

WORKSHOP MECHATRONICS 22/23 : PEN PLOTTER

MORPHOLOGICAL CHART

This image is a detailed guide to various engineering components and their applications, organized into three main sections: **SOLUTION 1**, **SOLUTION 2**, and **SOLUTION 3**.

MODULES

- POWER SUPPLY**: DC POWERED (ADAPTER 12V) (C1)
- USER INTERFACE**: BLYNK BASED IoT APP INTERFACE (C3)
- DRIVE MODULES**: DC GEARED MOTOR (C1)
- FABRICATION PROCESS**: METAL FABRICATION (C3)
- MOTOR DRIVERS**: TB6560 (C3)
- MICROCONTROLLER**: RASPBERRY PI (C3)
- LIMIT SWITCHES**: OPTICAL ENDSTOPS (C3)
- ENCODER**: ROTARY ENCODERS (C3)
- PEN LIFTING**: SERVO MOTOR (C2)

SOLUTION 1

- DC POWERED (BATTERY 5V)** (C2)
- WEB BASED GRAPHICAL USER INTERFACE** (C1)
- STEPPER MOTOR** (C2)
- 3D PRINTING** (C1)
- SPARKFUN QWIIC MOTOR DRIVER** (C2)
- ESP32 BOARD** (C1)
- MAGNETIC PROXIMITY SENSOR** (C2)
- MAGNETIC ENCODERS** (C1)
- MANUAL METHOD** (C3)

SOLUTION 2

- SOLAR POWERED** (C3)
- SERIAL COMMAND BASED** (C2)
- SERVO MOTOR** (C3)
- INJECTION MOLDING** (C2)
- L298N** (C1)
- ARDUINO UNO** (C2)
- MICRO LIMIT SWITCHES** (C1)
- OPTICAL ENCODERS** (C2)
- DC SOLENOID** (C1)

SOLUTION 3

- Solar Panels** → **Solar Inverter** → **Home appliance**
- COM7** (Serial Port Monitor) showing hex dump of data (e.g., E0 dec: 114, hex: 72, oct: 162, bin: 1110010)

MODULES	CONCEPT - 1	CONCEPT - 2	CONCEPT - 3
POWER SUPPLY	DC POWERED (ADAPTER 12V)	DC POWERED (BATTERY 5V)	SOLAR POWERED
USER INTERFACE	WEB BASED GRAPHICAL USER INTERFACE	SERIAL COMMAND BASED	BLYNK BASED IoT APP INTERFACE
DRIVE MODULE	DC GEARED MOTOR	STEPPER MOTOR	SERVO MOTOR
FABRICATION PROCESS	3D PRINTING	INJECTION MOLDING	METAL FABRICATION
MOTOR DRIVERS	L298N	SPARKFUN QWIIC MOTOR DRIVER	TB6560
MICROCONTROLLERS	ESP32 BOARD	ARDUINO UNO	RASPBERRY PI
LIMIT SWITCHES	MICRO LIMIT SWITCHES	MAGNETIC PROXIMITY SENSOR	OPTICAL ENDSTOPS
ENCODER	MAGNETIC ENCODERS	OPTICAL ENCODERS	ROTARY ENCODERS
PEN LIFTING	DC SOLENOID	SERVO MOTOR	MANUAL METHOD

COMPARISON OF CONCEPTS - DECISION MATRIX