3.5 V		
Absolute maximum rating: Power current	700 mA		
Ambient storage temperature	-10 to 60°C (no condensation or icing)		
Ambient storage humidity	30 to 85% (no condensation or icing)		
Recommended operating range: Power voltage (5 V)	4.75 to 5.25 V		
Recommended operating range: Power voltage (3.3 V)	3.14 to 3.47 V		

Equipped Sensor

Part number ✻	Sensor	Model	Manufacturer	Interface
U1	Temperature/humidity sensor	SHT30-DIS-B	Sensirion	I²C
U2	Ambient light sensor	OPT3001DNP	Texas Instruments	I²C
U3	MEMS digital barometric pressure sensor	2SMPB-02E	OMRON	I²C
U5	MEMS digital motion sensor	LIS2DW12	STMicroelectronics	SPI
U6	MEMS microphone	SPH0645LM4H-B	Knowles	I²S

✻ For details, see the terminal layouts on pages 4 to 6.
Note: When using the sensor evaluation board, the accuracy indicated on the data sheet of each sensor manufacturer is not guaranteed.

External Expansion Sensor ✻1

Product	Manufacturer	Model	Supported connector ✻2			Supported accessories (sold separately)
			RP type	AR Type	FT type	
MEMS Thermal sensor	OMRON	D6T-44L-06/-H	CN5			2JCIE-HARNESS-01
		D6T-8L-09/-H				
		D6T-1A-01				
		D6T-1A-02				
		D6T-32L-01A				
MEMS flow sensor		D6F-PH0025AD1	CN4			2JCIE-HARNESS-02
		D6F-PH0505AD3				
		D6F-PH5050AD3				
		D6F-10A7D-000-0	CN4			2JCIE-HARNESS-03
		D6F-20A7D-000-0				
		D6F-50A7D-000-0				
		D6F-70AB7D-000-0				
Light convergent reflective sensor		B5W-LB2101-1	---	CN8	TH2	2JCIE-HARNESS-04
Air quality sensor		B5W-LD00101-1/-2		CN7	TH2	2JCIE-HARNESS-05

Note: When an external expansion sensor is connected to the sensor evaluation board, the current supply ability of the platform board may be exceeded. Consider suppling power using an external power supply. Check current supply ability in the data sheet and other literature of each platform board. When using an external power supply, check the Jumper Function information and use jumper switching.
✻1. We have checked the operation of typical models of each sensor.
✻2. For details, see the terminal layouts on pages 4 to 6.

Software

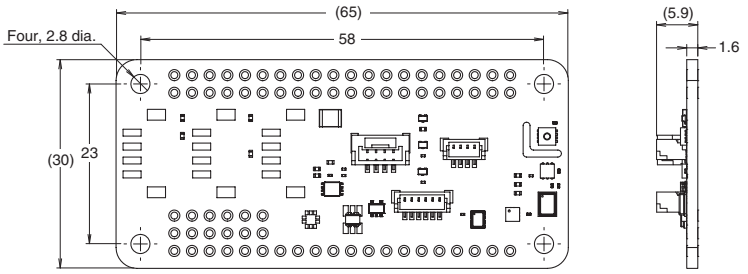
Access the sample source code that supports each platform from the following URL.
(https://www.components.omron.com/sensor/evaluation-board/2jcie)

Note: 1. The sample source code is for evaluation. OMRON does not guarantee its operation.
2. We bear no responsibility to correct mistakes or bugs in the sample source code for the purpose of changes or any other reason.
3. We cannot accept any inquiries regarding the sample source code.

Dimensions

(Unit: mm)

