

8051 Interfacing with Washing Machine

What Is a Washing Machine?

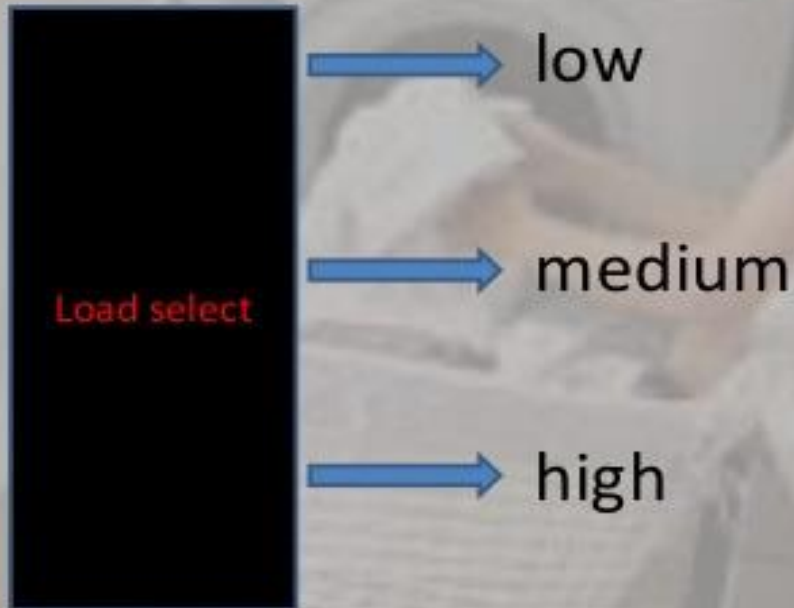
- A washing machine is an electronic device that is designed to wash laundry like clothes, sheets, towels and other bedding.
- A washing machine is built with two steel tubs which are the inner tub and the outer tub whose main role is to prevent water from spilling to other parts of the machine.

Control knobs in washing machine

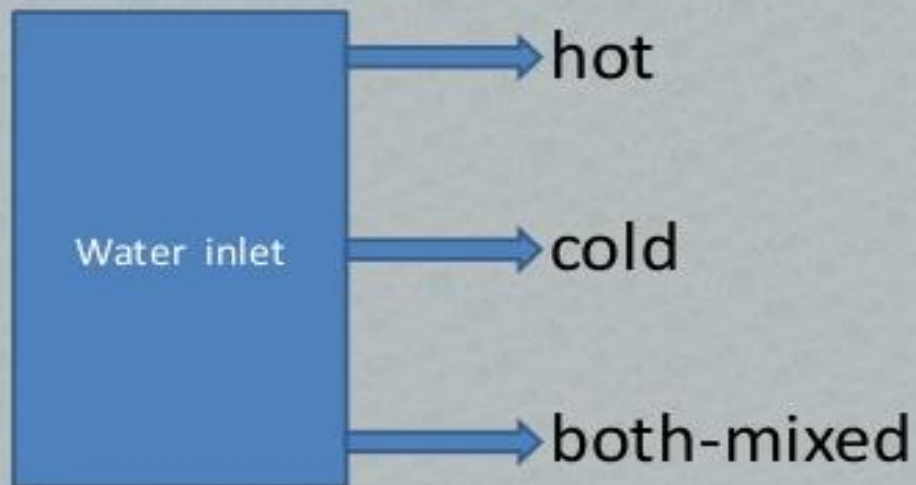
- ❖ Load select knob
- ❖ Water inlet select knob
- ❖ Mode select knob
- ❖ Program select knob

