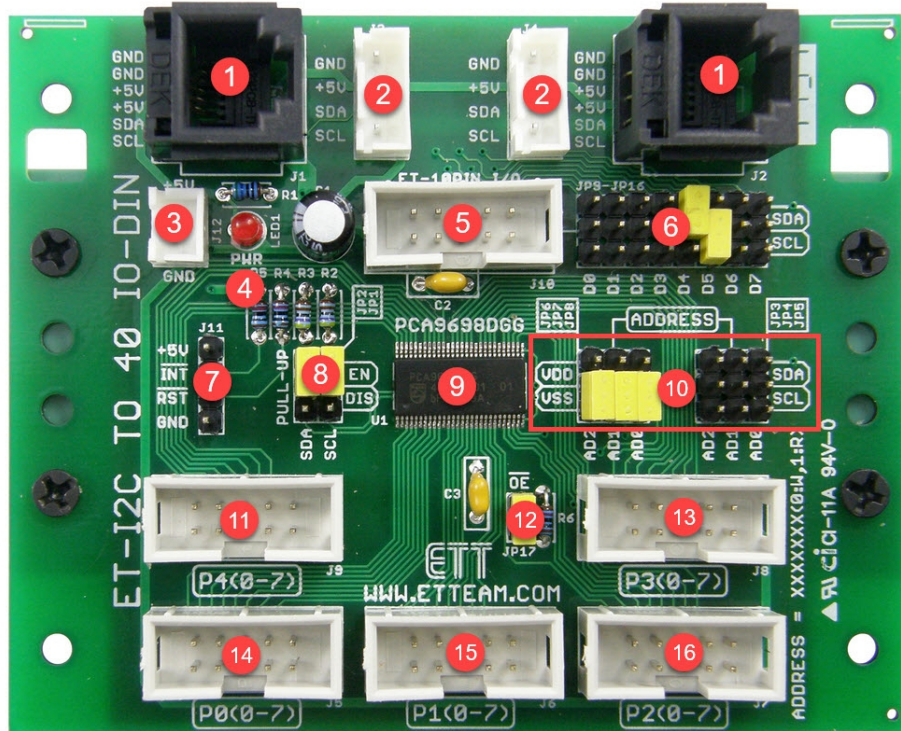


ET-I2C TO 40 IO-DIN is I/O EXPANSION BOARD for 40-BIT MCU that is divided into 8-BIT 5-PORT and it is I2C BUS Interface. Specifications of this board are listed as follows;

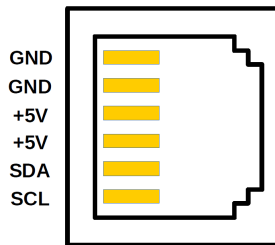
SPECIFICATIONS

- Use IC No.PCA9698DGG from NXP
- Use POWER SUPPLY 2.3V-5.5V
- Pin I/O can be set to be either 40-BIT INPUT and OUTPUT (8-BIT 5-PORT)
- Use I2C BUS Interface with the maximum Frequency at 1 MHz (Fast-Mode)
- Only use 3 Pin ADDRESS to setup and choose 64-Address of Board
- Can be fastened with Rail DIN 35mm
- PCB Size: 96.5 mm x 76.2 mm

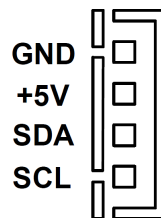
BOARD'S COMPONENTS



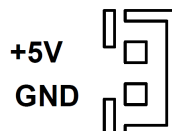
- No.1: It is Connector I2C RJ11 and Pins are arranged as shown below.



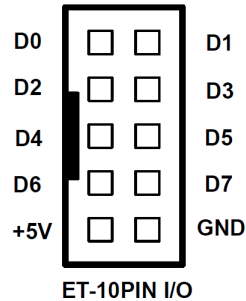
- No.2: It is Connector I2C WAFER and Pins are arranged as shown below.



- No.3: It is addition Connector POWER SUPPLY and Pins are arranged as shown below.



- **No.4:** It is LED to display state of POWER SUPPLY of board.
- **No.5:** It is Connector ET-10PIN I/O to connect with ETT Board that uses Connector 10PIN and Pins are arranged as shown below.