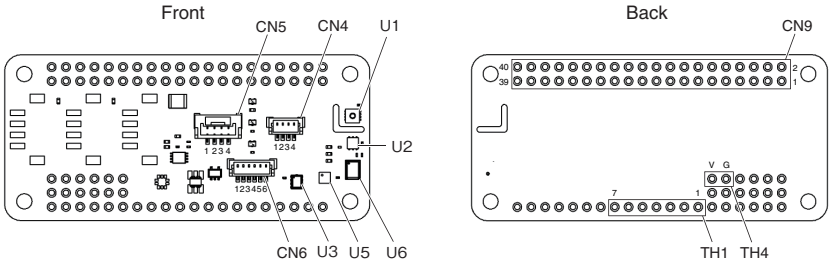
2JCIE-EV01-RP1



Connection

Terminal Arrangement

2JCIE-EV01-RP1



CN9			
1	3.3 VDC ✻1	2	5 VDC ✻2
3	SDA ✻1	4	NC
5	SCL ✻1	6	NC
7	NC	8	RXD ✻2
9	NC	10	TXD ✻2
11	DIGITAL4 ✻1	12	BCLK ✻1
13	RDY ✻2	14	NC
15	NC	16	DIGITAL1 ✻1
17	NC	18	DIGITAL2 ✻1
19	MOSI ✻1	20	GND
21	MISO ✻1	22	DIGITAL3 ✻1
23	SCLK ✻1	24	CS ✻1
25	NC	26	NC
27	NC	28	NC
29	EN ✻2	30	NC
31	LED_SW_R ✻2	32	LED_SW_G ✻2
33	LED_SW_B ✻2	34	NC
35	WS ✻1	36	INT ✻1
37	INT_LIS2DW12 ✻1	38	MIC_OUT ✻1
39	GND	40	NC

CN4 BM04B-SRSS-TB (JST)	
1	SCL
2	SDA
3	3.3 VDC
4	GND

CN5 BM04B-GHS-TB (JST)	
1	GND
2	5 VDC
3	SDA_5V
4	SCL_5V

CN6 BM06B-SRSS-TB (JST)	
1	5 VDC
2	RXD
3	TXD
4	GND
5	3.3 VDC
6	NC

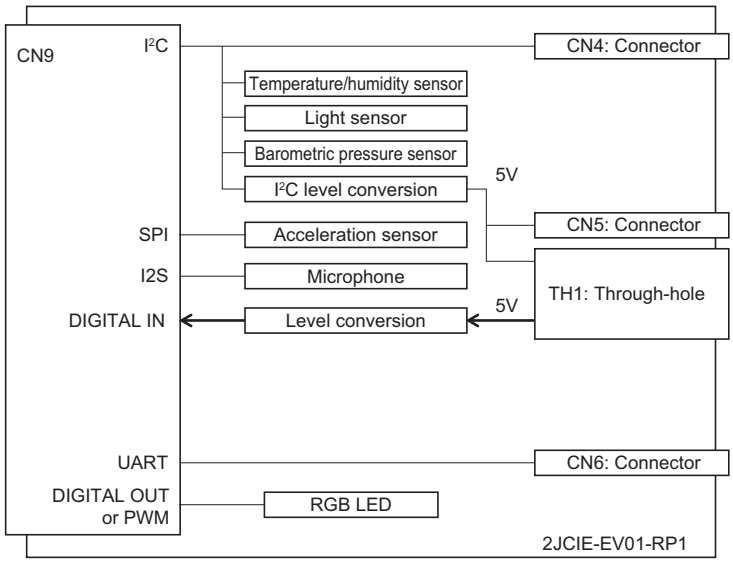
TH1	
1	5 VDC
2	GND
3	SCL_5V
4	SDA_5V
5	RDY
6	NC
7	GND

TH4	
19	5 VDC (Ext.)
07	GND

✻1. 3.3 V terminal **✻2.** 5.0 V terminal

Block Diagram

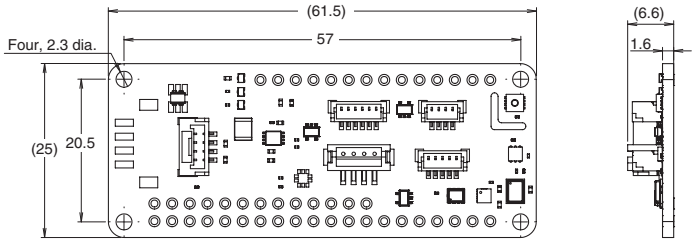
2JCIE-EV01-RP1



Dimensions

(Unit: mm)

