



High Accuracy
Electronic Level Module
PEL-200m

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1. INTRODUCTION

PEL stands for Precaster Electronic Level. PEL-200m is the core module for partners for making their devices. The PEL-200 is the finished product on top of PEL-200m and is targeting at the mid-high end of users who need accuracy for machine installation, monitor the status of the level.

■ TARGET AND SCOPE

This document defines the specification of the level and the mechanical figure of PEL-200m, the module simply provide X-axis and Y-axis readings in a single string, the output rate is around 0.5Hz with $\pm 0.005^\circ$ typical accuracy.

■ FEATURE

- Digital output with TX-RX signal or Pin Holes.
- Low power consumption

■ APPLICATION

- Positioning and monitor objects.
- Security application movement detections.
- Level and elevator measurement.

2. SPECIFICATION

Product Name	PEL-200m	
Measure Range	$\pm 9.999^\circ$	
Measure Direction	X-axis & Y-axis	
Repeatability Accuracy*	$\pm 0.005^\circ$	$\pm 0.09\text{mm/m}$
Absolute Accuracy within $\pm 3^\circ$ *	$\pm 0.01^\circ$	$\pm 0.17\text{mm/m}$
Absolute Accuracy within $\pm 10^\circ$ *	$\pm 0.04^\circ$	$\pm 0.70\text{mm/m}$
Temperature Drifting	$1.5''/^\circ\text{C}$	$0.007\text{mm/m}/^\circ\text{C}$
X & Y Cross Accuracy	1%	
Minimum Motion Detecting Angle	$\pm 0.002^\circ$	$\pm 0.035\text{mm/m}$
Working temperature	$-10^\circ\text{C} \sim +50^\circ\text{C}$	
Storage temperature	$-20^\circ\text{C} \sim +60^\circ\text{C}$	
Response Time	2 secs / 0.5Hz	
Dimensions	75 × 50 × 32mm	
Weight	Approx. 100 g	
Power Source	DC 5V	
Power Consumption	50 mA	
Remark	*Favorable Temperature: 25°C	

3. DATA FORMAT

The PEL-200m send an 8 bits string with the 24 chars, Δ is space character (0x20)

Example 1,

X-Axis Sensor Output = -9.876

Y-Axis Sensor Output = 9.876

1	2	3	4	5	6	7	8	9	10	11	12
X	:	Δ	Δ	-	9	.	8	7	6	Δ	C/R

13	14	15	16	17	18	19	20	21	22	23	24
Y	:	Δ	Δ	Δ	9	.	8	7	6	Δ	C/R

In case the X or Y sensor failure, the string length will remain the same with space instead.

Example 1-2,

X-Axis Sensor Output = -9.876

Y-Axis Sensor Output = **FAIL**

1	2	3	4	5	6	7	8	9	10	11	12
X	:	Δ	Δ	-	9	.	8	7	6	Δ	C/R

13	14	15	16	17	18	19	20	21	22	23	24
Y	:	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	C/R

