Lampiran 2

PROGRAM UTAMA

START

INISIALISASI

TAMPILAN
MENU Pilihan

MENENTUKAN
Pilihan

Pilihan=1

V

HITUNG FOKUS

T

Pilihan=2

V

TAMPIL HASIL

T

Pilihan=3

V

ATUR POSISI
MOTOR

T

Pilihan=4

V

END

T
START

HASIL UKUR LENSA IES POSITIP

BESAR FOKUS LENSA

END

PROGRAM TAMPIL HASIL
PROGRAM ATUR POSISI

START

TAMPILAN MENU PILIHAN

MENENTUKAN PILIHAN

PILIHAN → V

GESER MAJU

T

PILIHAN → V

GESER MUNDUR

PILIHAN = ESC

END

T

V
```c
#include <dos.h>
#include <stdio.h>
#include <math.h>

void fokus(void);
void tampil(void);
void menu_pilihan(void);
void posisi(void);

int c;
int AA = 50;

main()
{
    outportb (0x307,0x98); /* Inisialisasi 8255 */
    menu_pilihan();
}

void menu_pilihan()
{
    char pilihan;
    clrscl();
    gotoxy(20,12);
    puts("************* MENU PILIHRAN *************");
    gotoxy(20,14);
    puts("** [1] Mencari jarak fokus lensa **");
}```
gotoxy(20,18);
**");
gotoxy(20,18);
**");
gotoxy(20,20);
puses("** [4] Salesai
**");
gotoxy(20,22);
puses("*******************************");
gotoxy(20,24);
printf(" Pilihan anda (1...4) : ");
do
   pilihan=getch();
   while ( pilihan < '1' || pilihan > '4');
   printf("%c\n\n",pilihan);
   switch(pilihan-'0')
   {
   case 1 : clrscr();
            fokus();
            break;
   case 2 : clrscr();
            tampil();
            break;
   case 3 : posisi();
            break;
   case 4 : exit(0);
   }
}
void fokus()
{
    int i, t;
    unsigned int x[2];
    extern int AA;

    outportb(0x305, 0);
    outportb(0x305, 8);
    delay(100);
    outportb(0x305, 0);

    do
    {
        t = inportb(0x306);
        delay(200);
    }
    while(t == 0);

    for(i=0; i<3; i++)
    {
        x[1] = inportb(0x304);
        delay(200);
    }

gotoxy(10,5);

printf("Nilai awal : %d \n", x[1]);
gotoxy(10,10);
printf("Pasanglah lensa tes positip !.");

getch();
delay(1000);

outportb(0x305,0);
outportb(0x305,8);
delay(100);
outportb(0x305,0);

doi
{
   t = inportb(0x306);
delay(200);
}
while(t == 0);

for(i=0;i<3;i++)
{
   x[2]=inportb(0x304);
delay(200);
}

if (x[2] < x[1])
{
   c=0;
do
{
    outportb(0x306,3);delay(AA);
    outportb(0x306,8);delay(AA);
    outportb(0x306,12);delay(AA);
    outportb(0x306,9);delay(AA);

    outportb(0x305,0);
    outportb(0x305,8);
    delay(100);
    outportb(0x305,0);

    do
    {
        t = inportb(0x306);
        delay(200);
    }
    while(t == 0);

    for(i=0;i<3;i++)
    {
        x[2]=inportb(0x304);
        delay(200);
    }

    gotoxy(10,7);
printf("Nilai akhir: %d ", x[2]);
c++;
}while(x[2] != x[1]);

outportb(0x308,0);

for (i = 1; i<=c; i++)
{
    outportb(0x308,9); delay(AA);
    outportb(0x308,12); delay(AA);
    outportb(0x308,8); delay(AA);
    outportb(0x308,3); delay(AA);
}
outportb(0x308,0);
menu_pilihan();

}
else
{
    clrscr();
    outportb(0x306,0);
gotoxy(10,5);
printf("Periksa lagi, mungkin ada kesalahan!.");
delay(3000);
menu_pilihan();
}
}
void tampil()
{
    float f1;
    extern int c, AA;

    f1 = (float)c * 4 * 0.005;

gotoxy(10, 15);

printf("Jarak pergeseran sumber cahaya : \%0.2f mm", f1);

gotoxy(10, 17);

if (f1 != 0)
    printf("Fokus lensa ; \%d", 2500/(int)f1);
else
    printf("Fokus lensa = 0");

getch();
menu_pilihan();
}

void posisi()
{
    extern int AA;
    char pilihan;
    clrsr();
gotoxy(20,8);
puts("************** MENU PILIHAN ***************");
gotoxy(20,10);
cprintf("** %c Geser Maju **\n",’A’);
gotoxy(20,12);
cprintf("** %c Geser Mundur **\n",’B’);
gotoxy(20,14);
puts("** Esc Selesai **");
gotoxy(20,16);
puts("****************************************************************************");
gotoxy(20,18);

for(;;)
{
  outportb(0x306,0);
pilihan=getch();
if(!pilihan);
pilihan=getch();
switch(pilihan)
{
case 77 : outportb(0x306,3);delay(AA);
  outportb(0x308,6);delay(AA);
  outportb(0x308,12);delay(AA);
  outportb(0x308,9);delay(AA);
  gotoxy(55,2);
  printf("Maju ");
  break;
case 75 : outportb(0x308,9);delay(AA);
outportb(0x306,12);delay(AA);
outportb(0x306,6);delay(AA);
outportb(0x306,3);delay(AA);
gotoxy(55,2);
printf("Mundur ");
break;

case 27 : clrscr();
    menu_pilihan();
}
}
}
PC BOARD LAYOUT

The high-quality, single-ended, analog signal ground connection for the entire system, in a multi-ground layer, minimizes the presence of ground loops, which would otherwise interfere with the signal integrity of the board. The ground plane is designed to be as large as possible to minimize the effects of ground loops. The ground plane is connected to the power supply through low-inductance traces to ensure a clean power supply to the system. The ground plane is also connected to the evaluation board through low-inductance traces to ensure a clean evaluation board power supply.

