**1 [ELEVATOR](file:///\\\\ELEVATOR) PRO.**

#include <lpc214x.h>

#define LED\_OFF (IO0SET = 1U << 31)

#define LED\_ON (IO0CLR = 1U << 31)

void delay\_ms(unsigned int j);

void elevator\_run(void);

int main() {

IO0DIR |= (1U << 31) | (0xFF << 16);

IO1DIR |= (1U << 24);

LED\_ON;

elevator\_run();

while (1);

}

void delay\_ms(unsigned int j) {

unsigned int x, i;

for (i = 0; i < j; i++) {

for (x = 0; x < 10000; x++); // Approximate delay

}

}

void elevator\_run(void) {

int i, val;

unsigned int counter;

IO1CLR = 1U << 24;

IO0CLR = 0x000F0000;

do {

IO0CLR = 0x00F00000;

IO0SET = 0x00F00000;

do {

counter = (IO1PIN >> 16) & 0x0000000F;

} while (counter == 0x0F);

if (counter == 0x0E) {

val = 3;

} else if (counter == 0x0D) {

val = 6;

} else if (counter == 0x0B) {

val = 8;

} else if (counter == 0x07) {

val = 10;

}

for (i = 0; i < val; i++) {

IO0CLR = 0x000F0000;

IO0SET = i << 16;

delay\_ms(100);

}

for (i = 0; i < val; i++) {

IO0CLR = 0x000F0000;

IO0SET = i << 16;

delay\_ms(100);

}

} while (1);

}

**3 STEEPER MOTOR**

#include <lpc214x.h>

#define LED\_OFF (IO0SET = 1U << 31)

#define LED\_ON (IO0CLR = 1U << 31)

#define PLOCK 0x00000400

void delay\_ms(unsigned int j);

void SystemInit(void);

int main()

{

unsigned int no\_of\_steps\_clk = 100, no\_of\_steps\_aclk = 100;

IO0DIR |= 1U << 31 | 0x00FF0000 | 1U << 30;

LED\_ON; delay\_ms(500);LED\_OFF;

do{

IO0CLR = 0X000F0000;IO0SET = 0X00010000;delay\_ms(10);if(--no\_of\_steps\_clk == 0) break;

IO0CLR = 0X000F0000;IO0SET = 0X00020000;delay\_ms(10);if(--no\_of\_steps\_clk == 0) break;

IO0CLR = 0X000F0000;IO0SET = 0X00040000;delay\_ms(10);if(--no\_of\_steps\_clk == 0) break;

IO0CLR = 0X000F0000;IO0SET = 0X00080000;delay\_ms(10);if(--no\_of\_steps\_clk == 0) break;

}while(1);

do{

IO0CLR = 0X000F0000;IO0SET = 0X00080000;delay\_ms(10);if(--no\_of\_steps\_aclk == 0) break;

IO0CLR = 0X000F0000;IO0SET = 0X00040000;delay\_ms(10);if(--no\_of\_steps\_aclk == 0) break;

IO0CLR = 0X000F0000;IO0SET = 0X00020000;delay\_ms(10);if(--no\_of\_steps\_aclk == 0) break;

IO0CLR = 0X000F0000;IO0SET = 0X00010000;delay\_ms(10);if(--no\_of\_steps\_aclk == 0) break;

}while(1);

IO0CLR = 0X00FF0000;

while(1);

}

void delay\_ms(unsigned int j)

{

unsigned int x,i;

for(i=0;i<j;i++)

{

for(x=0; x<10000; x++);

}

**2 SEVEN SEGMENT DISPLAY**

#include <lpc214x.h>

#define LED\_OFF (IO0SET = 1U << 31)

#define LED\_ON (IO0CLR = 1U << 31)

#define PLOCK 0x00000400

void delay\_ms(unsigned int j);

unsigned char getAlphaCode(unsigned char alphachar);

void alphadisp7SEG(char \*buf);

int main()

{

IO0DIR |= 1U << 31 | 1U << 19 | 1U << 20 | 1U << 30 ;

LED\_ON;

while(1)

{

alphadisp7SEG("fire");

delay\_ms(500);

alphadisp7SEG("help");

delay\_ms(500);

}

}

unsigned char getAlphaCode(unsigned char alphachar)

{

switch (alphachar)

