

# Project Profiles

Machine & Motion Control



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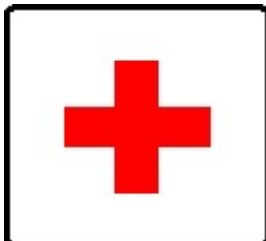
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# Filling Machine for Pharmaceutical Product

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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 axes. 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.



# Telescope Dome Rotation

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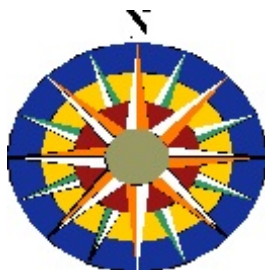
Description: This moving portion of this telescope dome measures 50 feet in diameter and 30 feet in height. Rotational accuracy is better than +/- 3 arc-min.

Hardware: Allen Bradley CompactLogix controlling 8 SEW Vector drives. The drives and the PLC communicate over EtherNet I/P. The rotation is measured using two Allen-Bradley absolute encoders communicating over DeviceNet. The doors are controlled by another CompactLogix mounted on the rotating dome.

Operator Interface: The operator interface for maintenance and testing is a PanelView+ 1250 HMI. The normal control is done remotely over a proprietary network.

Engineering Activities: Control System Design, Control System Wiring Diagrams, Programming, Documentation, assistance with Validation and Start-Up. Special documentation for communication with custom software to be developed by others.

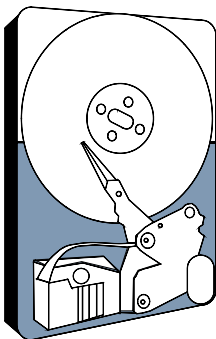
System Documentation: Control Description, Commissioning Report, Drawings, PLC Ladder Program, I/O Listing, Cross Reference.



# Manufacturing Machine for Disk Texturing

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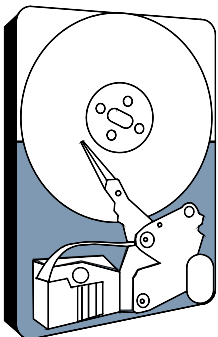
Description:	This machine automatically feeds hard drive disk media from cassette holders onto an air bearing spindle. The spindle is then rotated and the laser texturing occurs. The media is then removed from the spindle and placed back into the cassette. This machine processes 200 disks per batch in under 45 minutes.
Hardware:	An IBM industrial computer with two 8-Axis stepper/servo control boards is used to control 4 servo motors and 8 stepper motors. In addition the laser disk processing is controlled by the computer.
Operator Interface:	Microsoft Visual Basic was used to create the operator interface. An easy to use graphic interface was created. A separate pendant is available for system set-up.
Engineering Activities:	Control System Design, Electrical Wiring Diagrams, Programming, Documentation, Material Procurement, Assembly, Installation and Start-Up.
System Documentation:	Control Description, Software Documentation, Maintenance Manuals, Visual Basic Program Listings and complete system drawings.



# Auto-Focus Addition to Disk Laser Texture Machine

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Description:	An Auto Focus mechanism was added to the hard drive media Laser Texture machine. This mechanism automatically re-focused the laser for each disk.
Hardware:	A pair of cameras connected to a Data Translation frame grabber card provided the input for the system. The focus distance was controlled using a stepper type output to pico positioning drives. Two additional cameras were used to verify that the disks were properly textured.
Operator Interface:	Visionblox DLLs were added to the Microsoft Visual Basic application to analyze the camera data. The original application was modified to incorporate these functions.
Engineering Activities:	Control System Design, Electrical Wiring Diagrams, Programming, Documentation, Material Procurement, Assembly, Installation and Start-Up.
System Documentation:	Control Description, Software Documentation, Maintenance Manuals, Visual Basic Program Listings and complete system drawings.



# Manufacturing Machine for Dosage Forms

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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/PO Validation Documentation, PLC Ladder Program, Motion Control Program Documentation, Intellution Documentation.



# Manufacturing Machine for Wire Marking Product

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Description:	This machine automatically unwinds reels of tubing, performs controlled flattening and automatically assembles a ladder type wire marking product. Automatic sensing of tubing width, thickness, camber and product progression are integrated into the machine's control system. Several different tubing widths can be used. A 19" Touchscreen is provided for operator control.
Hardware:	Allen Bradley PLC 5/15 PLC Controller and IMC-123 three axis servo control modules provide system control. (Two independent axes are programmed.) Two 1771-DB Basic modules are used to communicate with a Keyence Laser Gauge and Dwyer Temperature Controllers. The system also controls the Komatsu 25 ton press for cutting and assembling the tubing.
Operator Interface:	USData Factorylink is used to monitor machine operation and to download recipes for different products. (Including move lengths, temperature setpoints, and specification parameters.) A complete SPC package is implemented and data logging provided.
Engineering Activities:	Control System Design, Electrical Wiring Diagrams, Programming, Documentation and Start-Up. Complete configuration of the FactoryLink system.
System Documentation:	Control Description, Software Documentation, FactoryLink Configuration, Basic Program Listings and complete system drawings.



# Manufacturing Machine for Medical Apparatus

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Description:	This machine automatically performs Ultrasonic Welding on a complicated plastic part. Two dimensional motion control is implemented to position the part. The machine then automatically performs the Ultrasonic Welding.
Hardware:	Seimens (TI) 435 PLC Controller and Delta Tau Data Systems Smart Motion Controller Card provide the controlling logic. The PLC is interfaced to the Branson Ultrasonic Welder.
Operator Interface:	Conventional Pushbuttons, Switches and Pilot Lights.
Engineering Activities:	Control System Design, Electrical Wiring Diagrams, Programming, Documentation and Start-Up
System Documentation:	Control Description and Complete Program Listing of Delta Tau SMCC Motion Control Program, PLC Ladder Program, I/O Listing, Cross Reference, and Sonic Welder Parameters.

