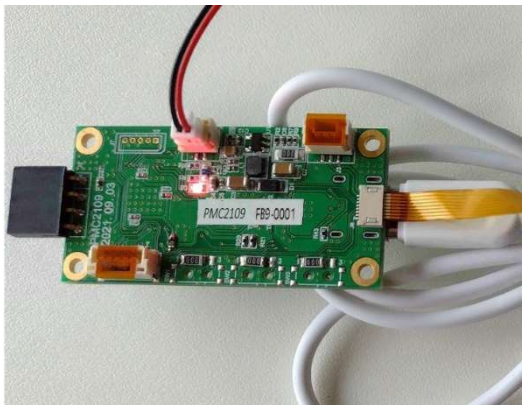
PMC2109 Controller

for Piezo Linear Stages

PZS-X50-03F and co.

V1.01 2025/02



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1. Introduction

This user manual provides information about the electrical specifications of the PMC-2109. PMC-2109 Controller is offered in single axis configurations. The PMC-2109 performs digital position and velocity control for one axis, using incremental encoder devices as the main position feedback.

2. Features

- Industry's smallest piezo motor controller solution.
- PID Control and IIR filter Algorithm.
- USB (Serial over USB) Interface.
- Data Recording.
- Single Axis configuration.

3. Safety precautions

Connect or disconnect the stage cable from or to PMC2109, only when the main power cord is disconnected from the wall outlet.

4. Specifications

Model	**PMC-2109**
Power	
Operating Voltage	5 V (±10%)
Electrical power	1.5 W
Power consumption	0.3 A
Communication	USB (Serial over USB)
Baud rate	115200 bps
Transmission code	ASC II
Data length	8 bit
Stop bit length	1 bit
Parity check	Nil
User software	Piezo Terminal
Environmental	
Ambient operating temperature	0 - +50°C
Storage temperature	-20°C - +70°C
Operating humidity	0 – 80%
Dimensions	25mm x 50mm x 8mm
Weight	8g

Table 1: technical data

5. Block Diagram

This section describes the block diagram of PMC-2109

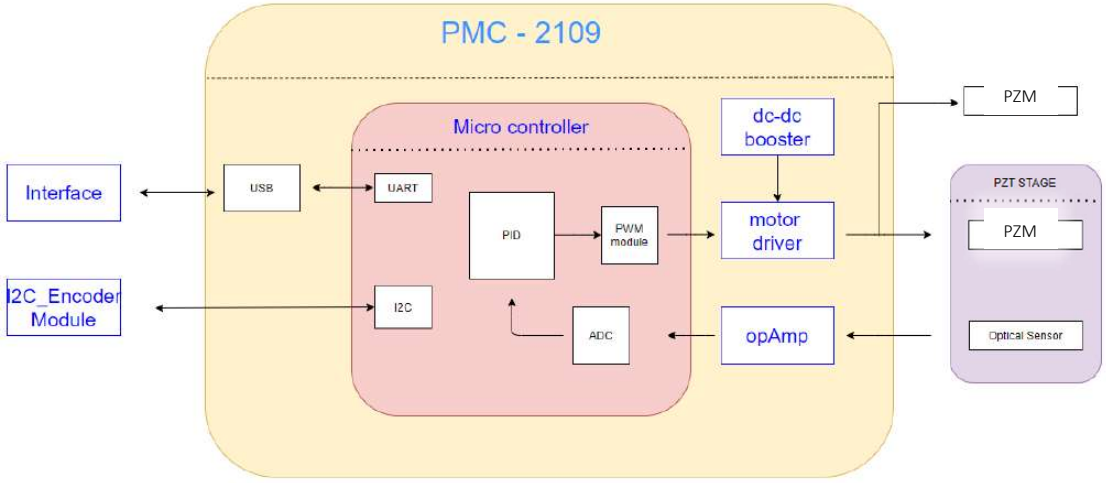

Figure 1: PMC2109 Block Diagram

6. Layout

This section describes the layout of PMC-2109.