- **No.6:** It is JUMPER to choose Pin Signal from Connector ET-10PIN I/O to be either Pin SCL or Pin SDA. Referred to the picture, Pin D4 is set to be Pin SDA and Pin D5 is set to be Pin SCL.
- **No.7:** It is PIN INTERRUPT and PIN RESET of IC No.PCA9698DGG.
- **No.8:** It is JUMPER to choose PULL-UP Resistor of Pin SCL and Pin SDA. If it is used, it is set to the position of EN; but, if it is unused, it is set to the position of DIS.
- **No.9:** It is IC No.PCA9698DGG.
- **No.10:** It is JUMPER to choose ADDRESS of Board. For more information, please look at the table below. The example below chooses the value as ADDRESS **40h** (AD2=VSS , AD1=VSS , AD0=VSS).

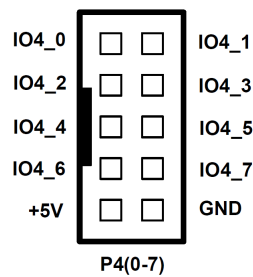
PCA9698 address map

AD2	AD1	AD0	A6	A5	A4	A3	A2	A1	A0	Address
V _{SS}	SCL	V _{SS}	0	0	1	0	0	0	0	20h
V _{SS}	SCL	V _{DD}	0	0	1	0	0	0	1	22h
V _{SS}	SDA	V _{SS}	0	0	1	0	0	1	0	24h
V _{SS}	SDA	V _{DD}	0	0	1	0	0	1	1	26h
V _{DD}	SCL	V _{SS}	0	0	1	0	1	0	0	28h
V _{DD}	SCL	V _{DD}	0	0	1	0	1	0	1	2Ah
V _{DD}	SDA	V _{SS}	0	0	1	0	1	1	0	2Ch
V _{DD}	SDA	V _{DD}	0	0	1	0	1	1	1	2Eh
V _{SS}	SCL	SCL	0	0	1	1	0	0	0	30h
V _{SS}	SCL	SDA	0	0	1	1	0	0	1	32h
V _{SS}	SDA	SCL	0	0	1	1	0	1	0	34h
V _{SS}	SDA	SDA	0	0	1	1	0	1	1	36h
V _{DD}	SCL	SCL	0	0	1	1	1	0	0	38h
V _{DD}	SCL	SDA	0	0	1	1	1	0	1	3Ah
V _{DD}	SDA	SCL	0	0	1	1	1	1	0	3Ch
V _{DD}	SDA	SDA	0	0	1	1	1	1	1	3Eh
V _{SS}	V _{SS}	V _{SS}	0	1	0	0	0	0	0	40h
V _{SS}	V _{SS}	V _{DD}	0	1	0	0	0	0	1	42h
V _{SS}	V _{DD}	V _{SS}	0	1	0	0	0	1	0	44h
V _{SS}	V _{DD}	V _{DD}	0	1	0	0	0	1	1	46h
V _{DD}	V _{SS}	V _{SS}	0	1	0	0	1	0	0	48h
V _{DD}	V _{SS}	V _{DD}	0	1	0	0	1	0	1	4Ah
V _{DD}	V _{DD}	V _{SS}	0	1	0	0	1	1	0	4Ch
V _{DD}	V _{DD}	V _{DD}	0	1	0	0	1	1	1	4Eh
V _{SS}	V _{SS}	SCL	0	1	0	1	0	0	0	50h
V _{SS}	V _{SS}	SDA	0	1	0	1	0	0	1	52h
V _{SS}	V _{DD}	SCL	0	1	0	1	0	1	0	54h
V _{SS}	V _{DD}	SDA	0	1	0	1	0	1	1	56h
V _{DD}	V _{SS}	SCL	0	1	0	1	1	0	0	58h
V _{DD}	V _{SS}	SDA	0	1	0	1	1	0	1	5Ah
V _{DD}	V _{DD}	SCL	0	1	0	1	1	1	0	5Ch
V _{DD}	V _{DD}	SDA	0	1	0	1	1	1	1	5Eh

