

Three Station Leak Test Stand

Challenge

John Henry Foster Company was asked to provide an automated test fixture to accurately measure the leak rate of brass water valves. The existing test fixtures utilized mechanical clamps and a dunk tank. Operators would clamp the valves, immerse them in water, and watch for bubbles. The test results were inconsistent and the mechanical clamping was very dangerous to operators.

Goals

- Automated test fixture
- Repeatable, high-resolution (0.00001 psi) tests
- Safe operation

System Features

- Cincinnati Test Systems leak test controller
- Allen Bradley Controls for Sequence
- Allen Bradley Panelview Interface
- Fully automatic operation
- Go/No-Go test results
- Safety circuits with guarding
- Startup assistance by JHF engineering

Project Success

- Turn-Key Solution: design, build, programming, and startup provided by John Henry Foster
- Completed on time and within budget
- No guesswork of test results = increased quality



Two Station Leak Test Stand

Challenge

John Henry Foster Company was asked to provide an automated test fixture to accurately measure the leak rate of brass water valves. The existing test fixtures utilized mechanical clamps and a dunk tank. Operators would clamp the valves, immerse them in water, and watch for bubbles. The test results were inconsistent and the mechanical clamping was very dangerous to operators.

Goals

- Automated test fixture
- Results to 1/1,000,000 of a PSI
- Safe operation

System Features

- Cincinnati Test Systems leak test controller
- Allen Bradley Controls for Sequence
- Automation direct touch screen interface
- Fully automatic operation
- Go/No-Go test results
- Safety circuits with safety light curtains
- Startup assistance by JHF engineering

Project Successes

- Turn-Key Solution: design, build, programming, and startup provided by John Henry Foster
- Completed on time and within budget
- No guesswork of test results = increased quality



Model Excavator

Challenge

John Henry Foster Company was asked to provide a reliable control system that mimicked the operation of an earth excavator. The system was to be included in a science center's Structures exhibit and would control a small model version of an excavator.

Goals

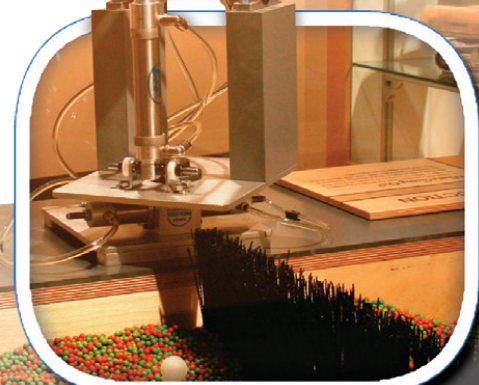
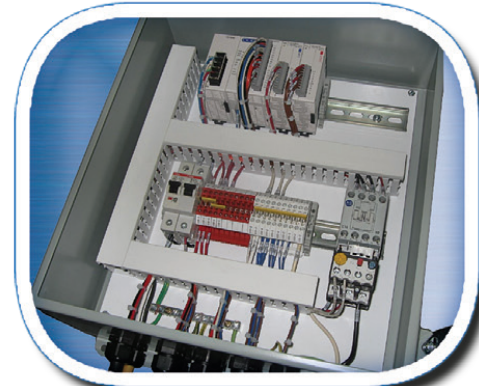
- Realistic operation
- Ease of use – would be used by every age range
- Reliable, continuous operation
- Budget constrained project – initial plans were to use manual controls which proved to not be as realistic as desired

System Features

- PLC for excavator control
- Joystick control for excavator functions
- Timeout feature for auto-shutdown

Project Successes

- Provided within budget and given schedule
- Popular exhibit, with a line formed at all times creating a continuous operation demand
- Safe, easy operation for use by all ages



Pigment Batching Systems

Challenge

John Henry Foster was asked to provide a fully functional, turn-key control system for a mechanical color dispensing machine. The customer supplied the frame, but JHF handled the rest - including hydraulics, pneumatics, electrical controls, and programming.

Goals

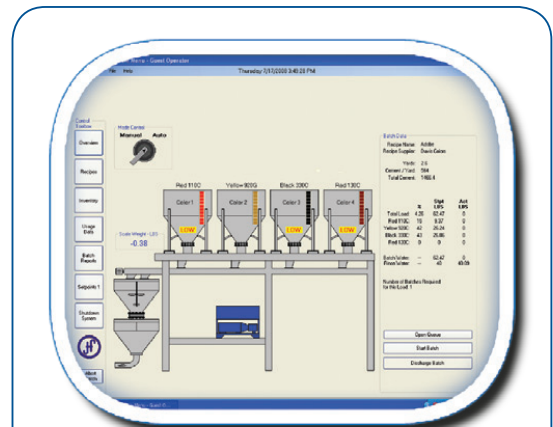
- Turn-Key machine
- Accurately batch up to 5 granulated pigments, in any combination, to produce the desired end color
- Batch within specifications, down to 0.01 lb accuracies
- Ease of setup and operation
- Stored batch data

System Features

- Turn-Key machine fully assembled, tested, shipped from JHF
- Variable Speed Hydraulic batching components
- Allen Bradley PLC
- JHF custom software on Windows® based PC for machine operation, graphical representations, and data collection
- SQL database for recipes and batch data
- Automatic Batch Report generation
- "On-Demand" configurable report generation
- On-Site setup and tuning by JHF Engineering staff
- Continued support through remote connectivity

Project Successes

- More than 100 Systems installed across the U.S. and Canada
- Intuitive System - graphical interface for simple operation
- Hundreds of thousands of color batches produced over the last 10+ years



Large Scale Conveyor Control

Challenge

John Henry Foster Company was contacted to design an electronic control system to control a large conveyor system. The system is used for just-in-time production assembly, supplying parts to the operators for placement on vehicles.

