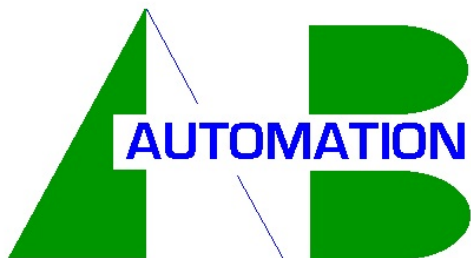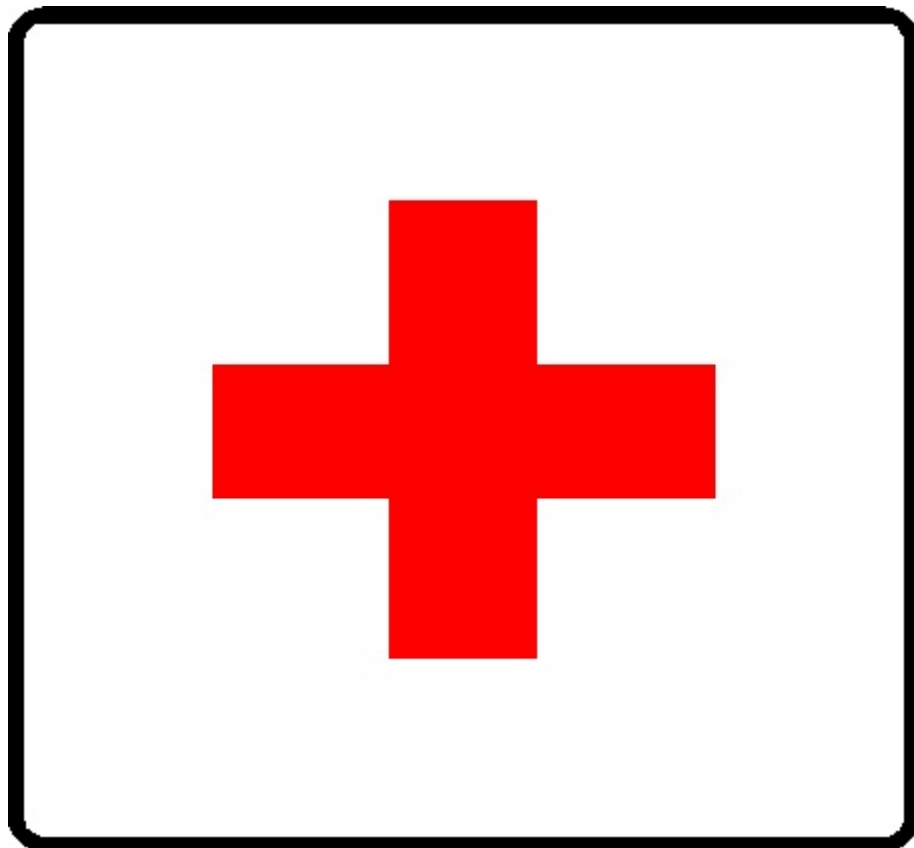# Project Profiles

Pharmaceutical & Medical Products

Able-Baker Automation™, Inc.
P.O. Box 6368
Moraga, CA 94570 (USA)
1-510-601-9396
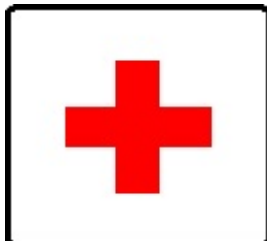Fax: 1-510-601-9398
1-877-444-ABLE (2253)
Home Page: www.able-baker.com
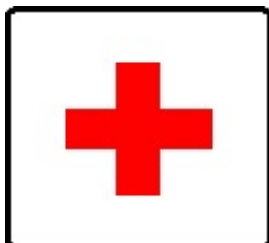
Filling Machine for Pharmaceutical Product

Description: This machine automatically dispenses a controlled dosage of a drug. The dosage weight requires a high accuracy.

Hardware: Allen Bradley ControlLogix with 3 servo axises. The servos utilized the SERCOS control bus. The control panel wiring was connected to junction boxes mounted under the aseptic glove box. A separate computer acting as a thin-client for the Wonderware application, also had a programmable frequency generator output. We also provided a serial to ethernet connection to a Mettler scale to provide information for the Statistical Process Control system.

Operator Interface: The operator interface included Wonderware running on a remote server and two thin-clients with touch screens mounted next to and inside the aseptic glove box. These included SPC control charts displayed in real time.

Engineering Activities: Control System Design, Control System Wiring Diagrams, Programming, Documentation, assistance with Validation and Start-Up

System Documentation: Control Description, Testing Procedure, Drawings, PLC Ladder Program, I/O Listing, Cross Reference. We also assisted with the preparation of the Validation documentation.
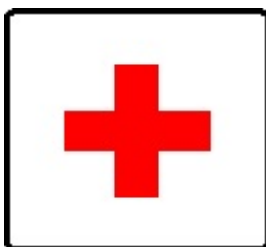
Description: This machine automatically dispenses a controlled dosage of a drug in a batch process. When the batch is complete a Batch report is prepared as part of the FDA validation procedure.

Hardware: The system utilized redundant fault-tolerant servers. One set acts as an application server for the Wonderware human machine interface (HMI) software. The other set acts as an SQL server. Wonderware In-SQL was used to acquire information for the SQL databases.

Operator Interface: At the completion of the batch the Wonderware application triggered a Microsoft Access program that acquired data from the SQL databases, and prepared a report. This report included all of the samples used in the SPC calculations and the SPC charts.

