



Background Information

Humidity is defined as the actual amount of water vapor in the air. Relative Humidity is the percentage of vapor compared to the max capacity of air in a given space. Screen Printing involves multiple solder pastes such as M731, M734 and M31. To ensure the best connection between the motherboard and nodes, relative humidity must be between 50-60%. Humidity below 40% causes defects in the print quality known as non-wetting. Humidity above 60% causes smudging of the terminals; this excess defect solder volume is known as de-wetting.

Problem Purpose

This project uses PLC software to monitor humidity levels in AUMOVIO's SPPs and alerts the engineers via a dashboard when values fall outside specified limits. This can help prevent unplanned shutdowns and nonconforming defects, which could cost the company up to \$300 per hour.

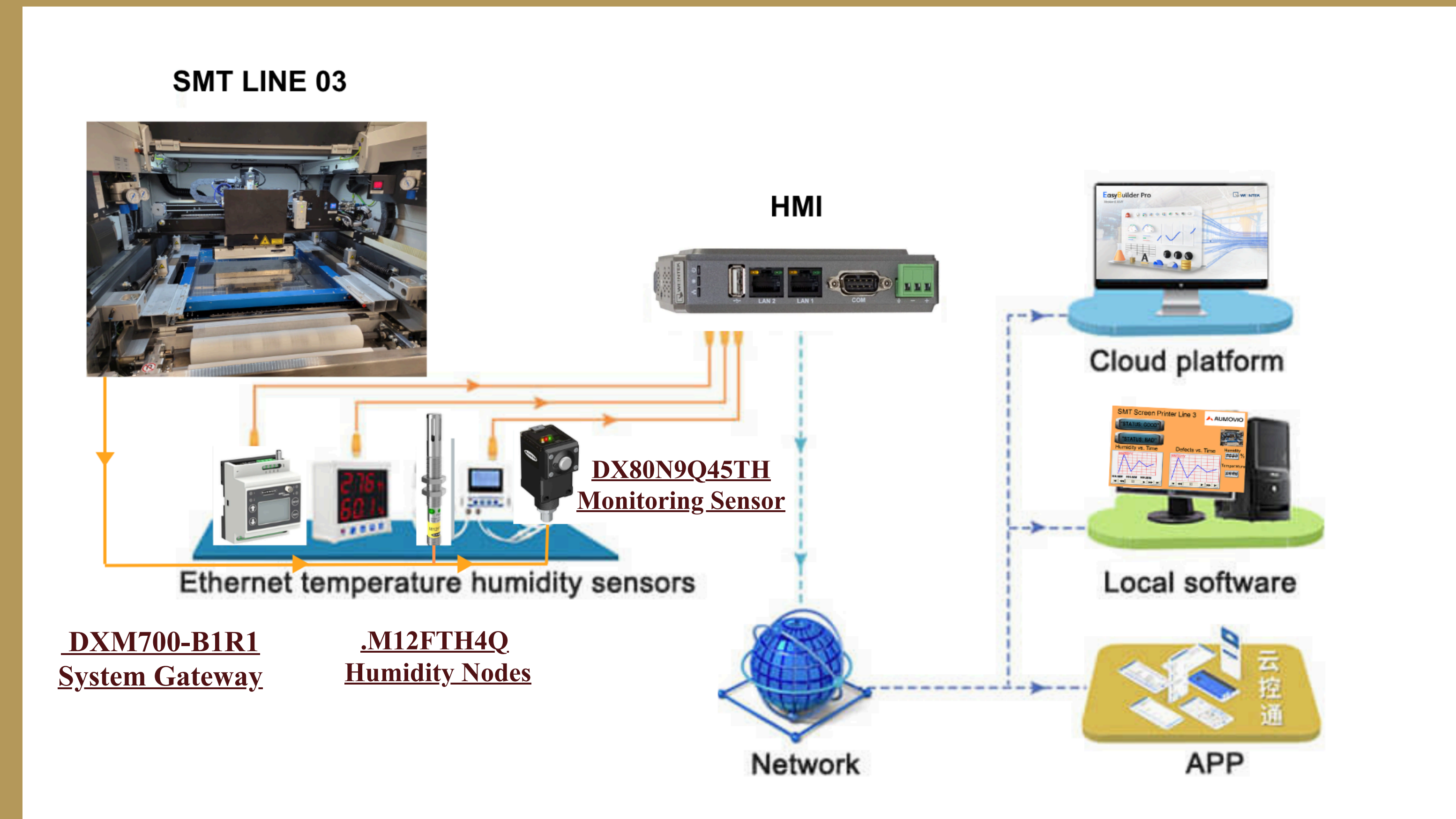
Problem Statement

Create a dashboard used to notify, monitor, and track the humidity levels to limit scrap money in solder paste and PCB boards. The team will design the mounting brackets for humidity sensors on the screen printers on SolidWorks. All SMT lines will have sensors installed and connected to the dashboard before May 8th, 2026.