Example 1-3,

X-Axis Sensor Output = **FAIL**

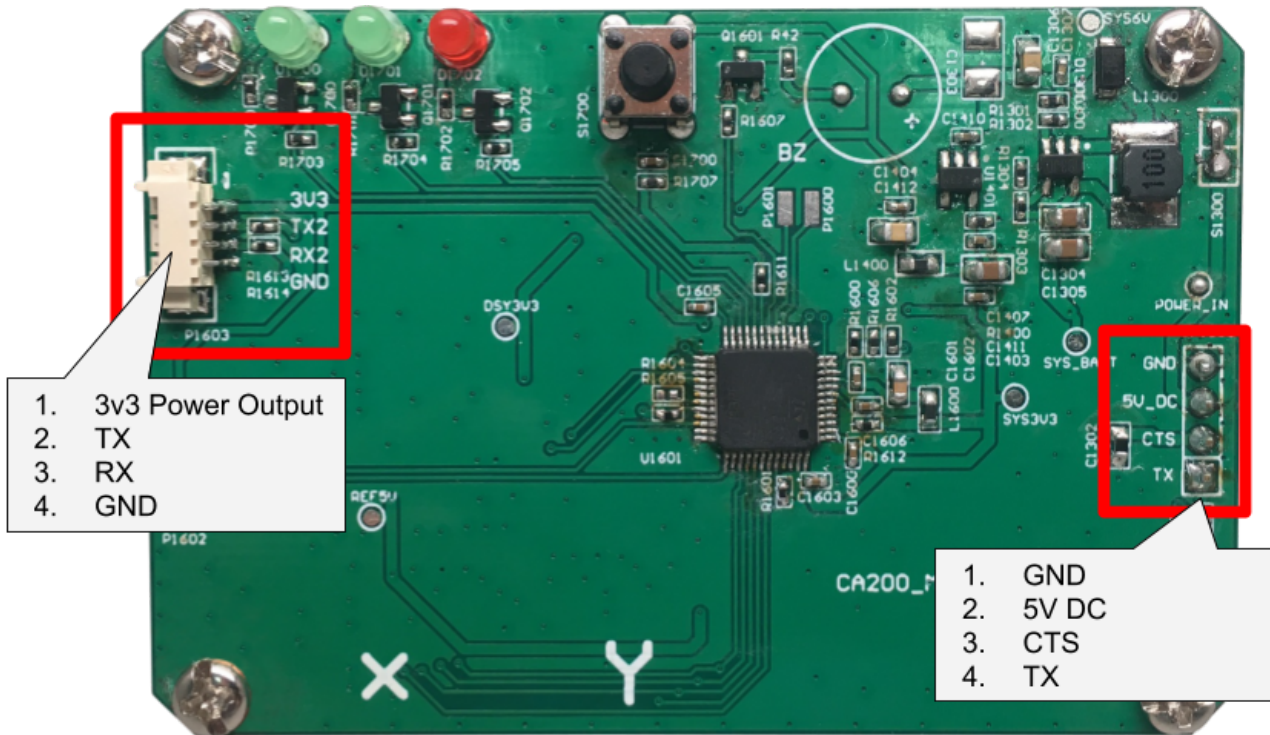
Y-Axis Sensor Output = 9.876

1	2	3	4	5	6	7	8	9	10	11	12
X	:	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	C/R

13	14	15	16	17	18	19	20	21	22	23	24
Y	:	Δ	Δ	Δ	9	.	8	7	6	Δ	C/R

4. INTERFACE

There are two connectors on PEL-200m, one is the connector at the left, the other is 4 pinholes at the right, see the images below,



1. 3v3 Power Output
2. TX
3. RX
4. GND

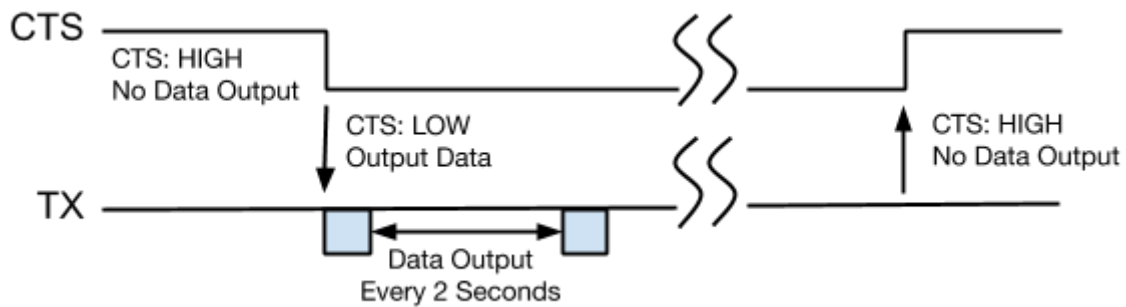
1. GND
2. 5V DC
3. CTS
4. TX

- CONNECTOR (LEFT)

- 3.3V Power Output is generated by internal LDO. The power shall be supplied from the 5V DC at the PINHOLE at RIGHT
- Baud Rate: 9600bps
- Command Table

Command	Action	Return
0xAA 0x02 0x06 0xB2	Read Data	Refer to 3. DATA FORMAT
0xAA 0x02 0xC0 0X6C	Enter Calibration	Zero Mode OK
0xAA 0x02 0xC1 0X6D	Calibration Step 1	Zero Step 1 OK
0xAA 0x02 0xC2 0X6E	Calibration Step 2	Zero Step 2 OK Then Exit Calibration Mode
0xAA 0x02 0xD1 0X7D	LED Switch	LED ON / LED OFF

