

SMART IRRIGATION SYSTEM – ENGINEERING SHEET

Bill of Materials (BOM)

Sr	Component	Model	Qty	Voltage	Peak Current
1	Microcontroller	ESP32-WROOM-32D	1	3.3V	240 mA
2	GSM/NB-IoT	SIM7000E	1	4.0V	700 mA
3	GPS Module	NEO-6M	1	3.3V	45 mA
4	Valve Driver	DRV8833	1	3.3–10.8V	1.5A
5	Latching Valve	12V Solenoid	1	12V	500 mA (pulse)
6	Buck-Boost	TPS63020	1	3.3V Out	3A
7	Battery	18650 Li-ion	1	3.7V	>2A
8	Boost Converter	3.7V→12V	1	12V Out	1A
9	4V LDO	High Current LDO	1	4V	1A

Power Distribution

Power Rail	Voltage	Connected Components
Rail 1	3.3V	ESP32, GPS, Driver Logic
Rail 2	4.0V	SIM7000E
Rail 3	12V	Latching Valve

Power Consumption Summary

Mode	Current	Approx Power
Sleep Mode	<150 µA	~0.6 mW
Idle Mode	60–100 mA	~0.4 W
GSM Transmission	700 mA	~2.8 W
Valve Actuation	500 mA (pulse)	~6 W (milliseconds)
Worst Case Peak	~1.5 A	~4–4.5 W