CASE STUDY

OleumTech® and Techmark Deliver Highly Robust Monitoring Solution for Improving Commercial Ink Production

THE CHALLENGE

The production department of a leading commercial ink manufacturer wanted to monitor and log vital production process conditions such as tank level, pressure, temperature, and ink mill/pump RPM data. Before introducing OleumTech's automation solution, the commercial ink manufacturer captured these conditions on many points throughout the facility at non-regular sampling intervals that ranged from fifteen minutes to a few days. This process, not being automated, relied solely on operators and there was no way to guarantee the accuracy and integrity of the data sets. Moreover, they had no traceable data to evaluate what the process conditions were like when attempting to analyze sub-standard ink batches.

Inkmaker, a global distributor of ink mills and production equipment, sought help from OleumTech and Techmark International, a complete automation solutions service provider, to automate these types of ink manufacturing facilities to improve productivity and efficiency. The goal was ultimately to make a higher yielding, more consistent quality product for their customers such as commercial ink manufacturers.

Techmark and Inkmaker received the opportunity to build an automation system for the leading ink manufacturer's facilities for the pilot. This indoor site consisted of the following assets to be monitored around-the-clock:

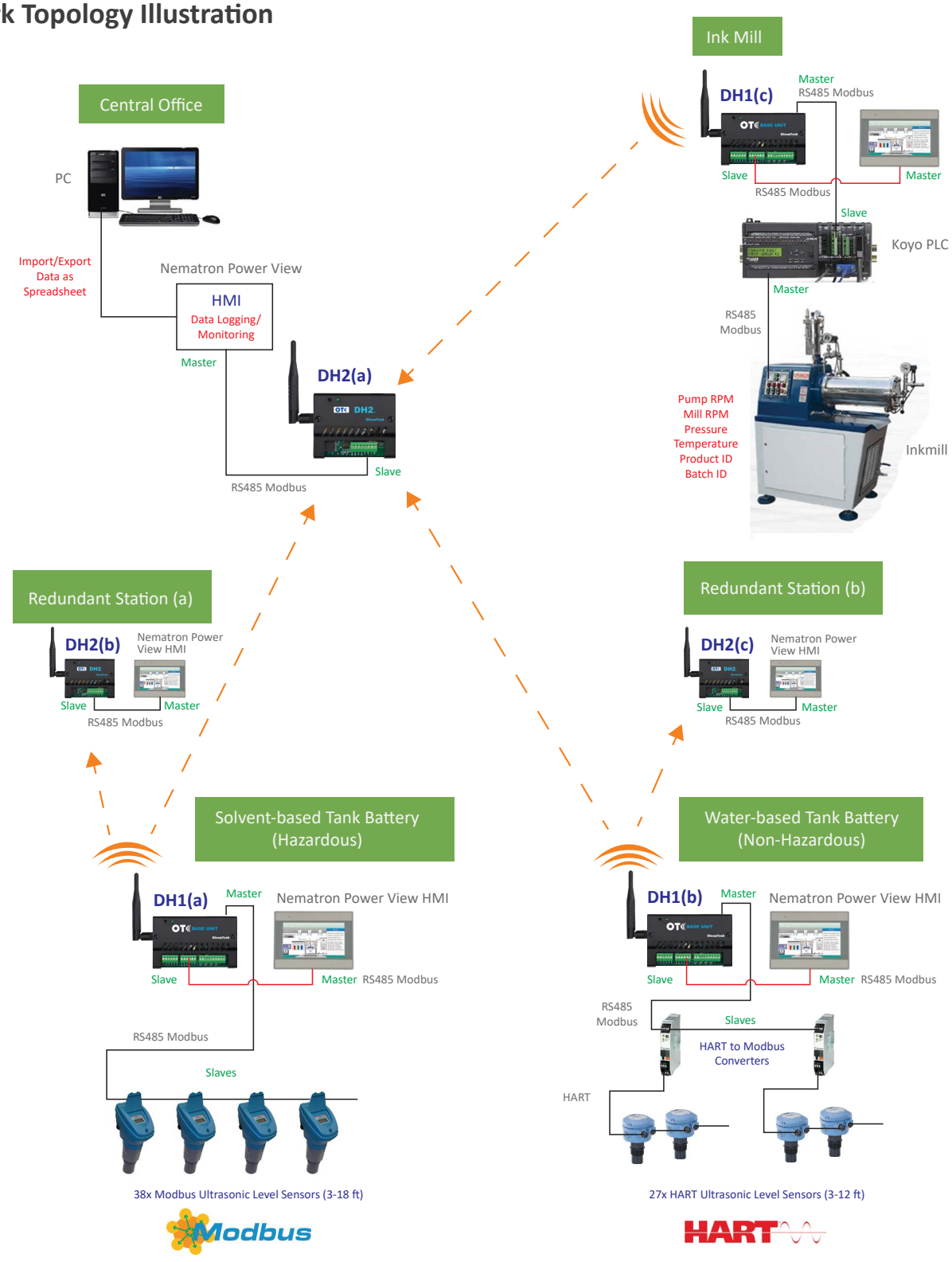
- 38 tanks containing solvent-based liquids in a hazardous location (3-18 ft tanks)
- 27 tanks containing water-based liquids in a non-hazardous location (3-12 ft tanks)
- Ink mills