The power supply is a 12VDC input, and the converter board is mounted on top of the power supply. The power supply is designed to be as small as possible to minimize the effects of ground loops. The power supply is connected to the converter board through low-inductance traces to ensure a clean power supply to the converter board.

The converter board is designed to be as small as possible to minimize the effects of ground loops. The converter board is mounted on top of the power supply, and the power supply is designed to be as small as possible to minimize the effects of ground loops. The converter board is connected to the power supply through low-inductance traces to ensure a clean power supply to the converter board.

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where $I_{gs}$ is the 25μA leakage current, $I_{o}$ is the current through all the transistors, and $I_{ds}$ is the current in the reference. $R_1$ and $R_2$ should be well matched and leak each other over temperature.

For small values of reference voltage, the reference could be replaced by a resistor, but due to heating and temperature problems, these resistors should be buffered to the REF+ and REF− inputs. Figure 5. The power supply must be well bypassed as output glitch would otherwise be applied to the reference inputs. The reference voltage magnitude is:

$$V_{ref} = V_{DD} \times \left( \frac{R_2}{R_1 + R_2} \right) \text{ For } \frac{R_1}{R_2} > 1$$

There are several op amps that can be used for buffering this input. Without setting a new output, an LDMOS could be used if the REF+ input is not to be set above 3.5V. The LDMOS can easily be the reference switch and can be used if a higher $V_{ref}$ voltage is needed.

As the REF+ to REF− voltage decreases the incremental voltage step size decreases. At 5V one LSB represents 20 mV, but at 1V one LSB represents 4 mV. As the reference voltage decreases, system noise will become more significant to greater precision should be ensured at lower voltages to compensate for system noise, i.e., adequate supply and reference bypassing, and physical as well as electrical isolation of the inputs.

2.2 Absolute Analog Inputs

The ADC0808/ADC0809 may have been designed to work with 8-bit microprocessors, but this does not preclude the use of non-polarized inputs. A second type of input is the absolute input, which is independent of the reference. This requires that its absolute numerical voltage value is very nearly equal to the accuracy of the reference voltage. In Figure 5, the absolute input is used with its absolute input signal. If the system needs only one power supply, an op amp can be used as shown in Figure 5 to isolate the reference and boost the supply current capabilities. Here again, a single unregulated supply is required.

In some small systems, it is possible to use the provision of both power supplies as shown in Figure 7. An unregulated supply voltage > 5V is required, but the LMC6036-5.0 functions as both a regulator and reference. The dropping resistor $R_1$ must be chosen so that, for the whole range of supply currents needed by the system, the LMC6036-5.0 will stay in regulation. As in Figure 6, separate supply and reference sources should be used to maintain a noiseless supply.

2.3 Differential Inputs

Differential measurements can be obtained by applying a signal to the reference. The input signals are sequentially coming in two channels, then subtracting the two results. For example, a differential voltage between channel 1 and channel 2 could be measured, thereby canceling out the common mode signal. Then connect channel 3, input the result, and subtract. Then connect channel 4, input the result, and subtract. Then connect channel 5, input the result, and subtract. Then connect channel 6, input the result, and subtract. Then connect channel 7, input the result, and subtract. Then connect channel 8, input the result, and subtract.

Figure 8 shows the procedure. Each input signal must be stable throughout both - the reference and the amplifiers which amplify the input signal must be isolated, and the results will be incorrect. One way to get around this is to use two sample/hold circuits which are triggered at the same time.
