Corry Rubber Corporation
ebferro@corryrubber.com
601 W Main St
Corry, Pa 16407

Jake's Custom Shop, LLC
Jake@JakesCustomShop.com
2803 Chelsie Drive
Erie, Pa

Project Description

Design and assemble the necessary components and software to acquire temperature data from six heating chambers of one industrial oven. The system will additionally provide an operator with timing and temperature monitoring of each oven. Future expandability to 12 ovens with centralized data collection to a PC.

Completion Date: Oct 28, 2023

SECTION I - Scope

1. Computer Software: Receives data from Master ESP-32 controller via USB and saves to a user defined directory file directory. A Graphical User Interface (GUI) will display live temperature readout from all oven chambers.
2. Remote IO Device: Collects temperature data once per minute per chamber, indicates cook time and completion. Can operate independently from the PC if necessary.
3. Customer supplies 120 VAC to each remote IO device, Industrial Oven, and Windows PC.
4. System setup, and calibration.

Remote IO Devices [1 per Oven]

Operator inputs:
- Timer Start button
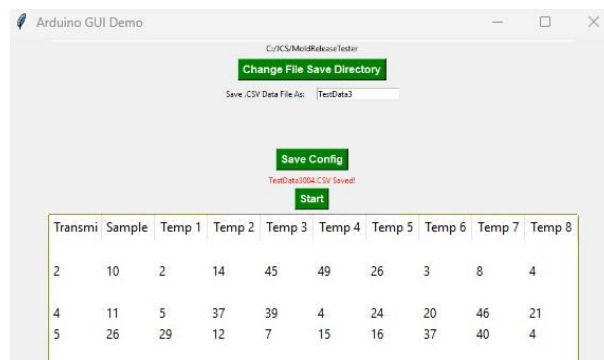- Cook Time definition
- Target Temperature range
- Oven number

Outputs
- Buzzer: Cycle start, cycle complete, Error
- Red Light: Cycle active
- Green Light: Cycle complete
- 20mmx70mm LCD display
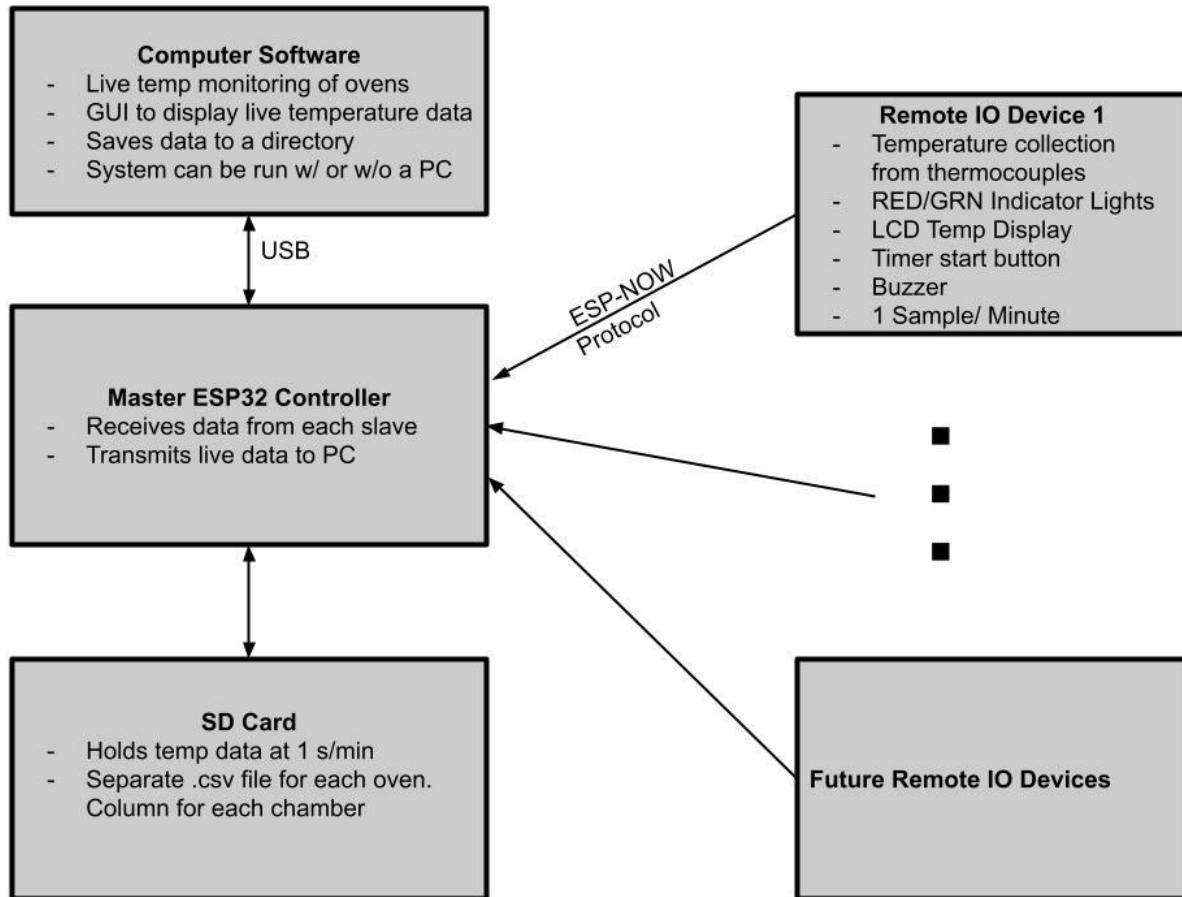   - Chamber temperatures
    - Cook time count-down

