LAMPIRAN A

PROGRAM CODEVISION

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PROGRAM CODEVISION AVR

```
#include <mega16.h>
#include <delay.h>
#include <stdio.h>
int waktuX1 = 0;
int waktuX2 = 0;
int waktuX1X2 = 0;
int start = 0;
int end = 0;
float waktuTotal = 0;
float kecepatan = 0;
char buffer1[16];
char buffer2[16];

// Alphanumeric LCD Module functions
#asm
   .equ __lcd_port=0x15 ;PORTC
#endasm
#include <lcd.h>

// Declare your global variables here
void ulang()
{
start = 0;
end = 0;
waktuX1 = 0;
waktuX2 = 0;
waktuX1X2 = 0;
kecepatan = 0;
waktuTotal = 0;
lcd_clear();
PORTB = 0xff;
}
void main(void)
{
// Declare your local variables here
// Input/Output Ports initialization
// Port A initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
```

```
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
PORTA=0x00;
DDRA=0x00;

// Port B initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
PORTB=0xff;
DDRB=0xff;

// Port C initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
PORTC=0x00;
DDRC=0x00;

// Port D initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
PORTD=0x00;
DDRD=0x00;

// Timer/Counter 0 initialization
// Clock source: System Clock
// Clock value: Timer 0 Stopped
// Mode: Normal top=FFh
// OC0 output: Disconnected
TCCR0=0x00;
TCNT0=0x00;
OCR0=0x00;

// Timer/Counter 1 initialization
// Clock source: System Clock
// Clock value: Timer 1 Stopped
// Mode: Normal top=FFFFh
// OC1A output: Discon.
// OC1B output: Discon.
// Noise Canceler: Off
// Input Capture on Falling Edge
// Timer 1 Overflow Interrupt: Off
// Input Capture Interrupt: Off
// Compare A Match Interrupt: Off
// Compare B Match Interrupt: Off
```

```
TCCR1A=0x00;
TCCR1B=0x00;
TCNT1H=0x00;
TCNT1L=0x00;
ICR1H=0x00;
ICR1L=0x00;
OCR1AH=0x00;
OCR1AL=0x00;
OCR1BH=0x00;
OCR1BL=0x00;

// Timer/Counter 2 initialization
// Clock source: System Clock
// Clock value: Timer 2 Stopped
// Mode: Normal top=FFh
// OC2 output: Disconnected
ASSR=0x00;
TCCR2=0x00;
TCNT2=0x00;
OCR2=0x00;

// External Interrupt(s) initialization
// INT0: Off
// INT1: Off
// INT2: Off
MCUCR=0x00;
MCUCSR=0x00;

// Timer(s)/Counter(s) Interrupt(s) initialization
TIMSK=0x00;

// Analog Comparator initialization
// Analog Comparator: Off
// Analog Comparator Input Capture by Timer/Counter 1: Off
ACSR=0x80;
SFIOR=0x00;

// LCD module initialization
lcd_init(16);


while (1)
    {
    lcd_gotoxy(0,0);
    lcd_putsf("Waiting... ");
    delay_ms(50);
```

```
    while(PINA.0 == 0)
    {
    waktuX1 += 1;
    delay_ms(10);
    start = 1;
    }
    while(start == 1)
    {
     while(PINA.7 == 1)
     {
     waktuX1X2 += 1;
     delay_ms(10);
     }
     start = 2;
    }
    while(start == 2)
    {
     while(PINA.7 == 0)
     {
     waktuX2 += 1;
     delay_ms(10);
     }
     end = 1;
     start = 0;
    }
    while(end == 1)
    {
    waktuTotal = ((float)waktuX1 + (float)waktuX2 + (float)waktuX1X2) / 100;
    kecepatan = 1 / waktuTotal;
    sprintf(buffer1,"V: %0.002f Km/H ",kecepatan*3.6);
    lcd_gotoxy(0,0);
    lcd_puts(buffer1);
    delay_ms(10);
    sprintf(buffer2,"S: %0.002f cm ",kecepatan*((float)waktuX1));
    lcd_gotoxy(0,1);
    lcd_puts(buffer2);
    //masukin program if di baris ini bt buzzer
    if(kecepatan > 1.1)PORTB=0xfe;
    delay_ms(2000);
    ulang();
    }
    };
}
```

LAMPIRAN B

DIAGRAM SKEMATIK

LAMPIRAN B

DIAGRAM SKEMATIK

B.1. *ATMega* 16