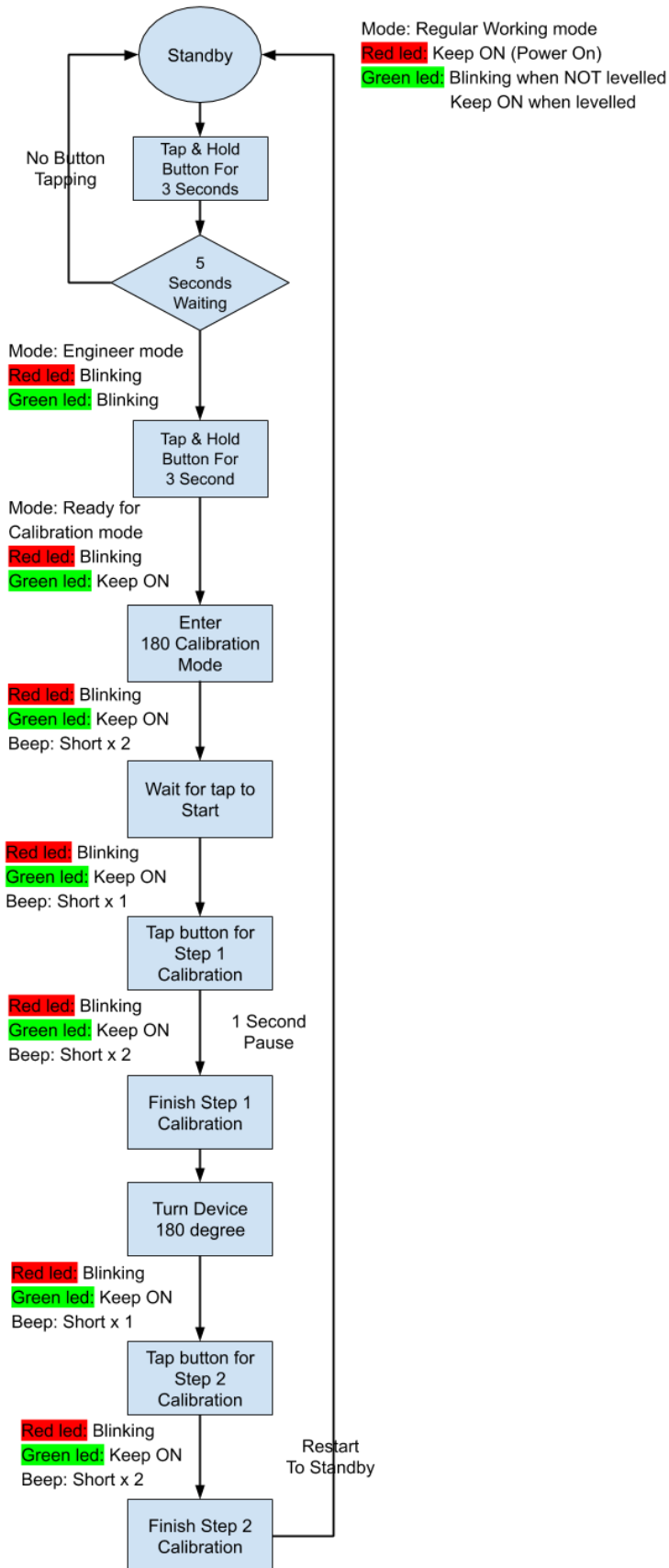
- PINHOLES (RIGHT)
 - Power: 5V DC (the PINHOLE at the RIGHT)
 - Baud Rate: 1200bps
 - Parity Bit: None
 - Stop Bit: 1bit
 - Data Bit: 8bit
 - Char Counts: 24Chars