PC Interface

- Receives data from Master ESP32-PI via USB
- Saves temperature data to PC and adds a unique serial number to .csv file name
- User defined directory
- Indicates when temperature data is received successfully
- Receives live temperature data and displays on a (GUI)

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SECTION II - System Level 0 Diagram

Computer Software
- Live temp monitoring of ovens
- GUI to display live temperature data
- Saves data to a directory
- System can be run w/ or w/o a PC

USB

Remote IO Device 1
- Temperature collection from thermocouples
- RED/GRN Indicator Lights
- LCD Temp Display
- Timer start button
- Buzzer
- 1 Sample/ Minute

ESP-NOW Protocol

Master ESP32 Controller
- Receives data from each slave
- Transmits live data to PC

SD Card
- Holds temp data at 1 s/min
- Separate .csv file for each oven. Column for each chamber

Future Remote IO Devices

SECTION III - Bill of Materials

Item	QTY	Price	Total
J-Type Thermocouples	6	$29.93	$179.58
Thermocouple Wire, 10Yds	1	$29.95	$29.95
ABS Enclosure w/ Window	1	$30.00	$30.00
RPi DIN Rail adapter	1	$10.00	$10.00
ESP32-PI	2	$50.00	$100.00
Eight Thermocouples DAQ	1	$95.00	$95.00
LCD Hat	1	$25.00	$25.00
LCD Screen (4x20) LCD2004 (98x60mm)	1	$10.50	$10.50
AC/DC 5V Power Supply, MDR-20-5	1	$18.99	$18.99
Terminals and DIN rail	1	$29.88	$29.88
Micro SD card	1	$5.99	$5.99
RED/ GRN/ BUZZ Stack Light	1	$31.99	$31.99
Momentary Push button (qty2)	0.5	$18.74	$9.37
		TOTAL:	$576.25

QUOTE

From:

Jake's Custom Shop, LLC

2803 Chelsie Drive

Erie Pa, 16509

(814)-746-6596

For: **Corry Rubber Corporation**
601 W Main St
Corry, Pa 16407

INVOICE ID   20230928
Issue Date   9/28/2023
Terms

DESCRIPTION	AMOUNT	UNIT PRICE	PRICE
Materials and supplies for 1 Oven Monitoring and Timing System. See attached.	1.0	$576.25	$576.25
Electrical design, assebly and testing [Hrs Est.]	6.0	$30.00	$180.00
Software design and testing [Hrs Est.]	16.0	$30.00	$480.00
On-site setup/ installation [Hrs Est.]	4.0	$30.00	$120.00
			$1,356.25
		AMOUNT DUE	**$1,356.25**

Additional Notes:

Thank you for choosing our service, we hope to see you again soon!