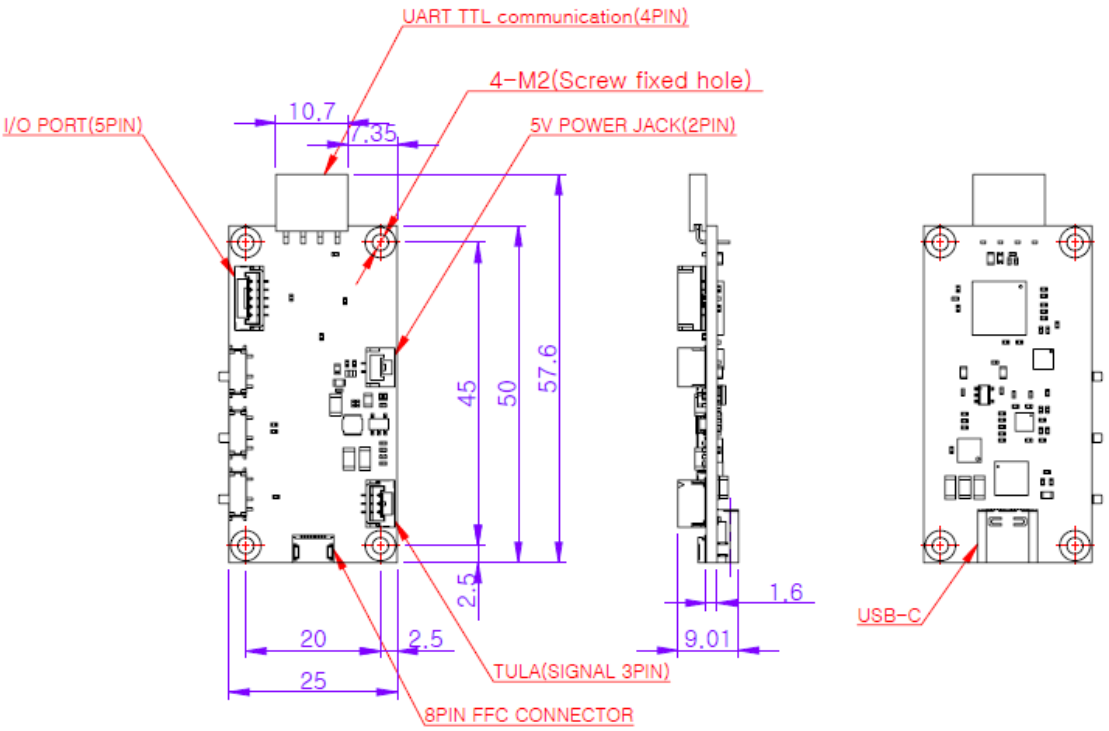

Figure 2: PMC-2109 Dimension

7. Switch setup

This section describes the switch of PMC-2109.

7.1 optopass mode (stage)