Goals

- Design system to meet automotive specification
- Provide parts as needed to meet just-in-time delivery requirements
- Easy system installation

System Features

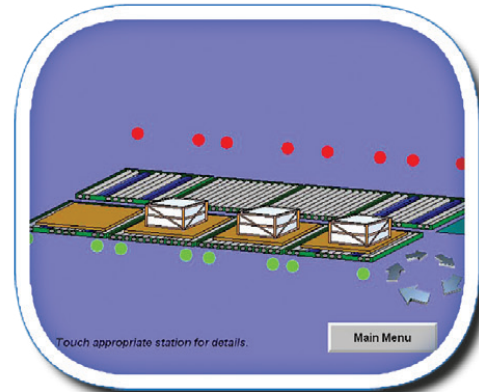
- Allen Bradley SLC PLC
- Allen Bradley Panelview Plus Operator Interface
- NEMA style motor controls and protection
- Separate rated lighting and control transformers
- Ungrounded control system
- Safety rated floor mats for operator access

Project Successes

- Completed within budget and within schedule
- On-site installation assistance provided by JHF

"This was the first system we have ever installed that worked the first time on power!"

-Maintenance Technician



Grain Vacuum Probe

Challenge

John Henry Foster Company was contacted to design and deliver a turnkey solution to control a grain extraction probe that takes samples of grain from trucks for moisture testing. The probe had to be capable of extracting grain from the bottom of the truck bed to get an accurate moisture count.

Goals

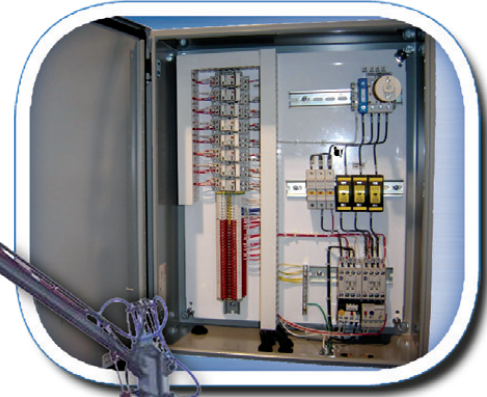
- Install hydraulic system with six direction probe movement
- Hardwired system – no programmable controls
- Joystick control
- Easy installation for residential electrical contractors
- Turnkey system, assembled and tested at JHF

System Features

- 3-5 HP hydraulic power unit
- 3 axis of movement (in/out, up/down, left/right)
- Optional warning horn, lighting, and vacuum controls
- Multiple supply voltages available
- Remote joystick box
- C-UL listing available

Project Successes

- Over 110 systems built
- World-Wide installations
- Meet tight delivery schedules during springtime and harvest
- Tested, assembled, ready for final installation when shipped from JHF



Concrete Batching Plant – Controls Upgrade

Challenge

John Henry Foster Company was contacted to replace an outdated control system that operates a self consolidating concrete (SCC) batching plant. The mechanical hardware was functional, but the outdated PLC system needed replaced.