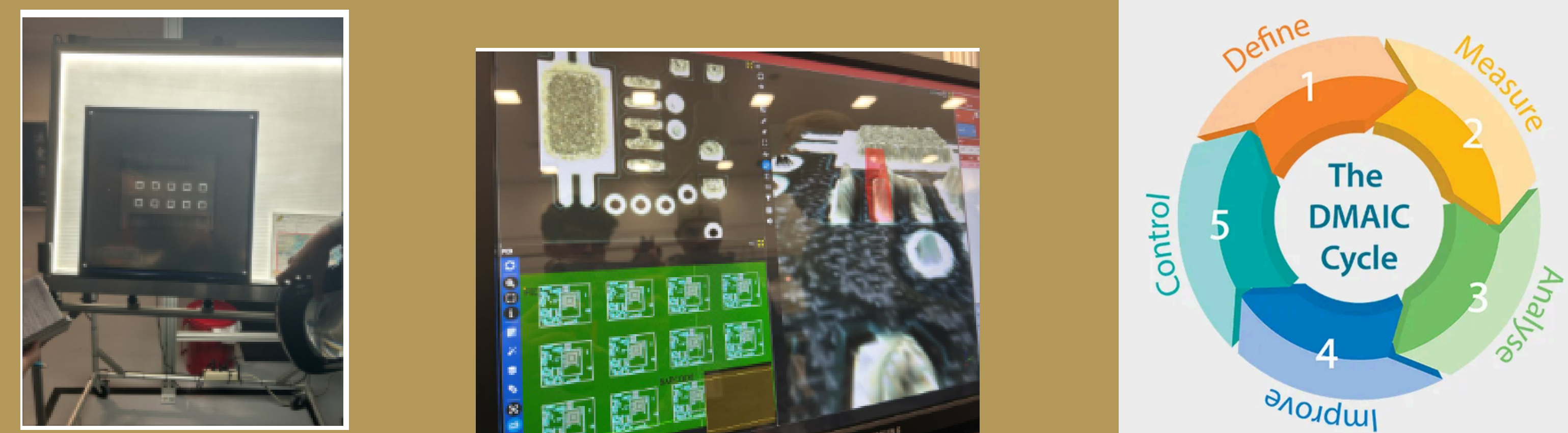
Human Factors, Ethics, and Environmental Concerns

Human Factors	Ethics	Environmental Concerns
Developed a clear and intuitive dashboard layout to ensure operators can quickly interpret humidity conditions with minimal training.	Ensures that displayed humidity data and alerts reflect true system conditions to prevent misleading operators or engineers.	Supports optimized environmental control systems (e.g., HVAC, humidifiers) by identifying when adjustments are necessary.
Utilized color-coded indicators (green/red) to provide immediate recognition of normal and abnormal conditions, reducing response time.	Implements reliable alert systems to ensure critical environmental issues are communicated promptly to prevent equipment damage or product defects.	Promotes consistent environmental conditions that improve product quality and reduce the need for rework or disposal.
Centralized monitoring of all SMT lines into a single interface to minimize operator effort and improve situational awareness.	Designed with fail-safe considerations to reduce the risk of missed alarms or system misuse that could impact production quality.	Maintaining proper humidity levels helps prevent defective circuit board production, reducing material waste.