Engineering Activities: Wonderware Application and SPC set up, InSQL and SQL queries and Access Program.

System Documentation: Control Description, Testing Procedure, Drawings, Programs and computer configuration information. We also assisted with the preparation of the Validation documentation.
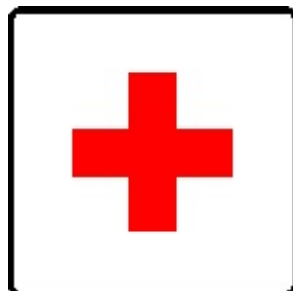
Manufacturing Machine for Dosage Forms

Description: This machine automatically produces dosage forms for an inhaled pharmaceutical product. The dosage forms have very tight tolerances.

Hardware: An Allen Bradley PLC5 and Intellution iFix Workstation provide the control for this machine. The iFix communicates to the IVEK syringe pumps. The machine also has 3 servo axis controllers (Galil, API, and Pacific Scientific). Another computer controls the inspection cameras.

Operator Interface: The Intellution iFix Workstation acts as the Operator Interface. This is a Validated system (21CFR) in an Aseptic clean room.

Engineering Activities: Electrical Wiring Diagrams, Program Modifications, Documentation, Assistance with System Validation, and Start-Up.

System Documentation: Assistance with IQ/OQ/PQ Validation Documentation, PLC Ladder Program, Motion Control Program Documentation, Intellution Documentation.

DANGER
THIS MACHINE STARTS AUTOMATICALLY

Medical Diagnostic Machine Prototype

Description: This project was to design a prototype for a medical diagnostic machine to be used in hospitals and clinics. This device uses a proprietary sensor for one of the measurements and automatically reads test strips for the other tests.

Hardware: An embedded computer with vision and high precision analog inputs and outputs. Custom interface for the proprietary sensor which provided a resistance signal. This resistance varied over 6 orders of magnitude. Test strips were read by a camera and the data analyzed to determine the absence or presence of faint lines.

Operator
Interface: The prototype machine used a Visual Basic interface. This will be replaced with a dedicated display and integral thermal printer on the final device.

Engineering
Activities: Control System Engineering and Programming. Custom software for testing the system.

System
Documentation: Control Description, Complete Program Listing, Database Printout, and Cross Reference Listing. Complete system drawings were also supplied.

Test Machine for Disposable Medical Apparatus

Description: This machine automatically performs 33 different tests on a disposable component for the automatic mixing of Nutrients. A leak test with a threshold of 5 cc/minute was implemented using a high precision thermal type flow meter. All tests are performed automatically and the operator is notified of any failed components. All tests are performed within one minute to allow 100% testing of the product.

Hardware: Control Technology Corporation Model 2600 Automation Controller with Digital I/O, Analog Inputs, Thumbwheel Inputs and an Analog Display Output.

Operator Interface: Conventional Pushbuttons, Pilot Lights and Alarm Units. Six 4 digit thumbwheels are used to input setpoints.

Engineering Activities: Control System Design, Programming, Documentation and Start-Up

System Documentation: Complete Program Listing of CTC's Quickstep "Direct Sequential Programming" Step Logic, I/O Listing, Cross Reference, and Detailed State Diagram.

DANGER
THIS MACHINE STARTS AUTOMATICALLY

Pharmaceutical Bag Production Machine

Description: This machine produces pharmaceutical bags up to 1000 liters. The operator can set up the machine to work on several different configurations. Three port stations, two side seals, an end seal and a cut station are supported. The Operator programs the move lengths into the drive and cut unit.

Hardware: Seimens/Texas Instruments 430 PLC with Omron timers and Love temperature controllers.

Operator
Interface: Conventional Pushbuttons, Timers, Controllers, and Pilot Lights are used. A matrix of illuminated maintained pushbuttons are used to configure actions for up to seven different moves per bag.

Engineering
Activities: Control System Design, Wiring Diagrams, Panel Layout, Programming, Documentation and Start-Up

System
Documentation: Control Description of system, Complete Ladder Listings, and Wiring Diagrams.

Scale Modification for Resin Mixing System

Description: The system automatically combines 5 major liquids (greater then 200 lbs/batch) and 5 minor liquids (less then 200 lbs/batch) and notifies the operator to add the dry ingredients. The minor ingredient scale was modified to improve system performance by increasing communication speed and improving precision. The system produces 6 different formulas and controls storage tanks for automatically discharging to glove machines. Complete Batch reports and material Inventory reports are produced. The system controls 150 solenoid operated ball valves.

Hardware: Allen-Bradley PLC 5/25 with Digital I/O, Analog Inputs, and a Basic module providing communications to 6 local panels, each with a Cincinnati Electrosystems 20 Character Message Unit and 8 digit keypad. Two additional Basic Modules are used to communicate with the Mettler scale systems used in weighing each mixer.

Operator Interface: A Nematron 4000 Workstation (Panel Mounted 286 Computer) running the Screenware Operator Interface Program. The computer is used for system monitoring and control and provides password controlled access for recipe changes. A rework capability is included for automatically re-running batches. Each mixer has a Local Panel for the operator to use. The keypads are used to enter operator ID numbers and Resin Lot numbers.

Engineering Activities: Modify Wiring Diagrams, PLC Programming, Screenware Programming, System Documentation and System Test Procedures for FDA Validation.

System Documentation: Control Description, Operating Manual, Software Documentation including Screenware Application and Screen Files, and System Test Procedures.