{

case 'f':return 0x8e;

case 'i':return 0xf9;

case 'r':return 0xce;

case 'e':return 0x86;

case 'h':return 0x89;

case 'l':return 0xc7;

case 'p':return 0x8c;

case ' ': return 0xff;

default : break;

}

return 0xff;

}

void alphadisp7SEG(char \*buf)

{

unsigned char i,j;

unsigned char seg7\_data,temp=0;

for(i=0;i<5;i++)

{

seg7\_data = getAlphaCode(\*(buf+i));

for (j=0 ; j<8; j++)

{

temp = seg7\_data & 0x80;

if(temp == 0x80)

IOSET0 |= 1 << 19;

else

IOCLR0 |= 1 << 19;

IOSET0 |= 1 << 20;

delay\_ms(1);

IOCLR0 |= 1 << 20;

seg7\_data = seg7\_data << 1;

}

}

IOSET0 |= 1 << 30;

delay\_ms(1);

IOCLR0 |= 1 << 30;

return;

}

void delay\_ms(unsigned int j)

{

unsigned int x,i;

for(i=0;i<j;i++)

{

for(x=0; x<10000; x++);

}

}

**5 KEY BORD**

#include <lpc214x.h>

#define LED\_OFF (IO0SET = 1U << 31)

#define LED\_ON (IO0CLR = 1U << 31)

#define COL0 (IO1PIN & 1 <<19)

#define COL1 (IO1PIN & 1 <<18)

#define COL2 (IO1PIN & 1 <<17)

#define COL3 (IO1PIN & 1 <<16)

void delay\_ms(unsigned int j);

void uart\_init(void);

unsigned char lookup\_table[4][4]={

{'0', '1', '2','3'},

{'4', '5', '6','7'},

{'8', '9', 'a','b'},

{'c', 'd', 'e','f'}};

unsigned char rowsel=0,colsel=0;

int main( )

{

uart\_init();

IO0DIR |= 1U << 31 | 0x00FF0000;

LED\_ON; delay\_ms(500);LED\_OFF;delay\_ms(500);

do

{

while(1)

{

rowsel=0;IO0SET = 0X000F0000;IO0CLR = 1 << 16;

if(COL0==0){colsel=0;break;};if(COL1==0){colsel=1;break;};

if(COL2==0){colsel=2;break;};if(COL3==0){colsel=3;break;};

rowsel=1;IO0SET = 0X000F0000;IO0CLR = 1 << 17;

if(COL0==0){colsel=0;break;};if(COL1==0){colsel=1;break;};

if(COL2==0){colsel=2;break;};if(COL3==0){colsel=3;break;};

rowsel=2;IO0SET = 0X000F0000;IO0CLR = 1 << 18;

if(COL0==0){colsel=0;break;};if(COL1==0){colsel=1;break;};

if(COL2==0){colsel=2;break;};if(COL3==0){colsel=3;break;};

rowsel=3;IO0SET = 0X000F0000;IO0CLR = 1 << 19;

if(COL0==0){colsel=0;break;};if(COL1==0){colsel=1;break;};

if(COL2==0){colsel=2;break;};if(COL3==0){colsel=3;break;};

};

delay\_ms(50);

while(COL0==0 || COL1==0 || COL2==0 || COL3==0);

delay\_ms(50);

IO0SET = 0X000F0000;

U0THR = lookup\_table[rowsel][colsel];

}

while(1);

}

void uart\_init(void)

{

PINSEL0 |= 0x00000005;

U0LCR = 0x83;

U0DLM = 0; U0DLL = 8; U0LCR = 0x03;

U0FCR = 0x07;

}

void delay\_ms(unsigned int j)

{

unsigned int x,i;

for(i=0;i<j;i++)

{

for(x=0; x<10000; x++);

}

}

**4 DAC CODE**

#include <lpc214x.h>

#include <stdio.h>

#define PLOCK 0x00000400

#define LED\_OFF (IO0SET = 1U << 31)

#define LED\_ON (IO0CLR = 1U << 31)

#define SW2 (IO0PIN & (1 << 14))

#define SW3 (IO0PIN & (1 << 15))

#define SW4 (IO1PIN & (1 << 18))

#define SW5 (IO1PIN & (1 << 19))