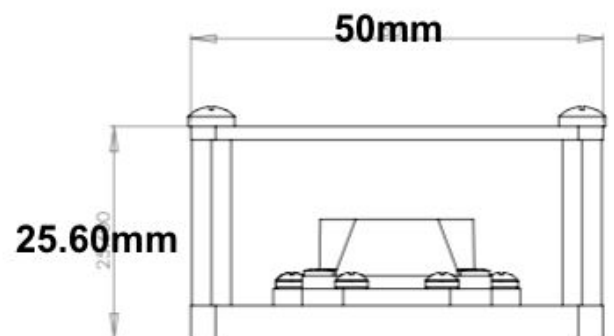
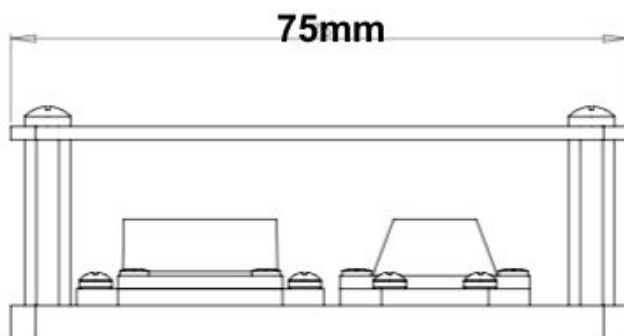
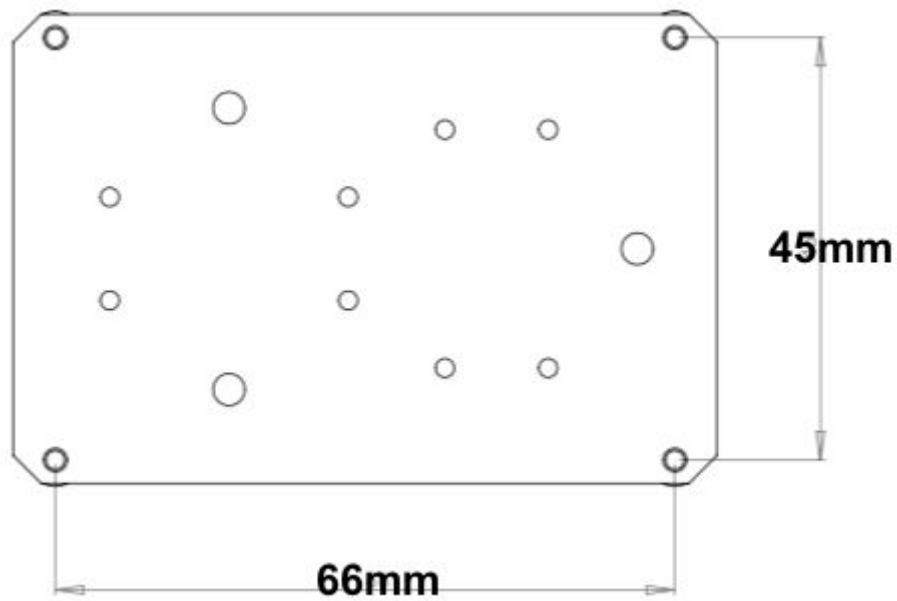
When the CTS signal is high level, the TX pin pulls high, there will be no output data.

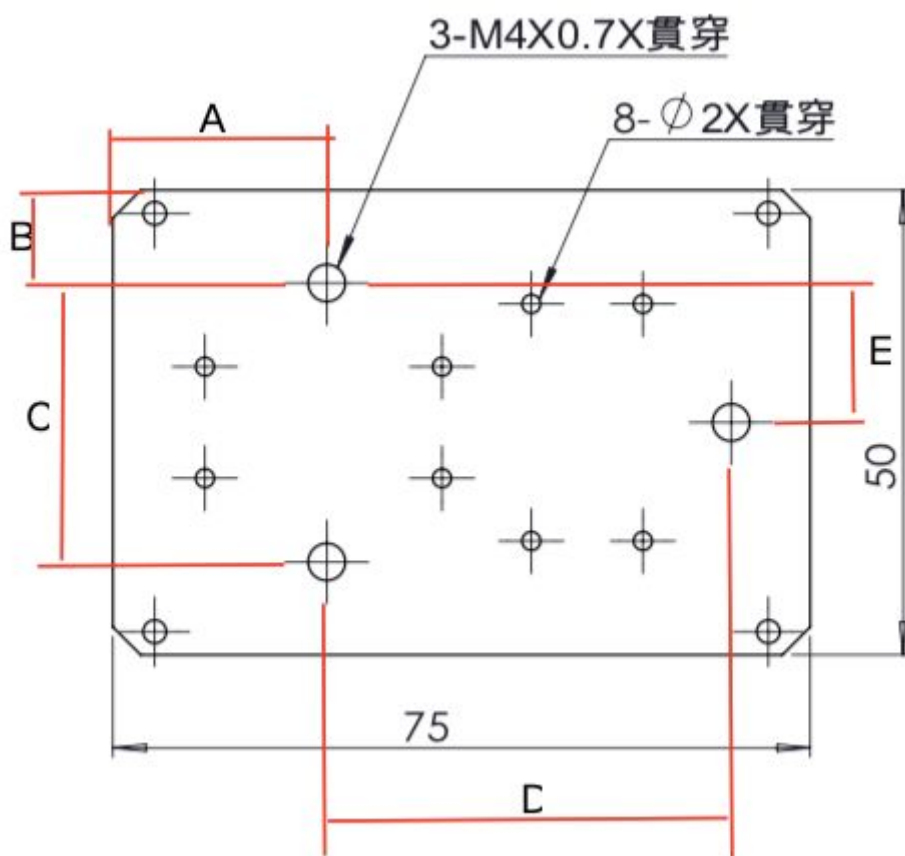
When the CTS signal is low level, the TX pin output data continuously, the interval time is 2 seconds.

5. CALIBRATION FLOW CHART



6. DIMENSION





Length:

A: 28.0mm

B: 10.0mm

C: 30.0mm

D: 43.5mm

E: 15.0mm



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