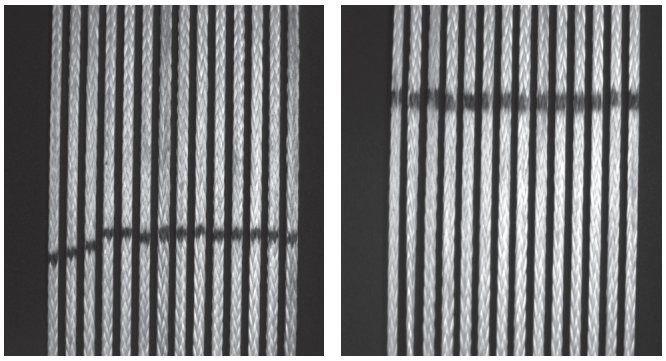
Vision-based PID Control System

The Challenge

A technology company that produces advanced sensor products wanted to monitor and control a manufacturing process used in the fabrication of materials used for towed arrays.



Machine Vision screen captures of predrawn marks.

The Solution

PVI Systems developed, built, and installed a custom Process Control System for the material fabrication machine.

Using **Machine Vision** technology, the system monitors predrawn marks at a user-specified separation distance and then outputs 14 control voltages (one reference and 13 variable) to control the machine's drive brakes. System accuracy is dependent on several factors with the two most critical being strand marking accuracy and the camera resolution along the length of the strands. The amount of fabric stretch is also monitored with the same camera system. Two additional brake voltage control signals are used to control the material stretch, as well as another brake. Additionally, the system monitors two tension sensors and three encoders. The tension and counter data is displayed on a PC and stored to file. The encoders are also used to monitor for slippage. If the encoders differ by more than a user specified amount, the system will be considered to be in a slip condition and the operator will be alerted (on-screen).

PVI engineers built the machine vision system, designed overall software architecture and individual processing modules, installed the system to the fabrication machine, and tested its integration.

System Features

- RS-170 Progressive Scan Camera
- IMAQ Driver
- PCI-1407 Frame Grabber
- 16 Channels Voltage Output
- 16 Channels Voltage Input
- 4 Channels Counter Timer

This project was the final component in the complete system assembly, therefore it was critical that it was manufactured properly. Overall, the system saved the company time and money be reducing error and waste. After 15 years, the control system is still in use with some upgrades to controllers and software.

Gold Partner
SYSTEM INTEGRATION

Contact us for more information about custom-engineered Machine Vision, Process & Motion Control, Data Acquisition, Automated Test & Measurement, and systems.

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