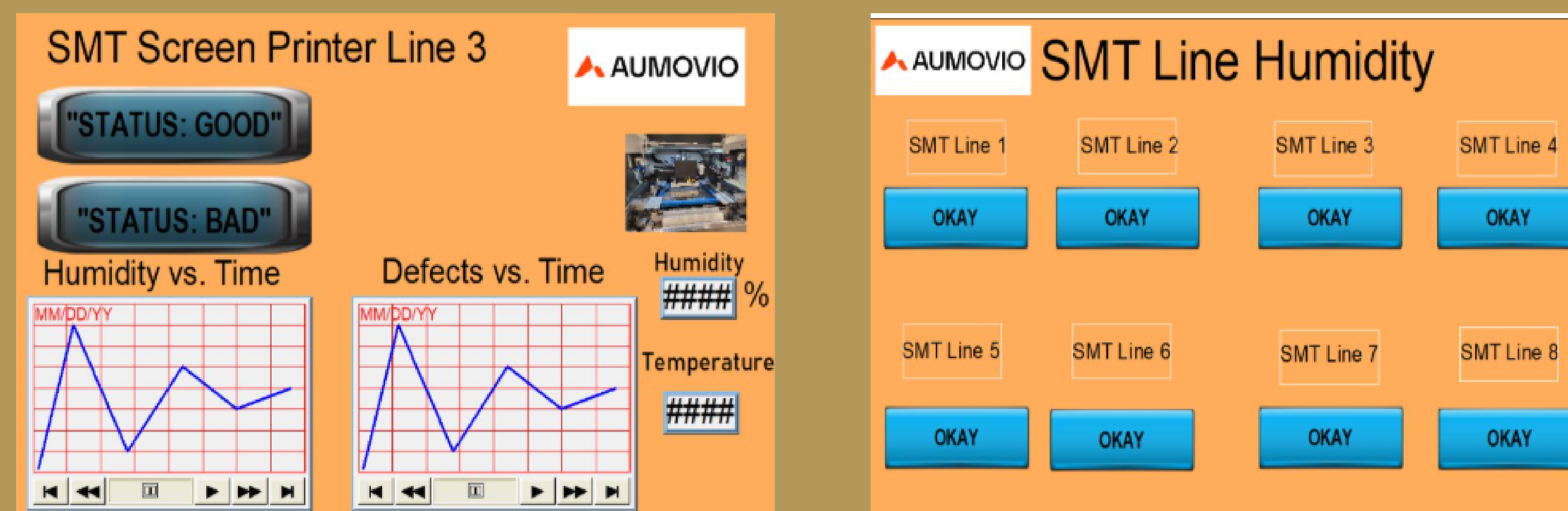
Project Methodology



The flow of information begins with the sensor collecting real-time humidity values. This information is then transmitted to the System Gateway to the HMI and then the Dashboard. Once all the Screen Printers are connected, daily trends and alerts can be displayed, thus emphasizing Total Productive Maintenance.