Load select knob:-

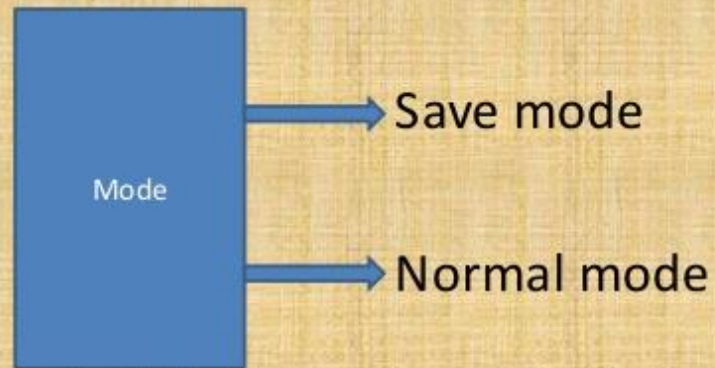
load → Number of clothes



Water inlet select knob:-



Mode select knob:-



Program select knob:-

Heavy → Clothes very dirty

Normal → Normal dirty clothes

LIGHT → For light dirty clothes

Delicate → For silk clothes

Operations:-

- Fill:- water will be filled by the pump as per the load knob selected.
- Agitate:- The wash basket will rotate in a clockwise direction for 10 revolutions, After that basket will stop for 2 seconds, then rotate 10 revolutions in anticlockwise direction. The process will be continued for specified minutes in cycle table.

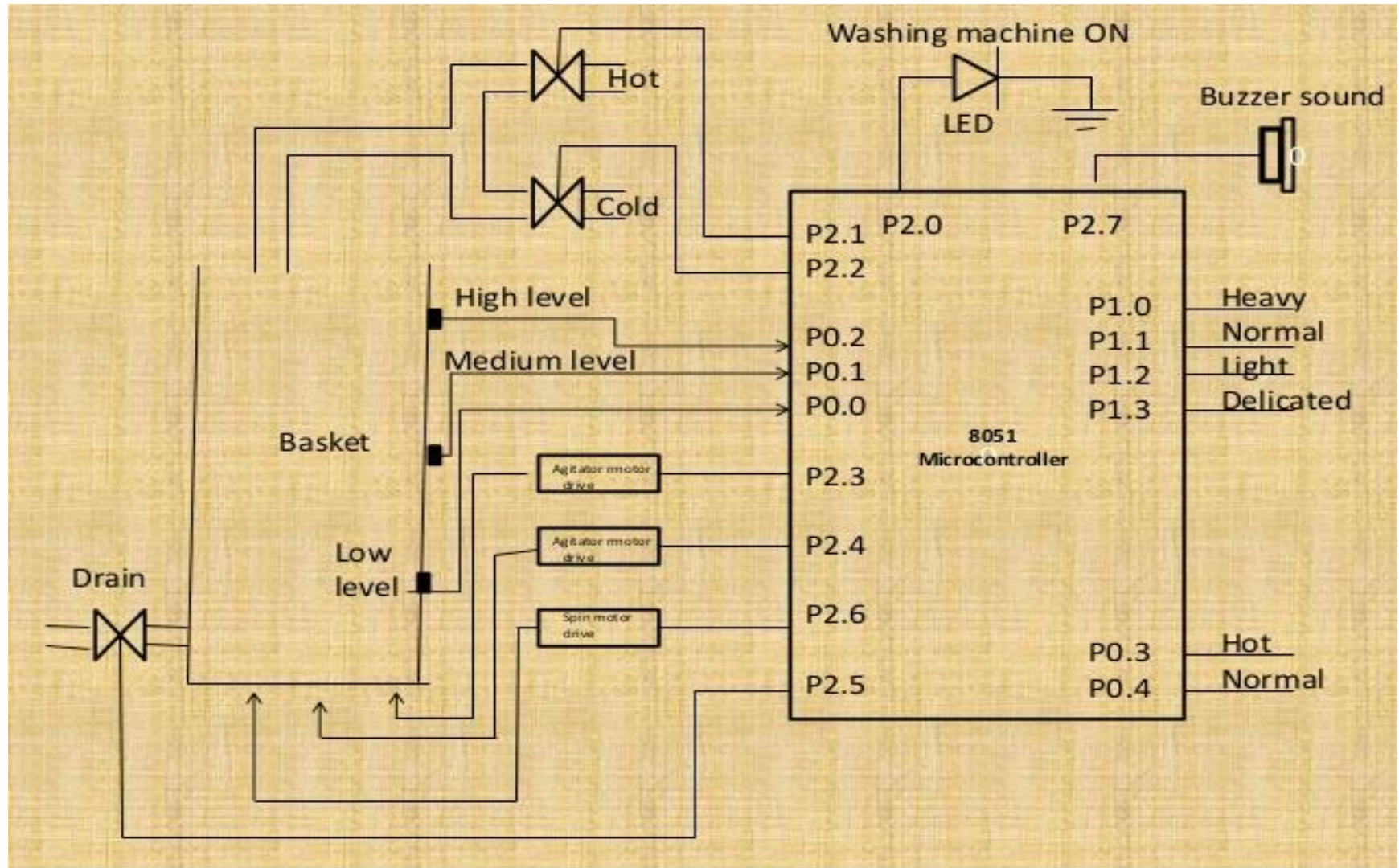
- Drain:- After agitation, the water and detergent are drained.
- Spin:- During spin, agitator will be stationary, only the basket will rotate at high speed. Then the moisture of clothes are removed through holes in the inner metallic basket.
- Indicator:- Machine ON \longrightarrow LED ON