Goals

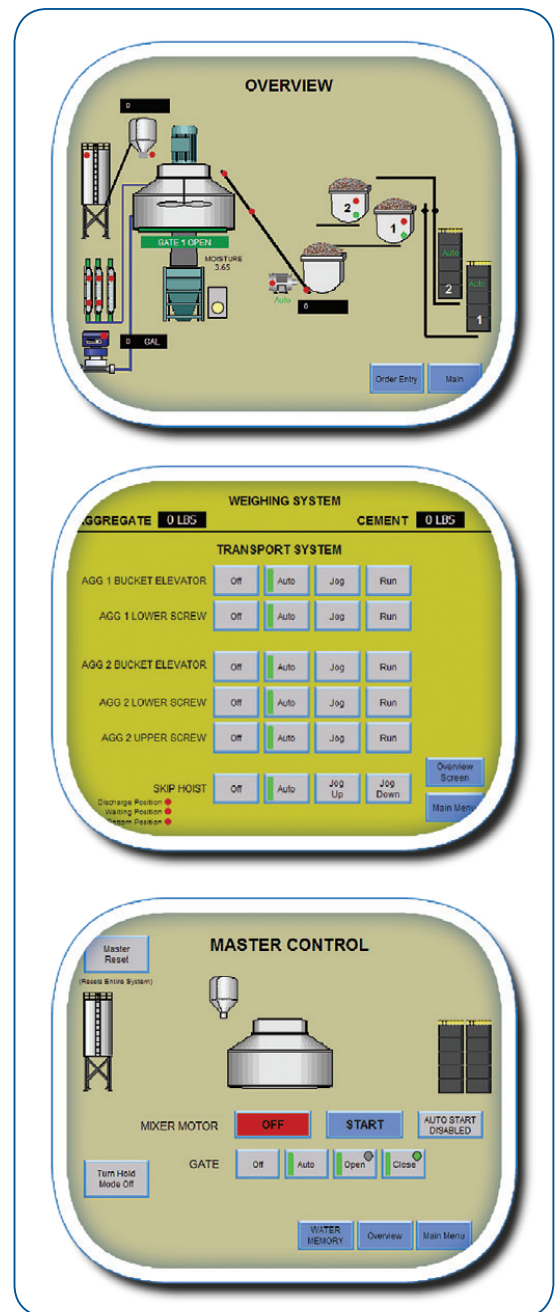
- Replace existing PLC and PC with modern components
- Integrate new PLC with all existing field hardware, ensuring compatibility with the rest of the plant
- Shutdown time not to exceed 5 days
- Minimal scrap production upon startup
- Successful and consistent production of SCC with Automatic Moisture compensation

System Features

- Allen Bradley SLC ethernet based PLC
- Rockwell Software FactoryTalkSE Operator Interface
- Automation Direct CMORE Touchscreen interface for plant-floor control
- Database storage of all batch recipes and batch data
- Automatic batch reports, acceptable to PCI standards
- "On-Demand," configurable report generation

Project Successes

- Completed ahead of schedule and within budget - requiring only 4 days of downtime
- All field hardware compatible with new PLC control
- No scrap batches produced - all materials used in tuning were recycled, and the first combined batch was usable
- Batch Moisture Compensation ensuring consistency



Vacuum Pump Test Stand

Challenge

John Henry Foster Company was asked for a rotary vane vacuum pump, tested and verified to meet medical industry standards set by end-customer and the medical association. To satisfy the testing criteria, a test stand was built at JHF. Thousands of pumps have been successfully tested on the stand, with the results relayed to the end customer and electronically archived.

Goals

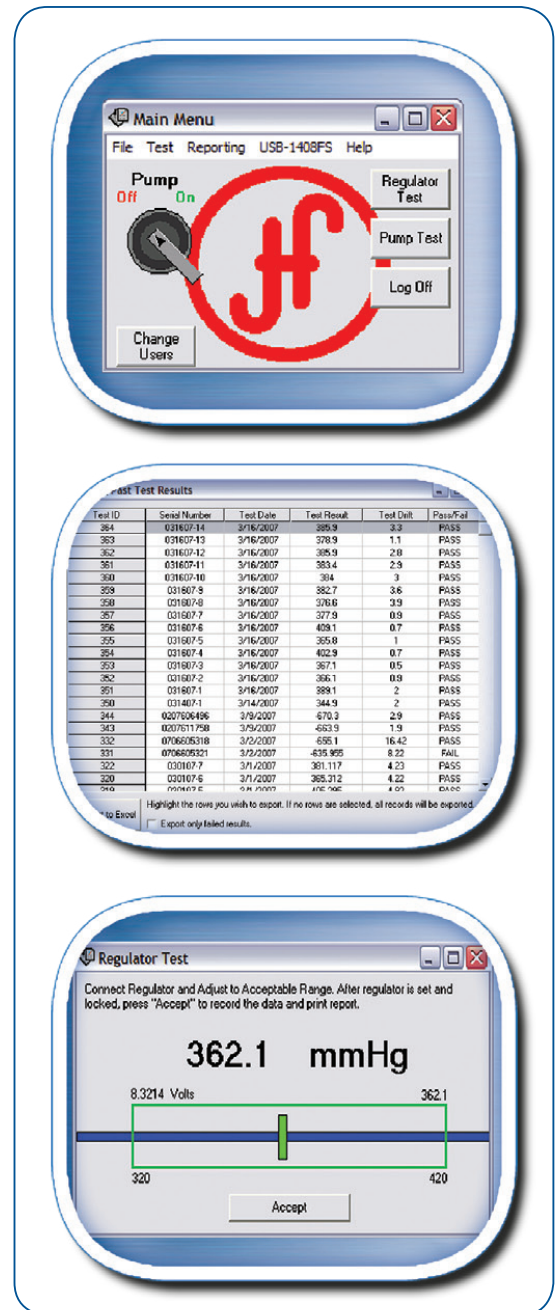
- Run pump through series of steps to verify performance
- Store all results of the test
- Provide Certificate of Conformance for performed test

System Features

- PC controlled I/O system
- Customized software for control and data acquisition
- Database storage of testing parameters & pump results
- On-Demand customized certificate of conformance with appropriate data
- One-touch operation for test

Project Successes

- Has become the standard used by end-customer for vendor supplied testing
- Easy operation
- Upgradeable for future testing changes
- Customized reporting
- Archived testing results
- Printed Certificate of Conformance with data for all vacuum pumps included in shipment



Servo Controlled Box Centering Conveyor

Challenge

John Henry Foster Company was asked to provide a control system to automatically center various sized boxes on a conveyor and then position inkjet print heads within a specified distance from the box edge. After positioning, the print heads were to be triggered as the box passed. All positioning to be done without stopping the box, which had never been accomplished previously.