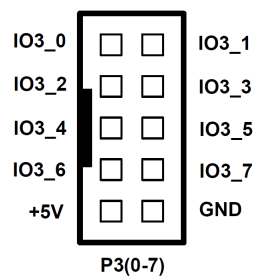
PCA9698 address map ...continued

AD2	AD1	AD0	A6	A5	A4	A3	A2	A1	A0	Address
SCL	SCL	V _{SS}	1	0	1	0	0	0	0	A0h
SCL	SCL	V _{DD}	1	0	1	0	0	0	1	A2h
SCL	SDA	V _{SS}	1	0	1	0	0	1	0	A4h
SCL	SDA	V _{DD}	1	0	1	0	0	1	1	A6h
SDA	SCL	V _{SS}	1	0	1	0	1	0	0	A8h
SDA	SCL	V _{DD}	1	0	1	0	1	0	1	AAh
SDA	SDA	V _{SS}	1	0	1	0	1	1	0	ACH
SDA	SDA	V _{DD}	1	0	1	0	1	1	1	A Eh
SCL	SCL	SCL	1	0	1	1	0	0	0	B0h
SCL	SCL	SDA	1	0	1	1	0	0	1	B2h
SCL	SDA	SCL	1	0	1	1	0	1	0	B4h
SCL	SDA	SDA	1	0	1	1	0	1	1	B6h
SDA	SCL	SCL	1	0	1	1	1	0	0	B8h
SDA	SCL	SDA	1	0	1	1	1	0	1	BAh
SDA	SDA	SCL	1	0	1	1	1	1	0	BCh
SDA	SDA	SDA	1	0	1	1	1	1	1	BEh
SCL	V _{SS}	V _{SS}	1	1	0	0	0	0	0	C0h
SCL	V _{SS}	V _{DD}	1	1	0	0	0	0	1	C2h
SCL	V _{DD}	V _{SS}	1	1	0	0	0	1	0	C4h
SCL	V _{DD}	V _{DD}	1	1	0	0	0	1	1	C6h
SDA	V _{SS}	V _{SS}	1	1	0	0	1	0	0	C8h
SDA	V _{SS}	V _{DD}	1	1	0	0	1	0	1	CAh
SDA	V _{DD}	V _{SS}	1	1	0	0	1	1	0	CCh
SDA	V _{DD}	V _{DD}	1	1	0	0	1	1	1	CEh
SCL	V _{SS}	SCL	1	1	1	0	0	0	1	E0h
SCL	V _{SS}	SDA	1	1	1	0	0	1	0	E2h
SCL	V _{DD}	SCL	1	1	1	0	0	1	1	E4h
SCL	V _{DD}	SDA	1	1	1	0	1	0	0	E6h
SDA	V _{SS}	SCL	1	1	1	0	1	0	1	E8h
SDA	V _{SS}	SDA	1	1	1	0	1	1	0	E Ah
SDA	V _{DD}	SCL	1	1	1	0	1	1	1	ECh
SDA	V _{DD}	SDA	1	1	1	0	0	0	1	E Eh

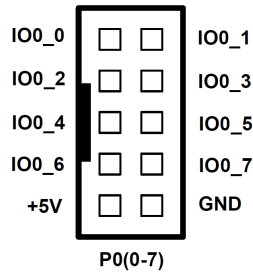
- No.11: It is Connector IDC10 for Pin IO4_0 – IO4_7 and Pins are arranged as shown below;



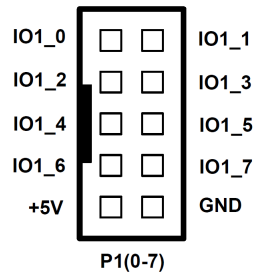
- No.12: It is JUMPER to enable/disable the operation of PCA9698DGG; normally, it is enabled.
- No.13: It is Connector IDC10 for Pin IO3_0 – IO3_7 and Pins are arranged as shown below;



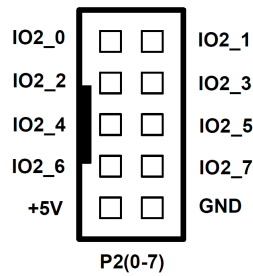
- No.14: It is Connector IDC10 for Pin IO0_0 – IO0_7 and Pins are arranged as shown below;



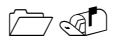
- No.15: It is Connector IDC10 for Pin IO1_0 – IO1_7 and Pins are arranged as shown below;