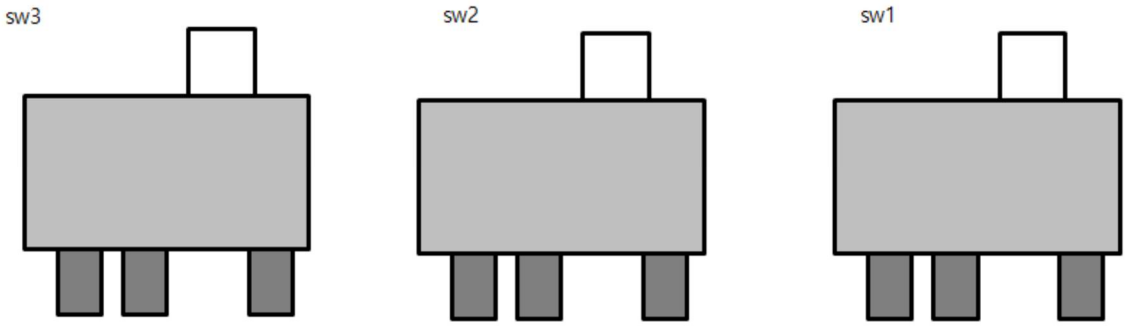

Figure 3: Stage mode

7.2 I²C encoder mode

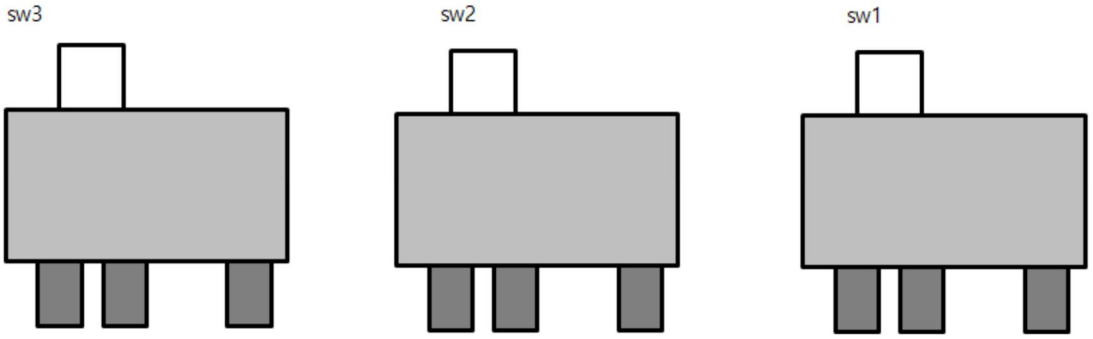

Figure 4: I²C mode

8. CONNECTOR PIN CONFIGURATION

This section describes the motor and encoder connector pin out.

8.1 Power

Connector J1: JST, BM02B-GHS-TB

Pin#	Pin-Name	Pin-Type	Description
1	VCC5MAIN	P	Positive supply for PMC-2109
2	GND	-	Ground reference for PMC-2109

Table 2: PMC2109 main power connector pin out

8.2 Motor

Connector J3: JST, SM03B-GHS-TB

Pin#	Pin-Name	Pin-Type	Description
1	MOT A	O	High voltage output A
2	MOT B	O	High voltage output B
3	GND	-	Ground reference for PMC-2109

Table 3: PMC2109 motor connector pin out

8.3 Stage (PZS-Xxx-xx series)

Connector J8: Molex, 51281-0894 (FPC connector)

Pin#	Pin-Name	Pin-Type	Description
1	OPT_C	I	Signal C of NJL9101R
2	3.3Vdc	-	Common of NJL9101R
3	OPT_B	I	Signal B of NJL9101R
4	OPT_A	I	Signal A of NJL9101R
5	ANODE	O	Anode of NJL9101R
6	CATHODE	I	Cathode of NJL9101R
7	MOT_A	O	Signal of Piezo Motor A
8	MOT_B	O	Signal of Piezo Motor B

Table 4: PMC2109 encoder connector pin out

8.4 USB C type (Serial over USB)

Connector J8: Molex, 105450-0101

Pin#	Pin-Name	Pin-Type	Description
A4,B4 A9,B9	VCC5USB	I	Positive supply for FT232R
A7,B7	D-	I/O	Differential line D-
A6,B6	D+	I/O	Differential line D+
A2,B2 A3,B3 A5,B5, A8,B8	N.C.	-	Not connected
A1,B1 A12,B12	GND	-	Ground reference for PMC-2001

Table 5: PMC2109 USB connector pin out

8.5 I^2C_connector (for I^2C interface encoder module)

Connector J4: JST, SM05B-GHS-TB

Pin#	Pin-Name	Pin-Type	Description
1	VCC 5V	-	Positive supply for I^2C module
2	VCC 3.3V	-	Positive supply for I^2C module
3	I^2C_SCL	O	Clock of I^2C interface
4	I^2C_SDA	I/O	Data of I^2C interface
5	GND	-	Ground reference for PMC-2109

Table 6: PMC2109 digital I/O connector pin out