Goals

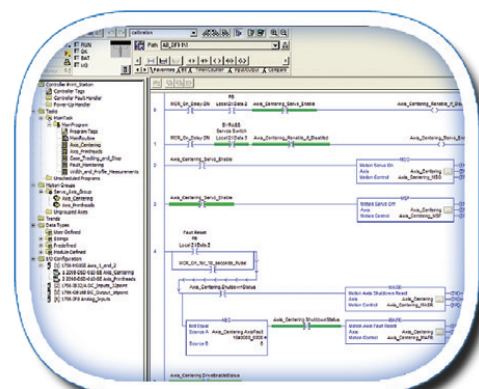
- Design an innovative system to perform all measurements and positioning without stopping the box or the conveyor.
- Present boxes square to the print heads.
- Precisely position print heads along edge of boxes.

System Features

- Allen Bradley ControlLogix PLC for Sequence Control
- Allen Bradley Servo Drives
- SERCOS Communications
- Panelview Operator Interface
- SICK Precision Laser Distance Sensors
- JHF Startup Assistance in England

Project Successes

- Accurately positioned boxes on conveyor and sustained optimum print quality on each box
- Measurement and positioning completed without stopping conveyor or box
- No need to stock boxes for individual products. Unprinted boxes are printed on packaging line, decreasing inventory costs associated with packaging.



Unwinder Monitoring System

Challenge

John Henry Foster Company was asked to provide a control system to monitor the roll diameter of a paper unwinding machine. If the paper roll completely unwinds, the entire plant shuts down for lack of material. To minimize this risk, operators currently operate the machine manually during the last 10-15 minutes of every roll, ensuring it does not run out unexpectedly.

Goals

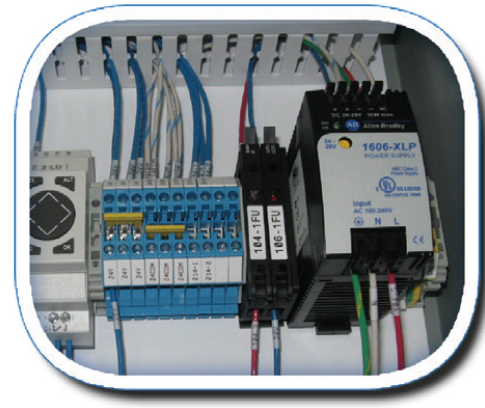
- Automatically monitor roll diameter
- Alert operator when it is time for a roll change
- Shut down line if roll gets too low

System Features

- Smart relay (Micro PLC) control system
- Minimal installation requirements
- Automatic/manual operation of unwinder
- Precise photoelectric sensor for roll diameter detection
- Visual and Audible warning systems

Project Successes

- Accurate to only a few wraps of paper left on roll
- Less than one minute of operator time now required for roll change
- Accurate warning system if roll gets too empty, eliminating the risk of running out of paper and shutting down plant



Single Station Ammunition Servo Press

Challenge

John Henry Foster Company was contacted to design a hydraulic and electronic system for precise control of a single bay ammunition press. The existing system relied on manually operated hydraulic control valves, requiring extensive operator involvement and producing high scrap percentages as well as high downtime rates.