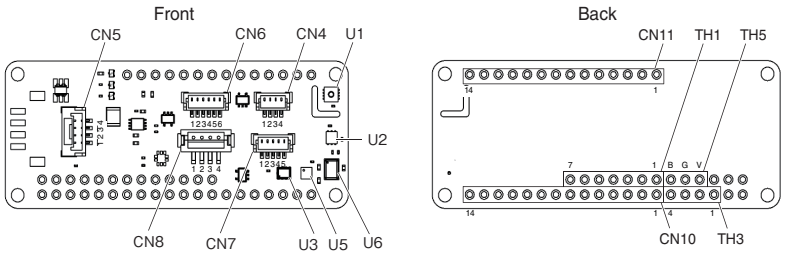
2JCIE-EV01-AR1



Connection

Terminal Arrangement

2JCIE-EV01-AR1



CN10	
1	NC
2	DAC ✻2
3	PMS_IN ✻2
4	B5WLA01_OUT ✻2
5	EN ✻2
6	B5WLA01_IN ✻2
7	PMS_OUT ✻2
8	MIC_OUT ✻1
9	CS ✻1
10	INT ✻1
11	BCLK ✻1
12	WS ✻1
13	LED_SW_R ✻2
14	LED_SW_G ✻2

CN11	
1	5 VDC ✻2
2	VBAT ✻1
3	3.3 VDC ✻1
4	GND
5	NC
6	RXD-B5W_OUT ✻2
7	TXD-B5W_OUT ✻2
8	SCL ✻1
9	SDA ✻1
10	MISO ✻1
11	SCLK ✻1
12	MOSI ✻1
13	NC
14	LED_SW_B ✻2

✻1. 3.3 V terminal ✻2. 5.0 V terminal

CN4 BM04B-SRSS-TB (JST)	
1	SCL
2	SDA
3	3.3 VDC
4	GND

CN6 BM06B-SRSS-TB (JST)	
1	5 VDC
2	RXD-B5W_OUT
3	TXD-B5W_OUT
4	GND
5	3.3 VDC
6	NC

CN5 BM04B-GHS-TB (JST)	
1	GND
2	5 VDC
3	SDA_5V
4	SCL_5V

CN7 BM05B-SRSS-TB (JST)	
1	5 VDC
2	TXD-B5W_OUT
3	GND
4	DAC
5	RXD-B5W_OUT

CN8 B4B-ZR-SM4-TF (JST)	
1	B5WLA01_IN
2	GND
3	B5WLA01_OUT
4	5 VDC

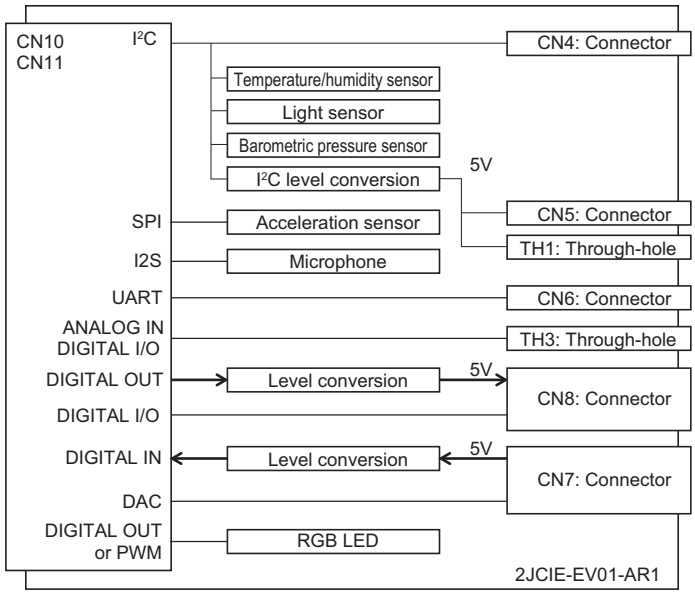
TH1	
1	5 VDC
2	GND
3	SCL_5V
4	SDA_5V
5	RXD-B5W_OUT
6	NC
7	GND

TH3	
1	5 VDC
2	PMS_IN
3	PMS_OUT
4	GND

TH5	
19	5 VDC (Ext.)
07	GND
B	VBAT

Block Diagram

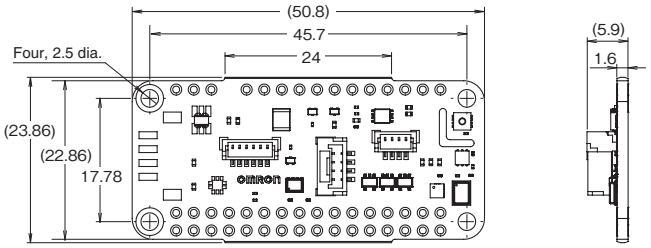
2JCIE-EV01-AR1



Dimensions

(Unit: mm)