Dashboard Final Design



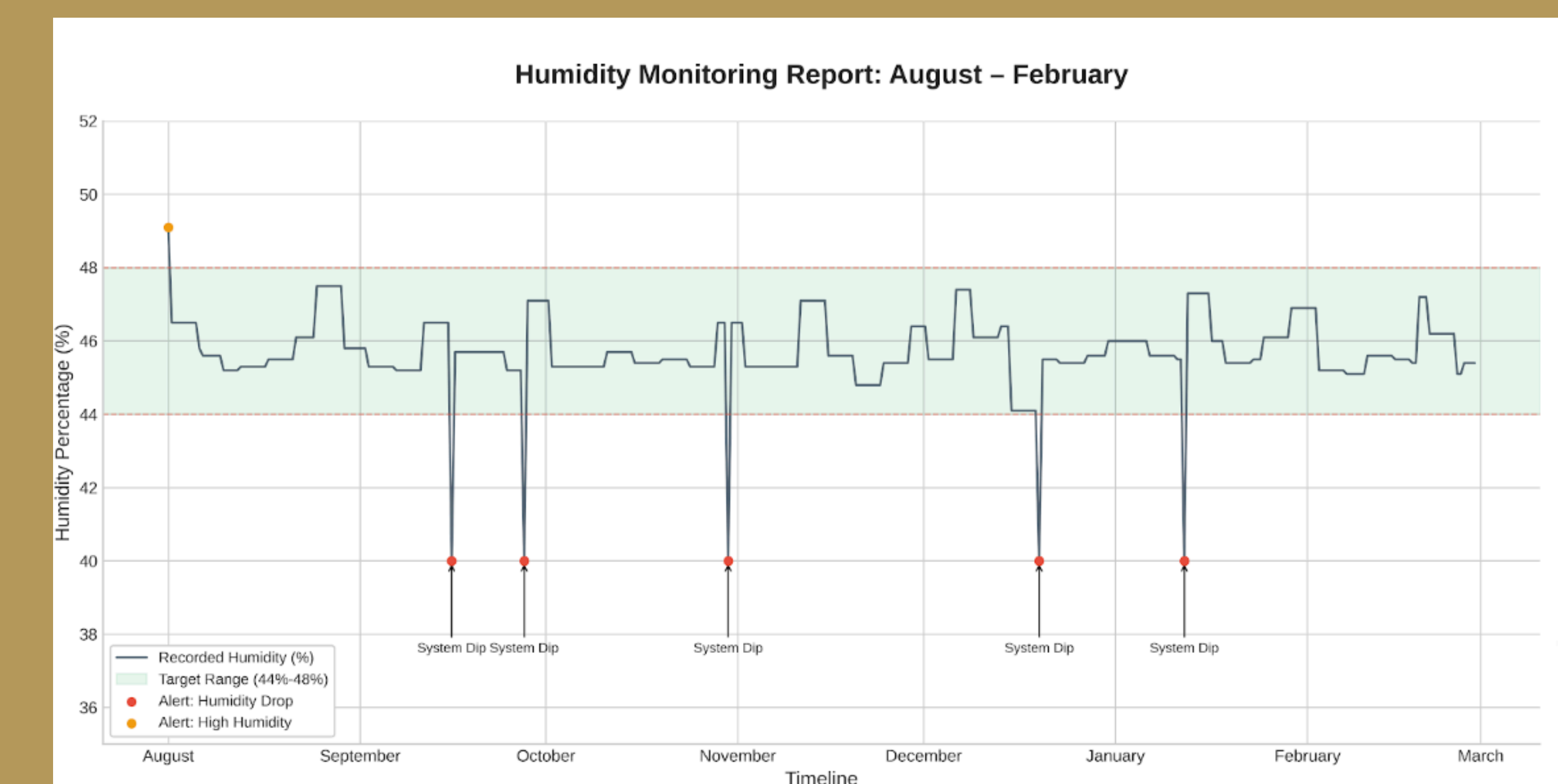
Key Features:

- Dynamic trend analysis using time series graphing of humidity data percentages
- Visual alarm feedback using color coded indicators
- Interactive line level navigation for detailed humidity inspection

Future Plans/Scope

- Connect ERB Pro to local HMI AUMOVIO facility
- Use visual sensors to alert engineers and floor workers of any issues with the printers
- Integrate dashboard to all eight SMT lines for monitoring and tracking

Humidity Over Time Chart with Out of Range Values Highlighted



Team Members



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