Goals

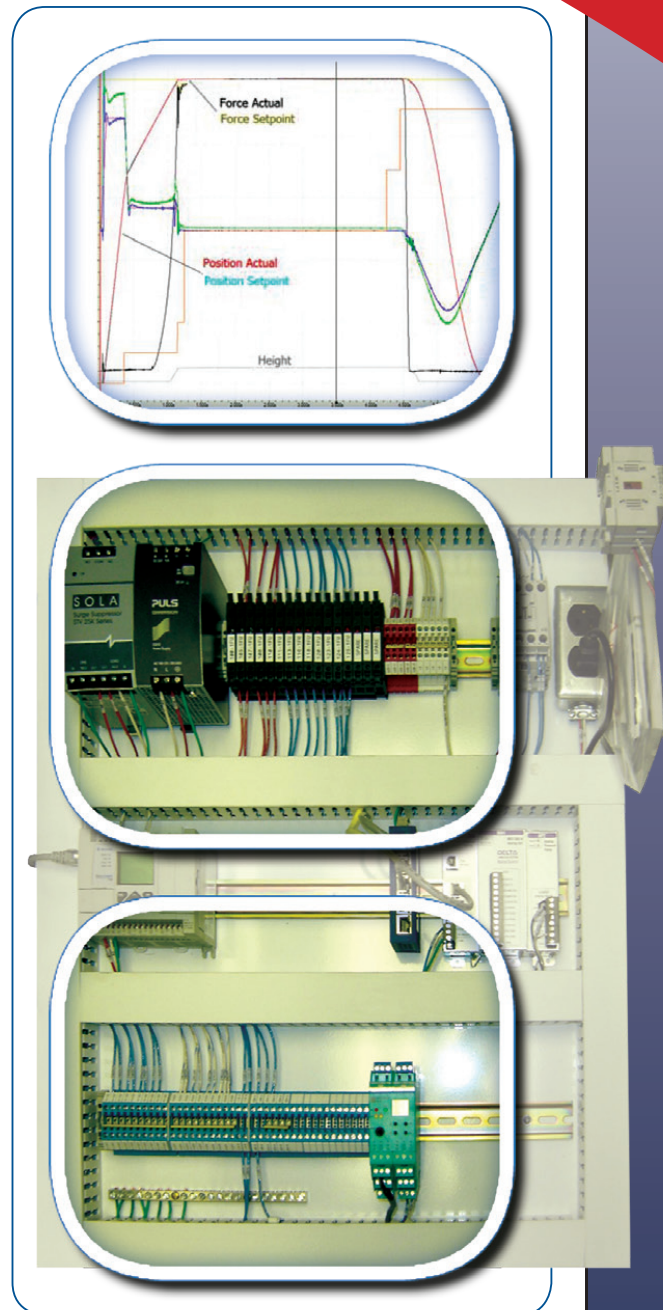
- Electronic Control of Force and Position within specifications
- Reduction of Downtime
- Reduction of Scrap
- Electronic storage of all Press Data

System Features

- Allen Bradley Micrologix PLC platform
- RSView32 Interface on Industrial Touchscreen PC
- Delta RMC70 Motion Controller
- Microsoft Access Database for Press Data Storage and Sequence Recipe Storage

Project Successes

- Scrap rates down from 5% to less than 1%
- Increased Production
- Increased Quality
- Completed within budget and within schedule requirements



Ammunition Press Line – Multiple Stations

Challenge

John Henry Foster Company was contacted to design a hydraulic & electronic system for precise control of a 12 station ammunition press. The existing system relied on manually operated hydraulic control valves, requiring extensive operator involvement and producing high scrap percentages as well as high downtime rates.

Goals

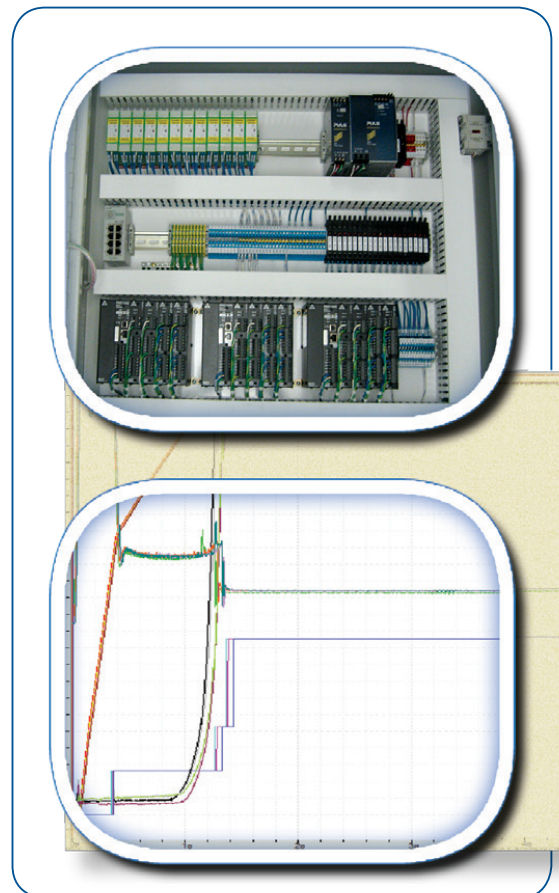
- Simultaneous electronic control of force and position for 12 cylinders (24 axes) within given specification
- Reduction of Downtime
- Reduction of Scrap
- Electronic storage of all Press Data
- Incorporate all servo controls into existing Allen Bradley PLC-5 control system.

System Features

- Delta RMC150 Motion Controllers
- Custom programming to reside in existing PLC and interface with the rest of the machine controls
- Customized cylinder tuning to reduce effect of induced shock to hydraulic system
- Ethernet communications to existing hardware

Project Successes

- Scrap Rates from 7% to less than 1%
- Production Rates Quadrupled
- Increased Uptime
- Meets all given force and position specifications
- Completed within budget



Corrugated Pipe Drilling Controls

Challenge

John Henry Foster Company was asked to provide a control system to automatically drill holes into plastic drainage pipes. The holes patterns and placement needed to be configurable based on operator input. Accuracy was critical on hole placement to ensure that the pipe drained properly in the end installation.