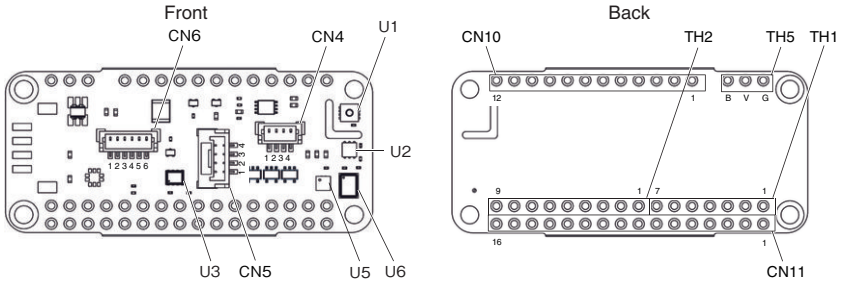
2JCIE-EV01-FT1



Connection

Terminal Arrangement

2JCIE-EV01-FT1



CN4 BM04B-SRSS-TB (JST)	
1	SCL
2	SDA
3	3.3 VDC
4	GND

CN5 BM04B-GHS-TB (JST)	
1	GND
2	5 VDC
3	SDA_5V
4	SCL_5V

CN11	
1	NC
2	3.3 VDC ✻1
3	NC
4	GND
5	DAC ✻2
6	LED_SW_B ✻2
7	INT ✻1
8	NC
9	PMS_IN ✻2
10	CS ✻1
11	SCLK ✻1
12	MOSI ✻1
13	MISO ✻1
14	TXD-B5W_OUT ✻2
15	RXD-B5W_OUT ✻2
16	EN ✻2

TH1	
1	5 VDC
2	GND
3	SCL_5V
4	SDA_5V
5	TXD-B5W_OUT
6	NC
7	GND

TH2	
1	5 VDC
2	DAC
3	RXD-B5W_OUT
4	TXD-B5W_OUT
5	B5WLA01_IN
6	PMS_B5WLA01_OUT
7	PMS_IN
8	PMS_B5WLA01_OUT
9	GND

CN6 BM06B-SRSS-TB (JST)	
1	5 VDC
2	RXD-B5W_OUT
3	TXD-B5W_OUT
4	GND
5	3.3 VDC
6	NC

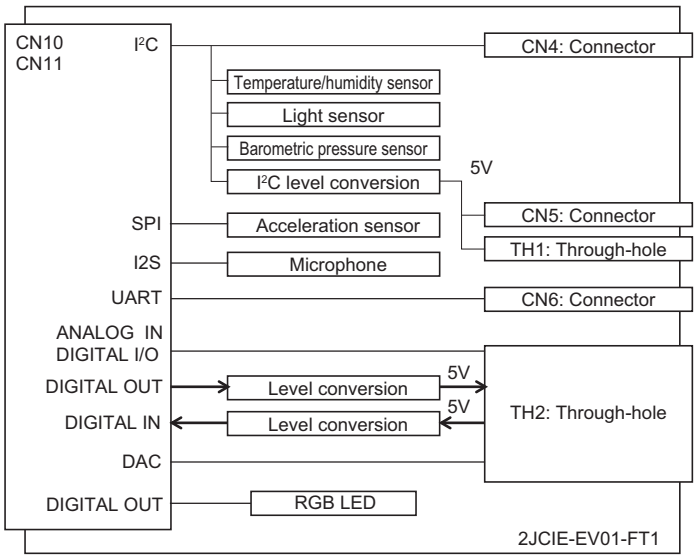
CN10	
1	VBAT ✻1
2	NC
3	5 VDC ✻2
4	B5WLA01_IN ✻2
5	LED_SW_R ✻2
6	LED_SW_G ✻2
7	PMS_B5WLA01_OUT ✻2
8	WS ✻1
9	MIC_OUT1 ✻1
10	BCLK ✻1
11	SCL ✻1
12	SDA ✻1