Image: Industrial Ink Production Machine | www.inkmaker.com

THE SOLUTION

The team at Techmark designed and bench tested a highly robust system for quick turnkey deployment that was economically viable. Techmark engineered a hybrid system, integrating hardwired sensors (Modbus/HART) for collecting the raw process data and using OleumTech's wireless network for data aggregation and concentration from multiple remote hubs to the central data location where the data can be monitored and recorded using Nematron PV series HMI's. The final system design, topping all competitive technologies considered, delivered high quality results at the best value.

Network Topology Illustration



Solvent-based tank battery (hazardous):

1. 38 tanks were multi-dropped with Modbus (slave) Ultrasonic sensors
2. Modbus sensors were connected to the OleumTech DH1(a) Wireless Gateway setup as a Modbus Master through one of its RS485 port – the aggregate data is wireless transmitted to the DH2(a) located at the central office and to another DH2(b) for redundancy and remote viewing purposes
3. A Nematron Power View HMI was connected to the other DH1's RTU Serial port as Modbus Slave for local data accessibility
4. Redundancy: DH2(b) and HMI to view exact data as seen in Solvent-based tank battery from another location within the factory

Water-based tank battery (non-hazardous):

1. 27 tanks were outfitted with HART Ultrasonic sensors
2. Two HART to Modbus converters were utilized to bridge HART sensors to OleumTech's DH1(b)
3. The aggregate data collected by OleumTech's DH1(b) Wireless Gateway, setup as a Modbus Master through one of its RS485 ports, is wirelessly sent to the DH2(a) located at the central office and then to another DH2(c) for redundancy
4. Nematron Power View HMI was connected to DH1's(b) other Serial port as Modbus Master for local data accessibility
5. Redundancy: DH2(b) and HMI to view exact data as seen in Solvent-based tank battery from another location within the factory

Ink Mill:

1. Koyo PLC connected to ink mill, collecting pump RPM, mill RPM, product ID, batch ID, pressure, and temperature data
2. DH1(c) acquires data from the PLC and transmits it to DH2(a) located at the central office
3. DH1(c) is equipped with discrete outputs that can be utilized for immediately shutting down the ink mill to protect it from damage in the future (replacing the seals on the mill alone could cost up to $15k from high pressure or temperature damage)

Central Office:

1. DH2(a) wirelessly receiving data from other OleumTech Gateways (DH2 is equipped with a 1920-point Modbus table, providing plenty of data head room)
2. Nematron Power View HMI setup as a Modbus Master to DH2 collecting and logging data.
3. PC connected to HMI to import/export data as spreadsheet

SUCCESS

The ink manufacturer's pilot site consisted of 67 tanks and 1 ink mill. The pilot leveraged both wireless and hardwired solutions. Techmark and Inkmaker helped reduce the budget by another $20k USD. A per cost point of less than $4,000 USD was achieved that included all engineering, testing, and installation costs. It is important to note that some wireless level transmitters alone could cost almost as much as the total cost of this solution.

"After spending two painstaking years researching and developing a complete turnkey level monitoring and automation system for ink mill operation, we are quite proud of the achievement. We chose to design a hybrid system to reduce as much cost, but without sacrificing any performance by selecting the right sensors and robust and flexible wireless technology by OleumTech. The OleumTech Wireless Gateways were chosen for their high scalability and control application that the end user can take advantage of in the future for setting up emergency shutdown, valve control, and alarm," said, Marcio Rivas, VP of Techmark International.

"With the solution that Techmark put together, we believe our customers can universally benefit from the cost savings and turnkey deployment. To have accurate and plentiful data for quality control and business potential is priceless," said, Vicente Mendoza, Engineering Manager, Inkmaker.

After the deployment, the sensor data is now being collected every 15 seconds. Techmark, utilizing OleumTech's robust, reliable wireless solutions that can integrate with virtually any third-party hardwired sensors and SCADA equipment, the ink manufacturer can now oversee their entire ink production operation autonomously. If subpar ink batches are ever discovered, the producer can easily retrieve the process data associated with that particular batch of ink for evaluation and make further improvements for future production. "Our wireless sensor network was designed precisely for these types of industrial automation applications. Techmark has done a great job offering its customers with this robust, cost-effective solution," said, Vrej Isa, COO of OleumTech.

LEARN MORE

For more information or for help solving automation challenges, please contact an OleumTech representative today by phone at 1.949.305.9009 or by emailing sales@oleumtech.com

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