Goals

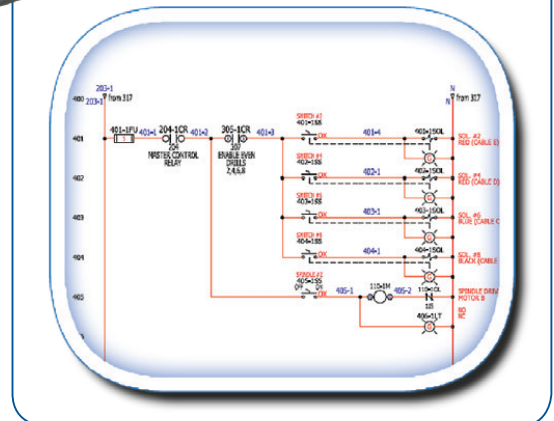
- Accurate Drilling Control for precise hole location
- Operator definable drill-hole positions
- Hole placement accuracy down to .01"
- Locate, Measure, and Drill all holes on moving pipe as it exits the extruder
- 50% Speed Increase over existing machines

System Features

- JHF Integration of Controls to Customer supplied machine — turn-key final solution
- Six Selectable, Programmable Hole Patterns
- Allen Bradley PLC for Sequence Control
- Automation Direct Touchscreen Interface
- Complete Documentation

Project Successes

- Project met customer supplied budget and schedule requirements
- Machine met demands of accuracy and speed
- Controls functioned so well that existing machines were retro-fitted and equipped with the new controls design!



Mobile Railroad Tie Clipper Controls

Challenge

John Henry Foster Company was asked to design, build, and startup an electronic control system for clipping and declipping railroad tie hardware. The system would be on a custom built rail car and had to withstand the elements while providing uninterrupted, maintenance-free service in remote locations. Previous plans utilized industrial controls hardware not rated for these conditions. *JHF was the first to propose a mobile rated system, capable of holding up to extreme conditions.*

Goals

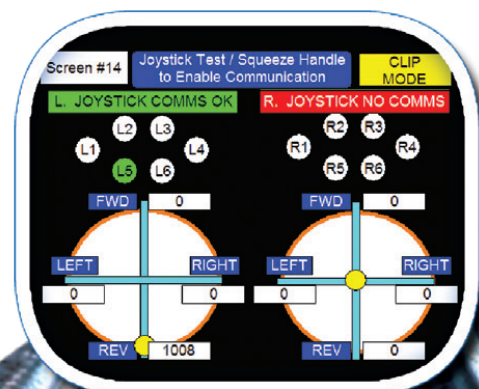
- Control system rated to withstand harsh environment conditions, including temperature, humidity, and vibration
- Expandable for future additions
- Easy operation – Operators to need minimal training
- Consistent, reliable, and maintenance free operation

System Features

- IFM Efactor Mobile rated PLC
- IFM Efactor Mobile rated operator interface
- 12VDC control system
- Integrated CANBus communications
- Joystick Control
- Railroad approvals
- Startup assistance by JHF Engineering

Project Successes

- Railroad approved hardware
- Consistent operation
- Completed within customer specification
- All screwless wiring connections for vibration resistance
- Mobile rated PLC and Interface Screen



Concrete Batch Plant – Complete Automation

Challenge

John Henry Foster Company was asked to design, build, and startup an electronic control system for an entire batching plant. The ingredients consisted of 4 aggregates, 2 cements, 5 chemical admixtures and water; all being batched to a single mixer.

Goals

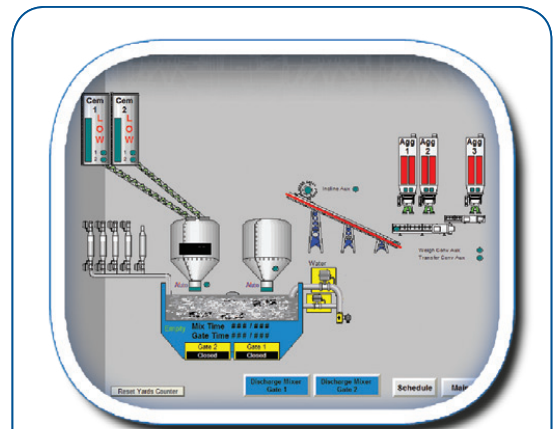
- Simple installation
- Easy operation – operators not trained on PC controls
- Consistent batch quality
- Reliable, maintenance free hardware
- Expandability
- 4 minute batches

System Features

- Allen Bradley PLC
- Rockwell Automation FactoryTalk ViewSE Interface
- Ethernet communications
- Rice Lakes Weight Indicators
- IEC motor controls, with soft starters on large motors
- Microsoft Access database for recipe storage and batch data storage
- Customized, "On Demand" report generation
- Auto adjustment for moisture compensation
- Remote connectivity for troubleshooting and maintenance assistance by JHF Engineering staff
- Pre-weigh materials to minimize batch mix time

Project Successes

- Easy operation – minimal training with on screen graphical representations of plant hardware
- Consistent batch quality
- State certified concrete batching process



Dynamometer Controls and Data Acquisition

Challenge

John Henry Foster Company was asked to design a hydraulic and electronic system for testing transmission systems. With the end customer, JHF determined the testing needs; including test sequence, required inputs/outputs, required data, and overall operation. Their current system required plant operators to record data and adjust teststands manually. The tests were either stopped when operators were not present or the data was lost.