TH5	
19	GND
07	5 VDC (Ext.)
B	VBAT

✻1. 3.3 V terminal **✻2.** 5.0 V terminal

Block Diagram

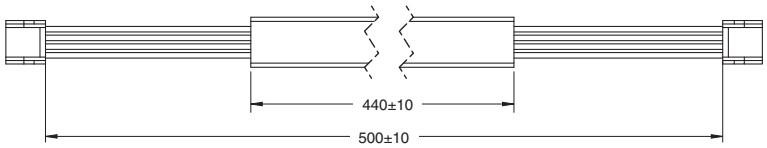
2JCIE-EV01-FT1



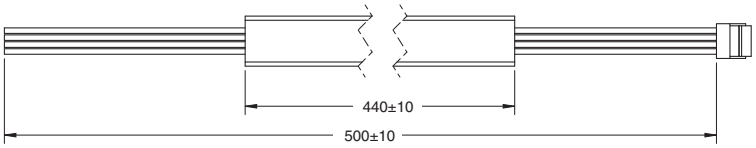
Dimensions

(Unit: mm)

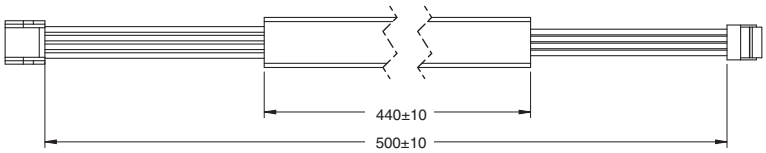
Cable harness (option)
2JCIE_HARNESS-01



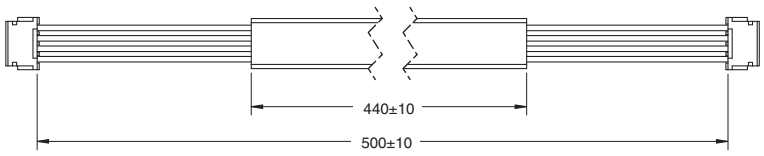
2JCIE_HARNESS-02



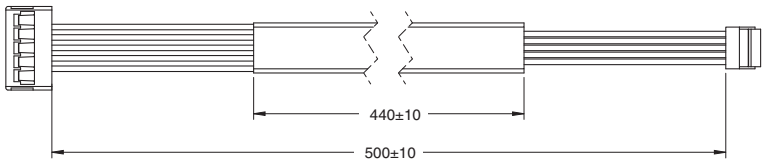
2JCIE_HARNESS-03



2JCIE_HARNESS-04



2JCIE_HARNESS-05



Jumper Function (Power Related)

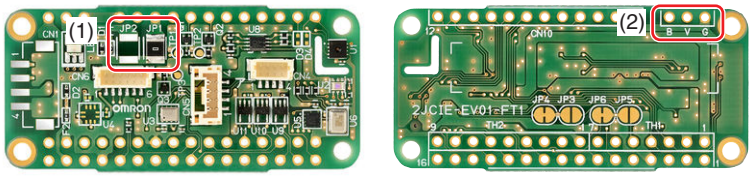
No.	Positions	Meaning	Application	Default	Status
JP1	Front	Zero-ohm resistance	When supplying power from the platform board	Connected	Enabled
JP2			When power is supplied from an external power supply or battery (Only the 2JCIE-EV01-AR1/FT1 supports batteries)	Open	Disabled

- When using an external power supply, remove the zero-ohm resistance from JP1 and connect the zero-ohm resistance to JP2 ((1) below). Connect the power of the external power supply to the V terminal in (2) below, and connect GND to G.
- (2JCIE-EV01-AR1/FT1 only) When using an external battery, connect the battery to B and GND to G. When using a battery, a 5 V input sensor cannot be used.
- When you switch to JP2, JP1 is disabled and power cannot be supplied from the platform board.
- Do not connect JP1 and JP2 at the same time.