After completion of washing cycle, buzzer sound will be generated.

Washing cycle for Heavy, Normal, Light and Delicate setting

Operation	Heavy	Normal	Light	Delicate
Fill water	Set by load Select knob	Set by load Select knob	Set by load Select knob	Set by load Select knob
Agitate	20 minutes	15 minutes	10 minutes	5 minutes
Drain	5 minutes	5 minutes	5 minutes	5 minutes
Fill water	Set by load Select knob	Set by load Select knob	Set by load Select knob	Set by load Select knob
Agitate	10 minutes	10 minutes	5 minutes	5 minutes
Drain	5 minutes	5 minutes	5 minutes	5 minutes
Spin	10 minutes	10 minutes	5 minutes	5 minutes

Circuit diagram



Operation	Signal	Input/output	Port pin no.
Load / water level select	Water level low	Input	P0.0
	Water level med	Input	P0.1
	Water level high	Input	P0.2
Water inlet	Hot water knob	Input	P0.3
	Normal water knob	Input	P0.4
Program select	Heavy	Input	P1.0
	Normal	Input	P1.1
	Light	Input	P1.2
	Dedicate	Input	P1.3
Machine ON	Machine on indic	Output	P2.0
Fill water	Hot water inlet	Output	P2.1
	Normal water inlet	Output	P2.2
Agitation control	Motor rotate in cloc direction	Output	P2.3
	Motor rotate in anticlock direc	Output	P2.4
Drain	Drain valve open	Output	P2.5
Spin	Spin motor ON/OFF	Output	P2.6
Washing ccomplete	Washing comp indic	Output	P2.7

Put machine ON

Fill machine with water hot or normal

Check program setting

Agitate
20 min

Drain
5 min

Fill water

Agitate
10 min

Drain
5 min

Spin
20 min

Buzzer for
wash
complete

Agitate
15 min

Drain
5 min

Fill water

Agitate
10 min

Drain
5 min

Spin
10 min

Buzzer for
wash
complete

Agitate
10 min

Drain
5 min

Fill water

Agitate
5 min

Drain
5 min

Spin
5 min

Buzzer for
wash
complete

Agitate
5 min

Drain
5 min

Fill water

Agitate
5 min

Drain
5 min

Spin
5 min

Buzzer for
wash
complete

Commands for washing-machine controller

Labels	Mnemonics	Operands	Comments
	SETB LCALL	P2.0 FILL_1	Machine ON indication Machine fill with water 1 st time
	JNB	P1.0,LOOP_1	Chk prog setng knob for heavy. if P1.0 is not set,jump to LOOP_1
	SJMP	HEAVY	If P1.0 is set,jump to HEAVY
LOOP_1	JNB	P1.1,LOOP_2	Check prog setng knob for normal.if P1.1 is not set.jump to LOOP_2
	SJMP	NORMAL	If P1.1 is set, jump to NORM
LOOP_2	JNB	P1.2,LOOP_3	Chck prog setng knob for normal.if P1.2 is not set,jump to LOOP_3
	SJMP		If P1.2 is set,jump to LIGHT
LOOP_3	JNB	P1.3,LOOP_4	Check prog set knob for delicate. If P1.3is not set,jump to LOOP_4
	SJMP	DELICATE	If P1.2 is set,jump to delicate
DISPLAY	SETB	P2.7	Indicate the completion of wash cycle.
LOOP_4	NOP LJMP	0000	End of program