A second method to use two chips to convert a differential channel, Figure 16. Typically each channel 1 would be connected to opposite sides in the differential I/O. Both converters are started simultaneously when both converter 1's ECC outputs go high. The output of the AND gate will go high indicating that the data is ready to be read.

The circuit in Figure 16 can be slightly modified to provide increased data throughput by using two converters in a parallel data acquisition scheme. Figure 17 shows the circuit in which all the input channels are connected in common through a 600:1 multiplexer. Under normal operation a sample/hold is increased through an MULTI Gate which will operate a MAX2452, generating a sample output. After a sample/hold is done sampling the signal, the appropriate channel is selected. If the process is altered between two converters the sample rate can be doubled.

2.4 Analog Input Considerations

Analog inputs to the APO089/AD8091 can handle any input signal that is maintained within the supply limits, but some careful consideration must be given to the input impedance of the transmitter or buffer. Using transmitters with large source impedances can cause errors due to consideration of input current.

To understand the nature of these currents a short circuit of the comparator's output is required. Figure 18 shows a simplified model of the comparator and multiplexer. The comparator alternately samples the input voltage and the voltage at the input. As it samples the input, Cg and Cg are charged up to the input voltage. Then switches the load and charge the capacitor. The input voltage is determined by a modified inverter channel and results in a 0 or a 4.5 voltage at the input.

Eight samples are made per conversion, resulting in eight edges on the base line of the output.

If the source resistance is large, it will be in the RC time constant of the switched capacitor which will affect the input signal in a frequency error. As one might expect, the maximum source resistance allowed for accurate conversions is inversely proportional to clock frequency. The resistance should be ≤ 15 kΩ at 1 MHz and ≤ 10 kΩ at 2 MHz.

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If true decoding is not available, then START and ALE could be tied together. To obtain the proper delay, the microprocessor would cause START/ALE to be stroked hence by executing the first and set instruction blocks. The last time this instruction was executed, the new address is loaded to the cominations stored. The second execution of the instruction will readdress the same channel address and reassert the conversion. But since the multiplexer address registers remain unchanged, the selected analog input will have already switched to the line the second instruction is issued. Actual implementations of these ideas are shown in following sections.

A third possibility when ALE and START are tied together is to switch the microprocessor enabled ALE/START pulse by placing a one-shot at these inputs and creating a positive pulse of 2 μs. Since ALE has the multiplexer inputs on the positive going edge of the pulse and START begins the conversion on the falling edge, the end of the pulse sets the ALE and START delay timer.

Most microprocessor interfaces would be designed such that a START pulse is sent by a memory I/O write instruction, although a memory I/O read can be used. The ALE code on the other hand, requires a write by the CPU when A, B, and C are connected to the data bus, and could use a read instruction (A, B, and C are connected to the address bus, but the software would get confusing. The logic to derive the OE strobe must be connected to the microprocessor so that a memory or I/O write instruction would cause OE to be pulled. A read is required since the ADC0808/9 data must be read.

3.1 Interfacing to the 8080

The simplest interface would contain no address decoding, which may seem unsuitable, but if the system ports are not used, the A, B, C, and D ports can be connected with no decoding. Each of the A, B, C, and D address lines will serve as a simple port enable line which would be parsed, and these signals to select a particular port. The scheme is shown in Figure 12. A, B, and C are address lines to a memory, whereas D is a data line and D is a memory port. The implementation simplifies A, B, C, and D, which is a 60/922, 122 memory, causing the information on the data bus to be read by the address bus, with a loss of only 3 ports: decoding schemes are illustrated in Figure 14 (Elements A, B, C inputs are used when selecting a channel output, and are not used to read data.)