#define SW6 (IO1PIN & (1 << 20))

void SystemInit(void);

static void delay\_ms(unsigned int j);

short int sine\_table[ ] =

{512+0,512+53,512+106,512+158,512+208,512+256,512+300,512+342,512+380,512+413,

512+442,512+467,512+486,512+503,512+510,512+511,

512+510,512+503,512+486,512+467,512+442,512+413,512+380,512+342,512+300,512+256,512+208,512+158,512+106,512+53,512+0,

512-53,512-106,512-158,512-208,512-256,512-300,512-342,512-380,512-413,512-442,512-

467,512-486,512-503,512-510,512-511,

512-510,512-503,512-486,512-467,512-442,512-413,512-380,512-342,512-300,512-

256,512-208,512-158,512-106,512-53};

short int sine\_rect\_table[ ] =

{512+0,512+53,512+106,512+158,512+208,512+256,512+300,512+342,512+380,512+413,

512+442,512+467,512+486,512+503,512+510,512+511,

512+510,512+503,512+486,512+467,512+442,512+413,512+380,512+342,512+300,512+256,512+208,512+158,512+106,512+53,512+0};

int main()

{

short int value,i=0;

PINSEL1 |= 0x00080000;

IO0DIR |= 1U << 31 | 0x00FF0000 ;

while(1)

{

if (!SW2)

{

while (i!=60 )

{

value = sine\_table[i++];

DACR = ( (1<<16) | (value<<6) );

delay\_ms(1);

}

i=0;

}

else if (!SW3)

{

while ( i!=30 )

{

value = sine\_rect\_table[i++];

DACR = ( (1<<16) | (value<<6) );

delay\_ms(1);

}

i=0;

}

else if ( !SW4)

{

value = 0;

while ( value != 1023 )

{

DACR = ( (1<<16) | (value<<6) );

value++;

}

while ( value != 0 )

{

DACR = ( (1<<16) | (value<<6) );

value--;

}

}

else if ( !SW5 )

{

value = 0;

while ( value != 1023 )

{

DACR = ( (1<<16) | (value<<6) );

value++;

}

}

else if ( !SW6 )

{

value = 1023;

DACR = ( (1<<16) | (value<<6) );

delay\_ms(1);

value = 0;

DACR = ( (1<<16) | (value<<6) );

delay\_ms(1);

}

else

{

value = 1023;

DACR = ( (1<<16) | (value<<6) );

}

}

}

void delay\_ms(unsigned int j)

{

unsigned int x,i;

for(i=0;i<j;i++)

{

for(x=0; x<10000; x++);

}

}

**6 DC MOTOR**

#include <lpc214x.h>

#define LED\_OFF (IO0SET = 1U << 31)

#define LED\_ON (IO0CLR = 1U << 31)

#define PLOCK 0x00000400

void delay\_ms(unsigned int j);

void runDCMotor(int direction,int dutycycle);

unsigned int adc(int no,int ch);

int main()

{

int dig\_val;

IO0DIR |= 1U << 31 | 0x00FF0000 | 1U << 30;

LED\_ON; delay\_ms(500);LED\_OFF;

do{

dig\_val = adc(1,2) / 10;

if(dig\_val > 100) dig\_val =100;

runDCMotor(2,dig\_val);

}

while(1);

}

void runDCMotor(int direction,int dutycycle)

{

IO0DIR |= 1U << 28;

PINSEL0 |= 2 << 18;

if (direction == 1)

IO0SET = 1 << 28;

else

IO0CLR = 1 << 28;

PWMPCR = (1 << 14);

PWMMR0 = 1000;

PWMMR6 = (1000U\*dutycycle)/100;

PWMTCR = 0x00000009;

PWMLER = 0X70;

}

unsigned int adc(int no,int ch)

{

unsigned int val;

PINSEL0 |= 0x0F300000;

switch (no)

{

case 0: AD0CR=0x00200600|(1<<ch);

AD0CR|=(1<<24);

while((AD0GDR& (1U<<31))==0);

val=AD0GDR;

break;

case 1: AD1CR=0x00200600|(1<<ch);

AD1CR|=(1<<24);

while((AD1GDR&(1U<<31))==0);

val=AD1GDR;

break;

}

val=(val >> 6) & 0x03FF;

return val;

}

void delay\_ms(unsigned int j)

{

unsigned int x,i;

for(i=0;i<j;i++)

{

for(x=0; x<10000; x++);

}

}