

Meet Team AutoClox:



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Masimo is a global medical technology company based in Irvine, CA that develops and produces a wide array of industry-leading monitoring technologies, including innovative measurements, sensors, and patient monitors.

Project Overview

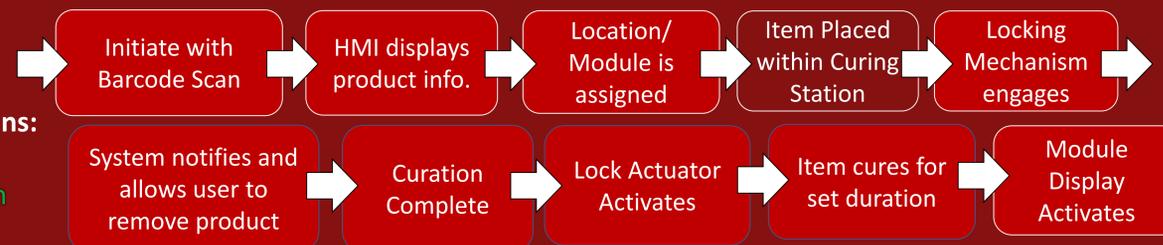
Problem: The company currently utilizes a curing process to manufacture some of its products. The current system is inefficient and confusing. Multiple products are being cured simultaneously, but they require different curing times. The main problem is human error and unreliable timing methods, resulting in products being removed prematurely. This error costs the company both time and resources.

Solution: Create an automated self-timing device and monitoring system. Able to notify the user which products are ready, and which products are still in the curing process. Prevents user error of removing items incorrectly.

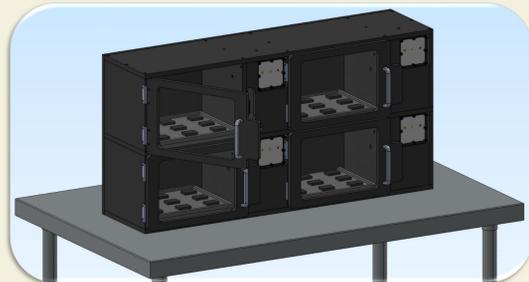
System Use Flow Chart:

Timer Module Indications:

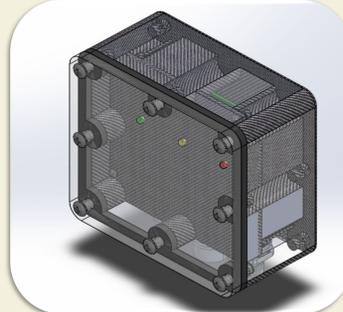
- Yellow – In Progress
- Green – Ready/Open
- Red - Error



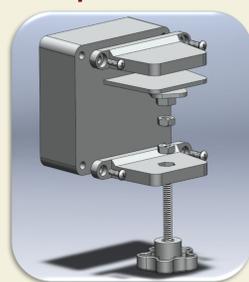
Smart Cure Cabinet



Timer Module



Clamp Attachment

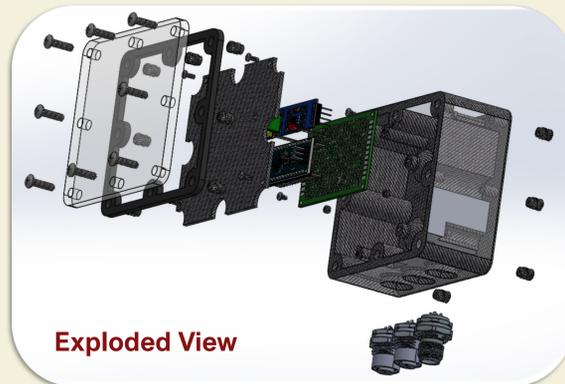
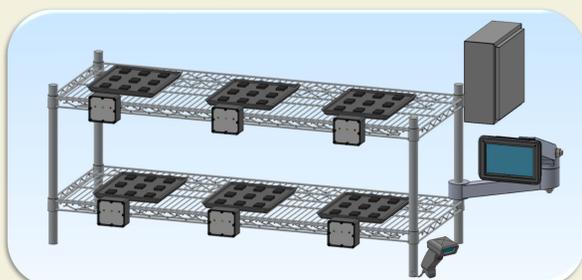


Cabinet Fabrication Process



The curing cabinet monitoring system features individual curing compartments, built-in timing modules, and electronic locking mechanisms that prevent the error of removing uncured products prematurely.

Modular Timer System



Exploded View

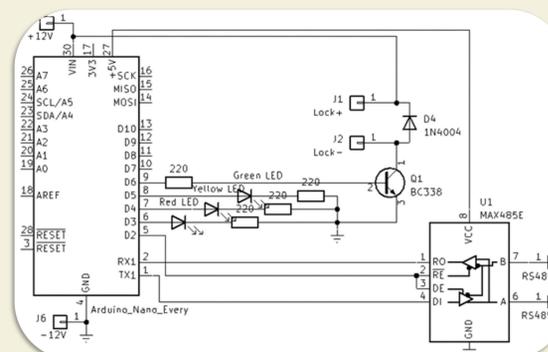
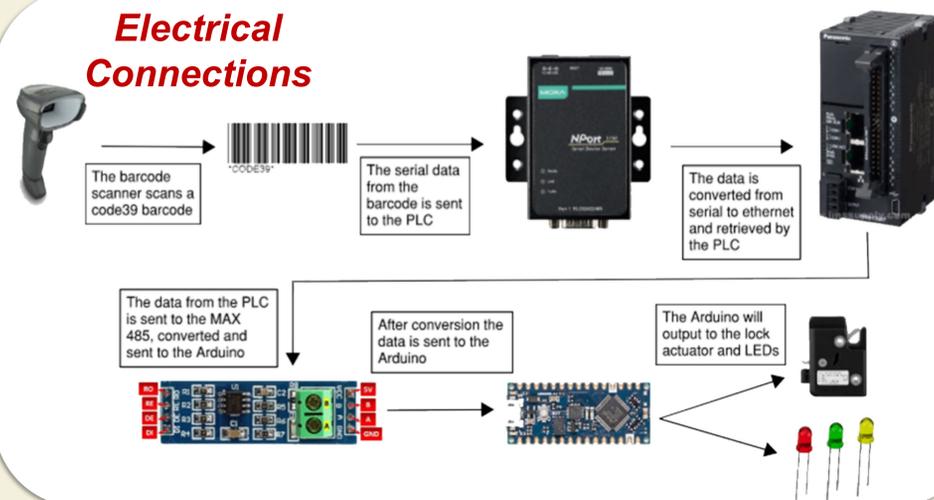
The timer module serves to protect the electronics from any outside harm. It features a certified IPX4 rating and has also proved durable surviving a tumble test where it was dropped from 1 meter high 100 times in a row.

Products that require curing can be scanned into the system using a barcode scanner and the monitoring system will begin. This system can be configured to suit a variety of curing stations such as wire racks, metal surfaces, or tables.

Acknowledgments

The team thanks Dr. Shaffar and Professor Dorr for their detailed guidance and arrangement of this project. The team would also like to thank the Masimo team for their support throughout this project, including Glenn Pohly, Jake Prittie, Jasmine Zhang, and Stanley Chang.

Electrical Connections



The hardware subsystems include the Panasonic FP0HC32EP PLC, 7" Weintek HMI, NPORT 5110 serial converter connected through ethernet. The additional subsystem includes the RS-485 connection with the Arduino Nano Every from the PLC through the Max485 RS-485 to TTL converter, the Arduino GPIO then outputs to the Actuator and LEDs.

ECE Prototyping Process

