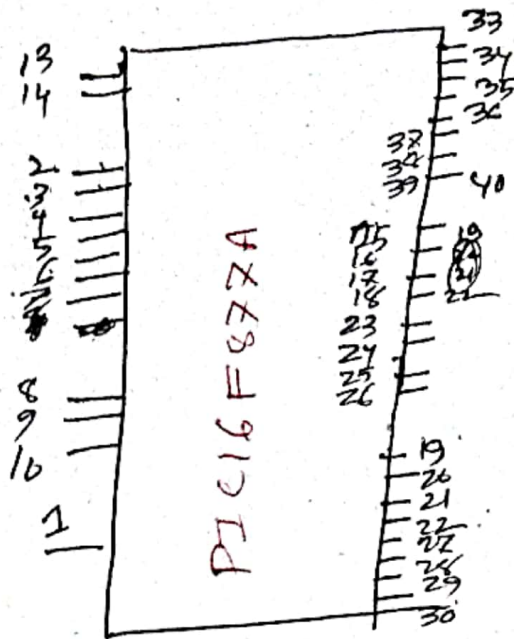


0b → binary
0x → Hexadecimal



- 21 Input pin → 40K
- 21 operating voltage
→ 2 to 5.5V
- 61 Number of input
pin → 33K
- Computer → 2K
- 81 memory types

1 → Input / pic to pic voltage

2, 3, 4, 5, 7, 8, 9, 10 → Analog PIC

6 → 4th pin of port A

13 → Oscillator / clock input pin

14 → Oscillator / clock output pin

16, 17 (RC1, RC2) → PWM pin

16, 17 (RC1, RC2) → PWM pin

25 (RC6) Transmitter pin

26 (RC7) Receiver pin

V_{DD} → positive

V_{SS} → Ground

Flash memory

61 Data EEPROM

→ 256 bytes

91 General output

pin source 25mA

current limiting

2006 mm

* 33-40, 15, -4V + 5,

19 (21K - 4V + 5)

320 port initially Digital ground pin

Digital define error. portb = 0x00 value 2V.

while(1) → endless loop

90 = 60

current limiting

Register

1. LED Blinking:

1. small, powerful light, it is an electronic device

2. LED जल्दी-बंद (बंद) कर सकते हैं जो बहुत कम मात्रा में प्रवाह कर सकते हैं। Current प्रवाह 2V, 10mA

* जो बंद कर सकते हैं। चिह्न (+) Anode, (-) Cathode (+) Cathode (-) Anode (+)

2. One digit 7 segment:

32 → 9.4

1. 7 segment display जल्दी output display करें, image or digit decimal number display करें।

2. एक alternative display of complex dot matrix display.

3. उपयोग: Digital clock, basic calculator, electronic meter.

4. एक LED जो light emitting diode जल्दी कर सकते हैं।

5. 2 प्रकार: Common anode display, Common cathode display

6. OP → Dot pixel.

Common anode display: C A F E D C B A

1. more popular than CC जल्दी जल्दी source (जल्दी) sink कर सकते हैं।

2. Connected together to logic 1, We use 0 then it turn on.

3. जल्दी LED reverse bias Connected.

* Common cathode display:

जल्दी

81 7-segment (Two digit):

1 multiplexing technique is used for drive multiple 7-segment display

21 Two digit 7-segment display \rightarrow 20% pin

\rightarrow \rightarrow For First digit \rightarrow For 2nd digit

\rightarrow 0 - 1111 001.

61 multiplexing helps to reduce power.

* button click \rightarrow 1 - 1111 1111

61 A/D

A/D

21 Convert A \rightarrow D

21 ATD \rightarrow Analogue voltage to binary number. (2, 4, 8, 10-bit)

61 Analogue input voltage to Binary representation

Triangle method

$$\rightarrow X = \frac{1024 * (\text{output value})}{5} \quad 0.5V \rightarrow 1024 \text{ levels}$$

81 A/D converter can divide analogue input voltage (0 to 5V) into 256 \rightarrow 1024 levels approx.

POT-Hg: Potentiometer is a 3 terminal resistor

21 It is an instrument for measuring voltage

5. Push button:

- 1) Button a click \rightarrow 1 state.
- 2) 500ms press \rightarrow state set 225.
- 3) \rightarrow input device
- 4) Use two type of resistor (pull-up & pull down)
- 5) Pull down connect to the ground. (press \rightarrow logic high)
- 6) pull up \rightarrow VCC (press \rightarrow logic low)

