



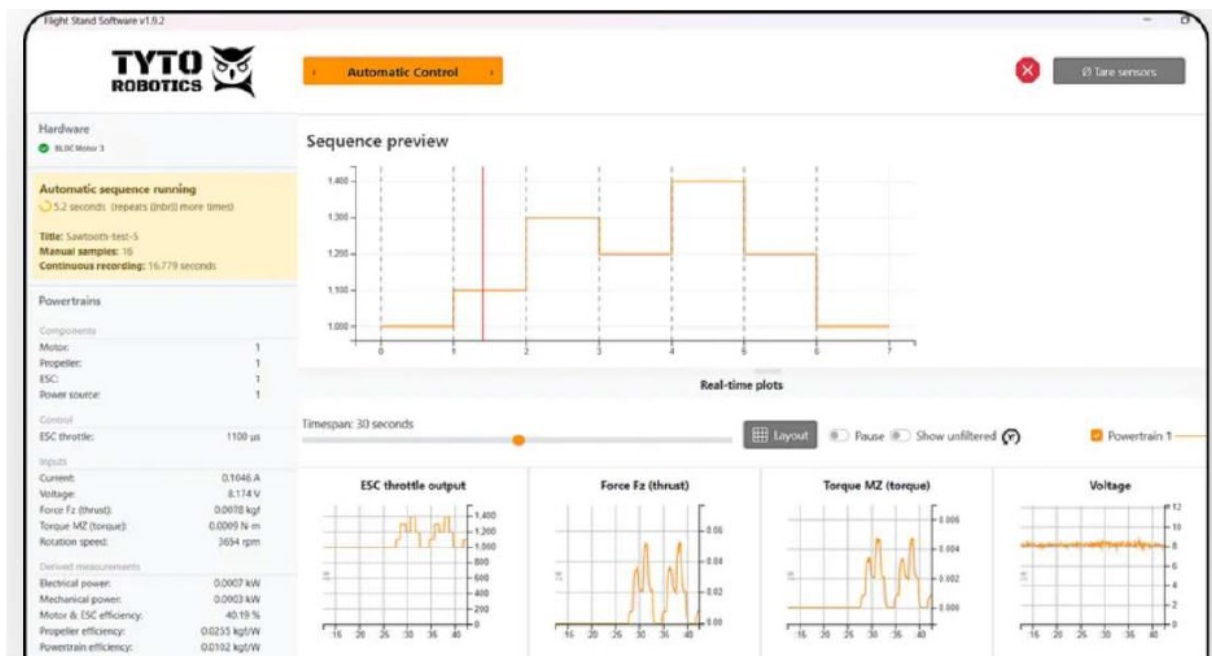
HACKATHON DELIVERABLES

A. GUI Design and Development

Problem Area: Shall be able to input the data fields, store the sensor data and publish the data in graphical method.

Specifications:

1. The interface shall be either ETHERNET or USB.
2. Typically, the communication protocols like Serial or CAN or I2C or UART shall be used.
3. The device shall measure the parameters like Current, RPM and few other parameters and write them in a digital format.



B. Drone Tamper Detection

Problem Area: Electronics & Communication Engineering

Problem Statement: To protect the drone hardware from tampering. A safety-critical need to shut off a portion of a product if opened, such as a smart lock or a high-voltage power supply.

Specifications:

1. The device shall be a lightweight electromechanical device.
2. The device shall support in any hardware component tamper situation. Typically, the communication protocols like Serial or CAN or I2C or UART shall be used.
3. The device shall send a SMS upon tamper.
4. The device shall be connected via 4G dongle / SIM / LTE module.

Resource 1:

Sensor Type	Cost	External elements	Type of tampering	Environmental needs	Detectability	Power consumption	Design complexity	Key products and size
Hall-effect sensors	Low	Magnet	Case open, system tampering	Access to two pieces of the case	Magnetic field	Switch: 0.54 μ A at 5Hz Linear: 2.3 mA	Medium	DRV5032 1.54 mm ² TMAG5273 4.6 4 mm ²
Inductive sensors	Medium	PCB coil and metallic object	Case open, impervious to magnetic fields	Access to place the PCB coil; needs metal to sense	Conductive targets (such as copper)	2 μ A to 4 μ A at 1 Hz	Highest	LDC0851 4 mm ²
Humidity sensors	High	None	Broken seal	None	Change in humidity	550 nA 400nA	Low	HDC2080 9mm ² HDC3020 6.25mm ²
Ambient light sensors	Medium	None	Broken seal, case open	Needs to have light levels change when case opens	Any light (broad spectrum to include infrared)	1.8 μ A	Low	OPT3002 4mm ²