Goals

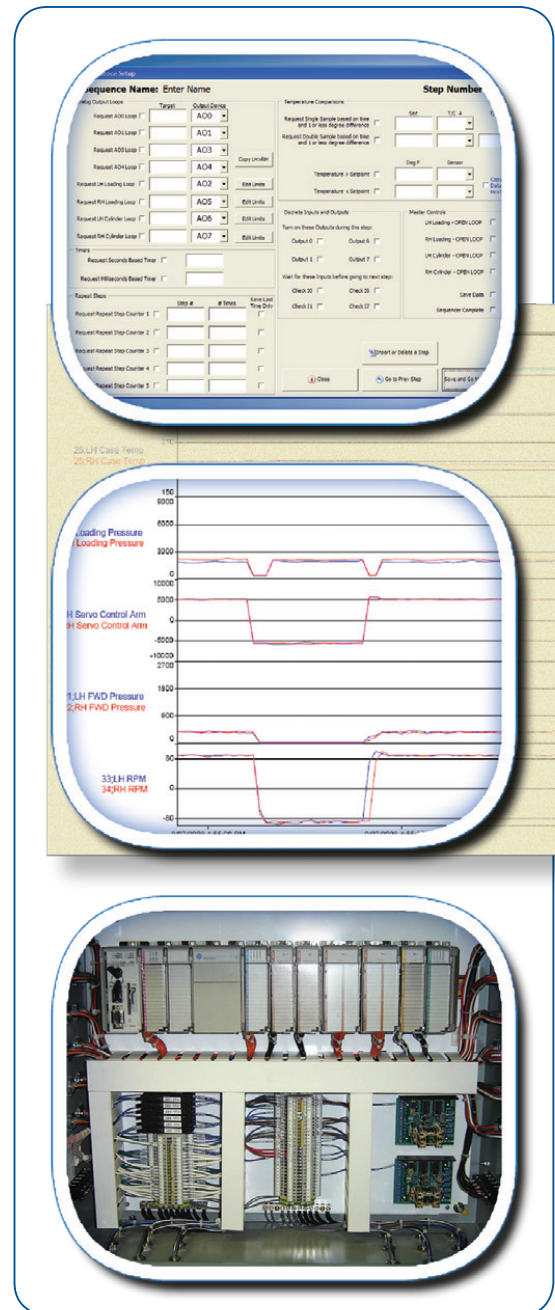
- Configurable sequence of operation
- User definable data points, with ability to save the information
- Automated data acquisition, control, and shutdown
- Expandable for future I/O Data Connection/Acquisition

System Features

- Allen Bradley Compact Logix control system
- RSViewSE Distributed Operator Interface
- 50 Step definable sequence, including speeds in any direction, aiding or opposing loading, and sequence controlled analog and digital outputs
- Operator Configurable IO, Including discrete, analog, thermocouple, and high speed
- Sequence data saved to SQL database
- Sequence Recipe and IO Definitions stored to SQL Database
- On Board "Flight Recorder" for real time logging of all data on specified time intervals
- Real Time, on screen trending of defined IO
- Real Time Email of faults
- Servo controlled actuators for precise speed control
- Hydraulic Proportional valves for precise system loading

Project Successes

- Increased data collection with more accurate results
- Un manned operation, allowing night and weekend testing and data collection



Custom Hydraulic Cylinder Test Stand

Challenge

John Henry Foster Company was asked to provide a fixture for the testing of high pressure avionic cylinders. The cylinders control airline functions such as ailerons, rudders, elevators, and landing gear — so precise and accurate testing is critical in their manufacture and repair. The teststand needed to incorporate manual controls for hydraulic flow and pressure, as well as include readouts for actual values.

Goals

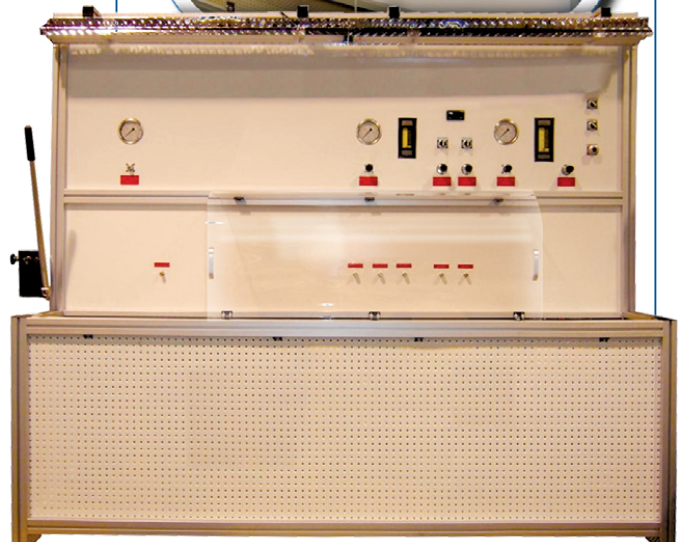
- Capable of testing cylinders of various stroke, bore, pressure, and flow
- Adjustable pressure and flow controls
- Readouts for pressure and flow

System Features

- Custom integrated control enclosure
- Front panel operation for ease of operation
- Movable lexan guarding
- Manual override pump for high pressure applications
- Extruded Aluminum frame with hardened steel testing surface

Project Success

- Complete Turn-Key Solution: design, build and test by John Henry Foster
- Accurate and reliable testing of cylinders
- Containment system eliminating oil leaks during cylinder changes.