6. Dot matrix:

- 1) consisting light emitting diode.
- 2) symbol, character, alphabets, numbers
- 3) Types \rightarrow 5×7 , 6×8 , 6×6 , 16×6 , 32×8 , 64×64
- 4) Row anode/cathod, column anode/cathod
- 5) ULN2803 \Rightarrow Darlington transistor (#)
High current
 $500mA / 50V$
B port \rightarrow input
C port \rightarrow output
- 6) Port D \rightarrow column data
Port A \rightarrow Row data (variation)

7. LM-35:

- 1) LM-35 \rightarrow Temperature measuring device (output voltage temp)
- 2) Temperature provided in $^{\circ}\text{C}$ and $^{\circ}\text{F}$.
- 6) ~~10mV~~ 10mV/degree.
- 8) It is 3-terminal sensor (-55°C to 150°C) measure
- * LM016L \Rightarrow ~~(4 pin)~~ (2x16) LCD
- 1. VSS (Power supply (~~GND~~))
- 2. VDD (Power supply 5 volt)
- 3. VEE (contrast adjust)
- 4. RS = instruction / data input
- 5. RW (read/write)
- $D_0 - D_7 \rightarrow$ data bus pin

8. Relay:

- 1) Relay = 50mA ^{100mA} 12V relay coil and pin,
- 2) Transistor (NPN)
- 6) PIC 25mA relay coil and 50mA relay coil
- Transistor relay and 2V
- 8) General purpose diode (Reverse bias) 1 (25mA)
- Coil and (25mA) coil and 2V
- \rightarrow Forward bias of VCC and Transistor 12V, huge current 25V, circuit damage 2V,
- AC = 310 Amplitude $\rightarrow 220 \times \sqrt{2}$
Frequency = 50 Hz.

Q: PWM:

- Q1 PWM is a type of signal, (2nd Digital IC over 2nd sem)
- 225, (2nd sem 555, microcontroller)
- Q2 Square wave is a signal produced by 225,
(1) signal stay high is called on time. and low is off time
- Q3 Signal always on \rightarrow (PWM signal remains high) \rightarrow 100% duty cycle
always off \rightarrow 0% duty cycle

Q4 Duty cycle =
$$\frac{\text{Turn on time}}{\text{Turn on time} + \text{turn off time}}$$

- Q5 Duty cycle control is used, on time of signal control.

Q6 225, \therefore Time period = on time + off time

Q7 Frequency =
$$\frac{1}{\text{Time period}}$$

L293D:

1. Supply voltage range 4.5V to 36V
2. Output current (1A) & Peak current 3A
3. 2X motor control. 225

PWM \rightarrow is a technique, for getting analog results with digital.

or ~~technique~~ ^{square wave} ~~technique~~ analog signal. (2nd digital)

Signal. 225 ~~technique~~ (2nd) switched between on and off.

$$\begin{aligned} \text{Duty cycle} &= \frac{255}{127} \times 100 = 50\% \quad \frac{255}{64} \times 100 = 25\% \\ &= \frac{255}{127} \times 100 = 75\% \end{aligned}$$

10. Servo motor:

- 1) Operates upon instruction. ଏହା ଏକ (ଆମ) - motor (ଆମ) କଲେକ୍ଟର
- 2) ଏହା ଏକ singular precision provides. ଏହା ଏକ ସିଙ୍ଗୁଲାର ପ୍ରିସିଜନ ପ୍ରୋଭାଇଡସ୍
- 3) ଏହା ଏକ ସରଳ ନିୟନ୍ତ୍ରଣ instruction ନିୟନ୍ତ୍ରଣ ଦେଇ।
- 4) ଏହା ଏକ: Robotic, arms, legs etc. Aeroplane,
- 5) ଏହା ଏକ wire କଲେକ୍ଟର (Red, Black and power signal control wire)
- 6) ଏହା ଏକ $(0-180^\circ)$ rotate 2V, $\Rightarrow 0^\circ \Rightarrow 500 \mu s$ delay $\Rightarrow 180^\circ \Rightarrow 2200 \mu s$ delay
 $\Rightarrow 90^\circ \Rightarrow 1500 \mu s$ delay
- 7) ଏହା ଏକ freely rotate 2V, High torque

1.1. Stepper motor:

1) The rotation of number of equal steps

2) 52 gear. \rightarrow ① Unipolar, Bipolar

\rightarrow Unipolar is most popular for operation / variable speed

3) Unipolar. 3 gear. \rightarrow wave / Half / Full

Wave drive: \rightarrow 4 1/2 step \rightarrow 6/8 wire \rightarrow full rotation complete

(i) low torque

(ii) power consumption is important

low loss

Half wave: The angular resolution increase of 50%
 Torque is 70% of full wave

Bipolar motor:

1) 52 coil (4 wire)

2) The unipolar is for complex drive

(3/4)

* Bipolar & Unipolar motor - same coil resistance

(0 - 360)° rotate

\rightarrow 90° rotate