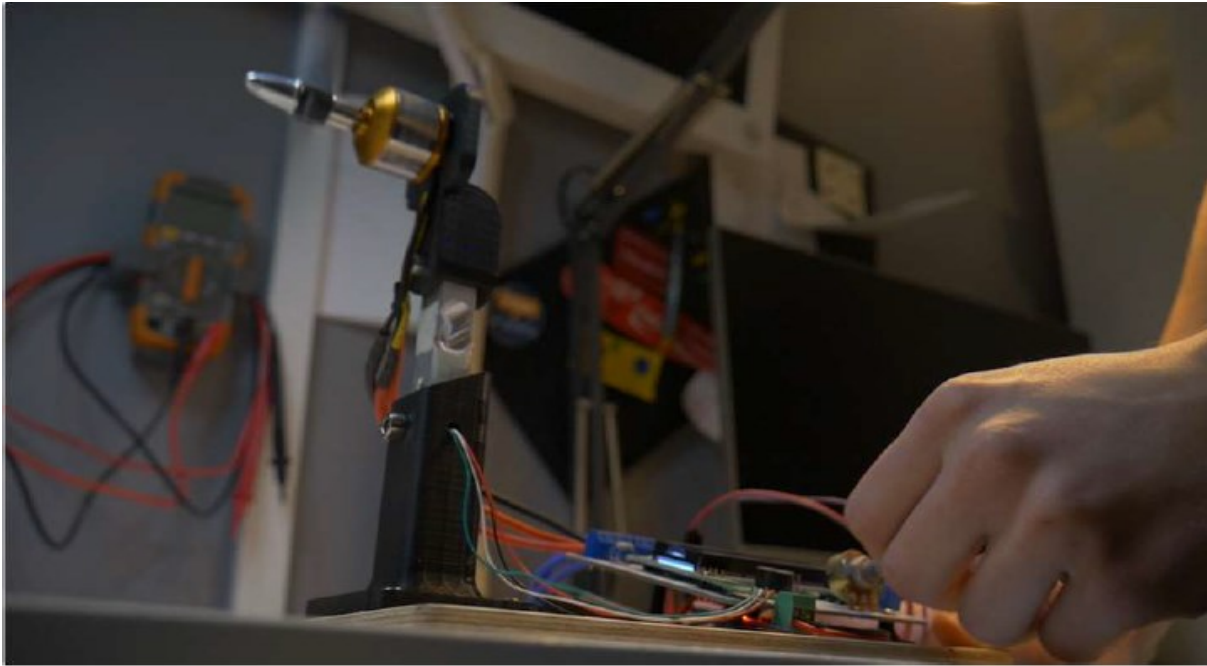
Resource 2: <https://hackaday.io/page/398993-tamper-protection-in-electronic-devices-a-critical-component-of-hardware-security>

C. Motor Thrust Stand

Problem Area: Aerospace & Electronics & Communication Engineering

Specifications:

1. The Project Includes a PCB Design.
2. The device shall support a 3D print stand with a Base.
3. Typically, the communication protocols like Serial or CAN or I2C or UART shall be used.
4. The device shall measure the parameters like Current, RPM and few other parameters.
5. The device Requires ESC, Motor, Arduino board and LCD screen hardware.
6. The students can build the PCB through KICAD PCB design software.



D. Folding Arm Adopter

Problem Area: Mechanical and Aerospace Engineering

Problem Statement: Folding ARM Adaptor for a Drone. The folding adaptor shall be one key auto return folding joint. The adaptor shall be accommodating two carbon fibre tubes to the folding joint adaptor. The adaptor can be horizontal fold or umbrella fold types.

Specifications:

1. The device shall support a 3D print stand with a base.
2. The folding adapter shall be one key auto return folding joint.
3. The adapter shall be accommodating two carbon fibre tubes to the folding joint adaptor.
4. The adaptor can be horizontal fold or umbrella fold types.