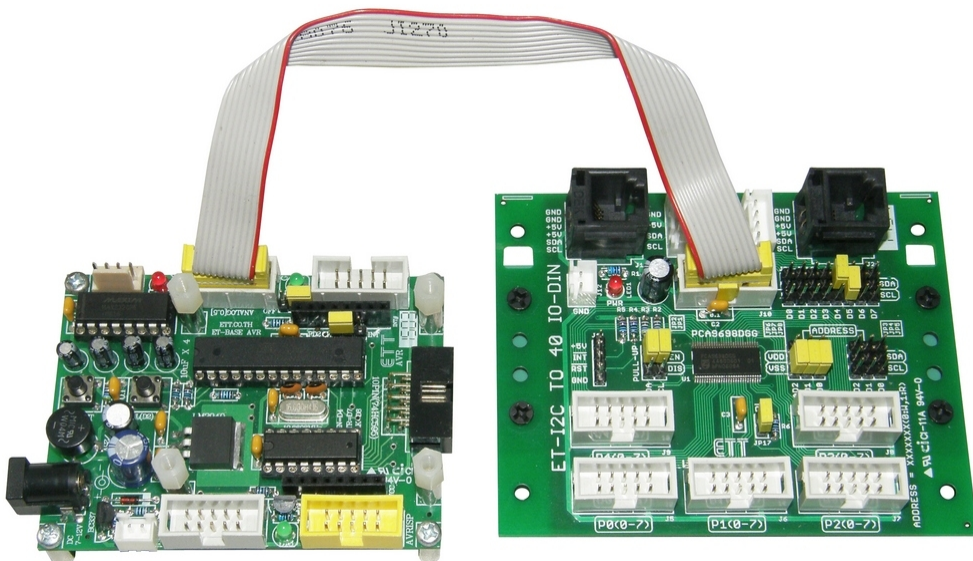
- No.16: It is Connector IDC10 for Pin IO2_0 – IO2_7 and Pins are arranged as shown below;




EXAMPLE OF CONNECTING BOARD ET-I2C TO 40 IO-DIN WITH BOARD ARDUINO



This example illustrates how to connect with Boards ET-BASE AVR EASY328 as shown below;



It sets the value of Board ET-I2C TO 40 IO-DIN to be ADDRESS 40h (AD2=VSS , AD1=VSS , AD0=VSS) and connect signal between boards through Connector ET-10PIN I/O and Connector ANALOG [0..5] of Board ET-BASE AVR EASY328. In this case, Pin A4 is Pin SDA and Pin A5 is Pin SCL, so it has to set JUMPER on Board ET-I2C TO 40 IO-DIN; it has to set JUMPER D4 to be SDA and set JUMPER D5 to be SCL.

 Open the Example Program PCA9698_OUT in the Folder name **Examples** provided in CD-ROM. This Example Program illustrates how to send out the value to Port P0-P4 to upload program into Board. Next, it connects LED to test operation at Port P0-P4 (user can edit ADDRESS of Board as preferred, please look at the program below; in this case, this example sets the value as Address 0x40).

```
PCA9698_OUT | Arduino 1.8.4
File Edit Sketch Tools Help

PCA9698_OUT
1 /*
2  * Examples : Arduino Examples By...ETT CO.,LTD
3  * Program  : PCA9698_OUT
4  * Software : Arduino 1.8.4
5  * Hardware : ET-BASE AVR EASY328 + ET-I2C TO 40 IO-DIN
6  * Function  : Test output PCA9698
7  */
8
9 #include "Wire.h"
10 #define ADDR 0x40 >> 1 // Address for PCA9698 (AD2=VSS,AD1=VSS,AD0=VSS)
11
12 int out[8]={0x01,0x02,0x04,0x08,0x10,0x20,0x40,0x80};
13
14 void setup()
15 {
16   Wire.begin(); // Initial I2C Bus
17
18 // Set up ports 0-4
19   Wire.beginTransmission(ADDR);
20   Wire.write(0x98); // Auto-Increment flag is set (AI = 1) and I/O Configuration
21   Wire.write(0x00); // PORT 0 for output
22   Wire.write(0x00); // PORT 1 for output
23   Wire.write(0x00); // PORT 2 for output
24   Wire.write(0x00); // PORT 3 for output
25   Wire.write(0x00); // PORT 4 for output
26   Wire.endTransmission();
27 }
```