Two 74LS138 gate arrays are used to generate the A, B, C, and D port decoding schemes. When the 8080 writes to A, B, C, and D, it should be stabilized, reading and writing the appropriate when C is asserted. The 8080 transfers A, B, C, and D, and the data outputs are enabled.
This document submission is intended to be read only for purposes of institutional repository format for the security, backup and recovery. The author(s) or copyright owner(s) agree that UNDIP-IRepon may, with agreement that UNDIP-IRepon may keep more content, translate than one copy of this document using a single interrupt context where EOC is tied directly to the 8080 interrupt input. When the ING282 is used and the IN7A pin in tied high through a 1 kΩ resistor, the interrupt will cause a reset, P1.1, instruction to be executed, which will then cause a jump to a reset vector and execution of the interrupt routine. It is a single interrupt context where a simple interrupt system is desired, a wire OR interface configuration employing rendezvous latches as shown in Figure 13.4a can be used. In the simple design the IN7A line is reset when the ADC0808/ADC0809 data is read. More complicated interrupt structures are required than an interrupt controller is usually the best solution.

The I/O port address structure for Figure 13.1's implementation is shown as shown in Figure 14a. If the A, B, C module are tied to A1, A2, A3, E and the port selection line or data are tied to A4, the 8-bit module can be tied to the module's A port address where channel is selected by the 3-bit status word written to the 8-bit data bus. Figure 12 shows a slightly more complex interface, where the address is partially decoded by the 8-bit module. In the case where the encoder is not used, the CPU can be connected to the encoder, and the data is written to the module's A port address where channel is selected by the 3-bit status word written to the 8-bit data bus.

ADC0808/9 with 8-channel analogue multiplexer
2.2 286 Interface

Interfacing the 286 to the ADC0808 is much the same as interfacing to an 8080/8085/8086 CPU group. CPU operation timing is very similar, except the interrupt and control signals are slightly different. Instead of M7 remaining high while the 8086 waits for a clock, there is no active low, and enabled interrupt and RD DIs assumed.

UTILITY ROUTINES FOR ADC0808/ADC0809 INTERFACE

LOAD AND START CONVERSION (FIGURE 18)

STATUS
DATA
EQU $D000
EQU $D060

START
DATA
EQU $D060

SELECT CHANNEL 0 AND START
DO AGAIN TO LET INPUTS SETTLE
LOAD INTERRUPT VECTOR ADDRESS
EXECUTE MISC PROGRAM
ENABLE INTERRUPT IF NOT ALREADY
EXECUTE MISC PROGRAM
WAIT FOR INTERRUPT

* INTERRUPT HANDLER (FIGURE 18)

VECTOR
LOAD DATA INTO INTERRUPT VECTOR
ENABLE INTERRUPT (OPTIONAL)
EXECUTE PROGRAM
RETURN TO MAIN PROGRAM

ADC0808/9 with 8-channel analogue multiplexer
An Electronic Watt-Watt-Hour Meter

The continued emphasis on energy conservation has forced designers to consider the power consumption and efficiency of their products. Where equipment for the industrial market must be designed with attention toward these factors, the consumer looks at even more closely. The high cost of electricity has prompted a great deal of interest in the design of energy-efficient appliances. The watt-hour meter illustrated in Figure 2 allows the designer to easily determine power consumption of any 120V AC powered device. The extremely wide dynamic range of the design allows measurements of loads ranging from 0.06 to 2000W.

Conceptually, the instrument is quite straightforward (Figure 3). The device to be monitored is plugged into a standard 120V AC outlet which is mounted on the front panel of the instrument. The AC line voltage across the monitored load is divided down and fed via an op amp to one input of a four-quadrant analog multiplier. The current through the load is determined by the voltage across a low resistance shunt. Even at 25A the shunt resistance, only 120mΩ, remaining the voltage it produces a high resistance current shunt would constitute. The single shunt is used for all ranges, eliminating the need to switch in high impedance shunts to obtain adequate signal levels on the high sensitivity scales. This provision is made possible by low uncertainty in the current amplifier, whose output feeds the other multiplier.
Gambar 11.2 Blok diagram 8255.