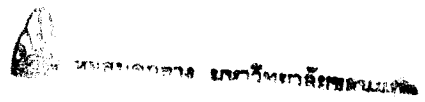


ภาคผนวก ก.

TK
7867
2466



ภาคผนวก ก.

โปรแกรมควบคุมการทำงานของ ADC และแสดงน้ำหนัก

```
#include <stdio.h>
#include <conio.h>
#include <graphics.h>
#include <dos.h>
#include <math.h>
#define PORT_A      0x300
#define PORT_B      0x301
#define PORT_C      0x302
#define CTRL_PORT   0x303
#define CTRL_WORD   0x89
#define MORE        255
#define LESS        254
#define W_Dispatch midx-50,midy-25,midx+50,midy+25,1
#define R_Dispatch maxx-190,maxy-40,maxx-160,maxy,2
main()
{
    float weight;
    float sum = 0;
    int gd = DETECT, gm, maxx, maxy, midx, midy;
    int I, A, B, num = 1, done = 0, r_disp = 0;
    char *x="\0", c;
    initgraph(&gd,&gm,"");
    maxx = getmaxx();
    midx = maxx/2;
    maxy = getmaxy();
    midy = maxy/2;
    outtextxy(maxx-210, 20, "Function Key");
    outtextxy(maxx-240, 30, "Esc' - Exit weighting");
    outtextxy(maxx-240, 40, "r' - Reset weighting");
    outtextxy(maxx-240, 50, "p' - Pause weighting");
    outtextxy(maxx-240, 60, "d' - Rounds display on/off");

    settextstyle(1, 0, 5);
    outtextxy(midx-70, 90, "Weight");
    setlinestyle(0, 0, 9);
    rectangle(midx-55, midy-27, midx+55, midy+27);
    outtextxy(midx+80, midy-15, "Kg");
    setviewport(W_Dispatch);

    while(!done)
    {
        if(kbhit())
        {
            c = getch();
            if(c == 27) done = 1; /* Exit weighting */
            if(c == 'r') {num = 1; sum = 0;} /* Reset weighting */
            if(c == 'p') /* Pause Weighting */
            {
                settextstyle(1, 0, 1);
                setviewport(midx-150, midy+31, midx+150, midy+91, 3);
                outtextxy(5, 15, "Pause! Press 'Enter' to resume");
                getch();
                clearviewport();
                setviewport(W_Dispatch);
            }
        }
        if(c == 'd')
        {
            if(r_disp == 0)
            {
                settextstyle(1, 0, 1);
                setviewport(0, 0, maxx,maxy, 8);
                outtextxy(maxx-150, maxy-40, "Rounds Weight");
            }
            else
            {

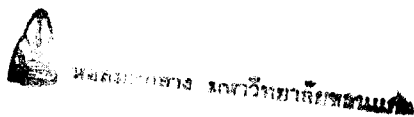
```

```

        setviewport(maxx-180, maxy-40, maxx, maxy, 6);
        clearviewport();
    }
    r_disp = !r_disp;
}
outportb(CTRL_PORT, CTRL_WORD);          /* Send control word to control port */
delay(2);
A = 0;                                    /* Initial value of A */
for(i = 0x80; i > 0; i /= 2)              /* Loop binary search for port A */
{
    outportb(PORT_A, A+i);                /* Send port A with data to compare */
    outportb(PORT_B, 0);                  /* with incoming weight by port B is set to 0 */
    delay(2);
    if(inportb(PORT_C) == LESS)
    {
        A += i;
    }
}
for(B = 0; B <= 255; B++)                /* Loop sequential search for port B */
{
    outportb(PORT_A, A);
    outportb(PORT_B, B);
    delay(2);
    if(inportb(PORT_C) == MORE)
    {
        B--;
        break;
    }
}
weight = (1.95*(A+(B/256.)));             /* Weight calculating */
sum = sum+weight;                         /* Summary Weight all of round weighting */
num++;
if (!(num%10))                             /* Average Weight display every 10 rounds */
{
    settxtstyle(1, 0, 5);
    sprintf(x, "%3d\0", (int)(sum/(num-1)), weight); /* Print out Average weight */
    setviewport(W_Dispatch);
    clearviewport();
    outtextxy(20, 0, x);
    if (r_disp == 1)
    {
        settxtstyle(1, 0, 1);
        setviewport(R_Dispatch);
        clearviewport();
        sprintf(x, "%3d\0", num);             /* Display Round */
        outtextxy(0, 0, x);
    }
}
if (num == 201)
{
    num = 1;
    sum = 0;
}
}
closegraph();
}

```

ภาคผนวก ข.



ภาคผนวก ข.

รายละเอียดและคุณสมบัติเฉพาะของ Load cell

Specifications:

Norminal Ouput at Capacity	2 mV/V \pm 0.1%
Norminal Capacity	500 Kg.
Linearity Error	0.017%
Output Resistance	351 Ohm
Input Resistance	410 Ohm
Repeatability	0.01%
Compensated Temp. Range	-10 to 50° C.
Safe Load	100% Capacity
Recommended Exitation	5V to 12V ac/dc
Maximum Exitation	15 Vdc.

Cabling

Red	+ Exitaion
Black	- Exitation
Green	+ Signal
White	- Signal