Line Traceability & Assembly Line Monitoring



SPECIFICATIONS / FEATURES
QR-based traceability across all variants and assembly stages.
Automated verification and torque logging.
Real-time PLC–LabVIEW data monitoring.
Intelligent production planning with BOM-based part tracking.
Live dashboards, validation, and automated reporting through SCADA.

CHALLENGE

The system enables simultaneous monitoring of multiple scanners, weighing stations, test boxes and nut-runners across the production line. It efficiently detects faults such as incorrect parts or scans and facilitates smooth switching between different models once the target production quantities are achieved.

SOLUTION

TMCS implemented a LabVIEW-based DAQ & SCADA system leveraging OPC-UA protocol for tag monitoring, event generation, and production validation.

TEST TYPE	DESCRIPTION / PARAMETERS MONITORED
Part Matching & Validation	Real-time verification of part compatibility at each station.
Torque & Assembly Verification	Confirms proper torque application and assembly accuracy.
Alarm & Error Detection	Generates alerts for incorrect or missing components.
Production Sequence Validation	Validates process order and logs production reports.

TECHNOLOGY USED

- LabVIEW SCADA: Real-time monitoring and control.
- OPC-UA: PLC–LabVIEW data communication.
- PLC System: Controls scanners, nut-runners and test boxes.
- QR Traceability: Identifies parts and variants.
- Torque Monitoring: Records torque for each assembly.
- BOM Validation: Verifies correct part matching.
- Data Logging: Enables full process traceability.

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