Hydraulic Pressure Switch Test Stand

Challenge

John Henry Foster Company was asked to provide a fully functional, turn-key fixture for cycle & burst testing of Pressure Switches. The system would cycle test switches up to 5000 PSI with programmable time delays and pressure spikes. A burst test to 10,000 PSI was also required. Further needs include; system to be contained within a minimal footprint, provide accurate and reliable results, be safe and easy to operate, and run on power available in India.

Goals

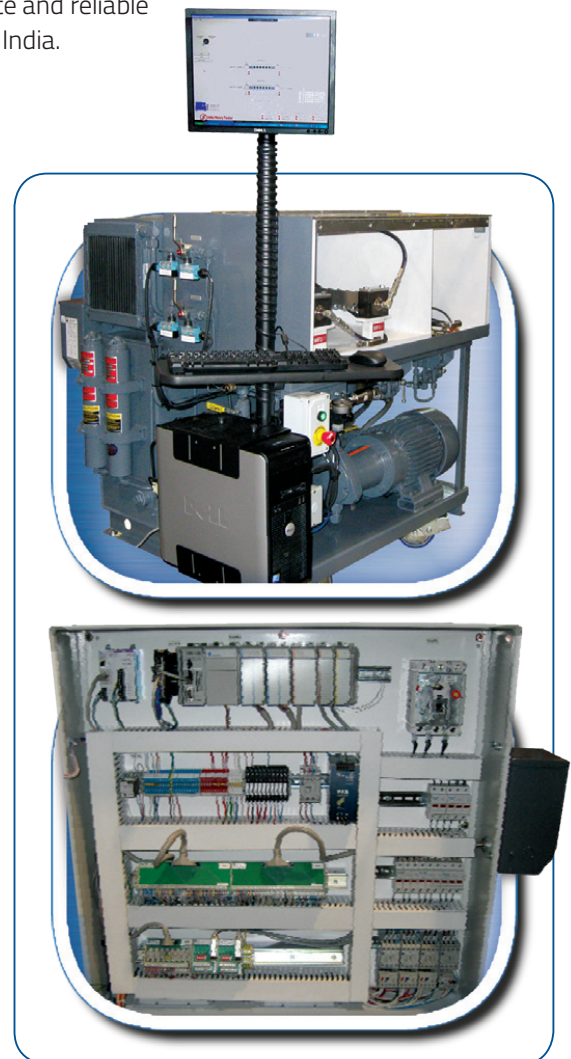
- Turn-Key Machine
- Safe Operation
- +/- 10 PSI Accuracy on tests < 1000 PSI
- +/- 50 PSI Accuracy on tests > 1000 PSI
- Simultaneous Testing of up to 18 Pressure Switches
- Definable Testing Sequence
 - Operating Pressure, Time Delays, Cycle Profile, and Pressure Spike

System Features

- Turn-Key machine assembled, tested, and shipped from JHF
- Allen Bradley PLC, Delta Motion Controller
- Bosch-Rexroth and Sun Hydraulic Proportional Valves
- JHF Custom Software on Windows® based PC for Machine Operation, Graphical Representations, and Data Collection
- Microsoft Database for Sequence and Test Result Storage
- On-Demand data export
- 4 ft X 3 ft footprint
- Enclosed Testing Area with Safety Interlocks
- Dual Bosch Rexroth Hydraulic Power Units
- 415 VAC Components

Project Success

- +/- 10 PSI Accuracy to 5000 PSI
- Definable Burst and Cycle Tests
- Shipment to India within Time and Budget Constraints



Wireless Trailer Steering Controls

Challenge

John Henry Foster Company was asked to provide a wireless controls solution to remotely steer extended length trailers. The trailers are built with a steerable axis, and wireless control is needed so that the trailer can be maneuvered through narrow parking lots or around obstacles.

Goals

- Provide a wireless solution for left and right steering controls
- Wireless controls should have an extended range
- Wireless controls should be on a secure frequency so that interference is not an issue
- Rugged build for mobile environment
- Manual Override

System Features

- REMTRON brand reliable wireless transmitter and receiver
- 1500+ foot wireless range
- Removable wired pendant for manual override
- JHF Integration of Controls to mobile rated hydraulic steering unit
- Rugged handheld transmitter with leather protective wrap

Project Success

- Accurate and reliable steering of trailer rear tires
- No issues with reliability, interference, or range