How to switch by jumper

- Remove the zero-ohm resistance from JP1 by soldering arm and mount the JP2 by soldering. (Do not connect by soldering while connected to a base board or to an external power source)

2JCIE-EV01-FT1 Layout



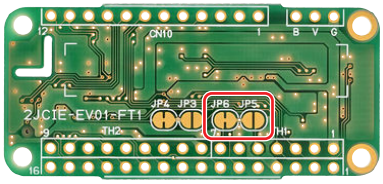
Jumper Function (Output Terminal)

No.	Positions	Meaning	Application	Default	Status
JP5	Back (2JCIE-EV01-AR1/FT1 only)	Switch by board pattern	For TH1 expansion	Open	Disabled
JP6			B5W digital output function	Connected	Enabled

When connected, the above function is enabled. When open, the above function is disabled.
JP5 and JP6 are paired and cannot both be enabled.

How to switch by jumper

Cut the JP6 connection location (central part) with cutters, and connect the divided parts of JP5 by soldering.



Note: Give full consideration to safety when cutting the jumper. OMRON cannot bear responsibility for any injury or damage that occurs.

Accessories

Type	Model
Pin socket for 2JCIE-EV01-RP1	ESQ-120-12-L-D (SAMTEC)
Pin header for 2JCIE-EV01-AR1	TSW-114-07-L-S (SAMTEC)
Pin socket for 2JCIE-EV01-FT1	ESQ-112-12-L-S (SAMTEC)
	ESQ-116-12-L-S (SAMTEC)

Note: To connect this board to the corresponding platform, it must be directly soldered or the pin header or socket must be soldered.

Safety Precautions

Precautions for safe use

Read the following to ensure safe use.
The safety precautions that are provided are extremely important to safety. Always read and heed the information provided in all safety precautions.

Explanation of safety symbols

⚠CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.
Precautions for Safe Use	Precautions on what to do and what not to do to ensure safe usage of the product.
Precautions for Correct Use	Precautions on what to do and what not to do to ensure proper operation and performance.

⚠CAUTION

- Do not incorporate this product in a product, regardless of the application.
- This product is not a measuring instrument. Do not use for purposes such as sensor output value measurement and diagnosis.
- When disposing of the product, follow local rules and regulations.

Precautions for Correct Use

- Keep out of the hands of small children when using and storing the product. If a small part is swallowed, immediately consult a physician.
- If you notice a strange odor or smoke coming from the product, or other abnormal condition, immediately shut off the power and consult your dealer.
- Do not handle this product with your bare hands. Risk of minor injury from the packaging box and edge of the board.
- Do not connect the indicated terminals or power not listed in this manual. Check the rating of each terminal, and do not use a current or voltage that exceeds the rating.
- This product is not waterproof. Do not use in an environment where water, oil, or chemicals may splash on the product. Do not wash with water or by ultrasound, and do not touch with wet hands.
- Do use an air blower. This may damage the sensor.
- Do not disassemble or modify the product.
- Do not grasp the product with excessive force, swing it around, or treat it roughly. Risk of product failure and injury.
- Do not use in an environment where corrosive, flammable, or explosive gases are present.

Precautions for Correct Use

- Treat the measured values acquired by this product as reference values.
- Do not connect this product to other than one of the models listed in each table of platform supporting models.
- The pin headers and sockets below are recommended for this product. For insertion/removal counts, refer to the latest data sheet / reliability test results for each pin header or socket.
  2JCIE-EV01-RP1: ESQ-120-12-L-D
  2JCIE-EV01-AR1: TSW-114-07-L-S
  2JCIE-EV01-FT1: ESQ-112-12-L-S
  ESQ-116-12-L-S
- When this product is connected to any of the platforms, heat and other effects from the platform will cause the output of the product to change. Check these effects sufficiently before using the product
- Check, understand, and consider the installation location of each sensor before using the product. Do not use with the area around each sensor in a sealed state.
- This is a precision product. Exercise caution when handling. Dropping the packing box or the unit, or subjecting the unit and its terminals to intense shock may result in product failure.
- Do not use or store the product in a high-temperature or high-humidity location, a location exposed to long hours of direct sunlight, or in a vehicle. Sudden changes of ambient temperature may cause internal condensation that results in malfunctioning.
- Do not use or store in a location with dust, salt, or iron powder. Dust or other contaminants may collect in or on the product and cause failure.
- Do not use in a location with intense static electricity or electromagnetic waves. Risk of product failure.

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