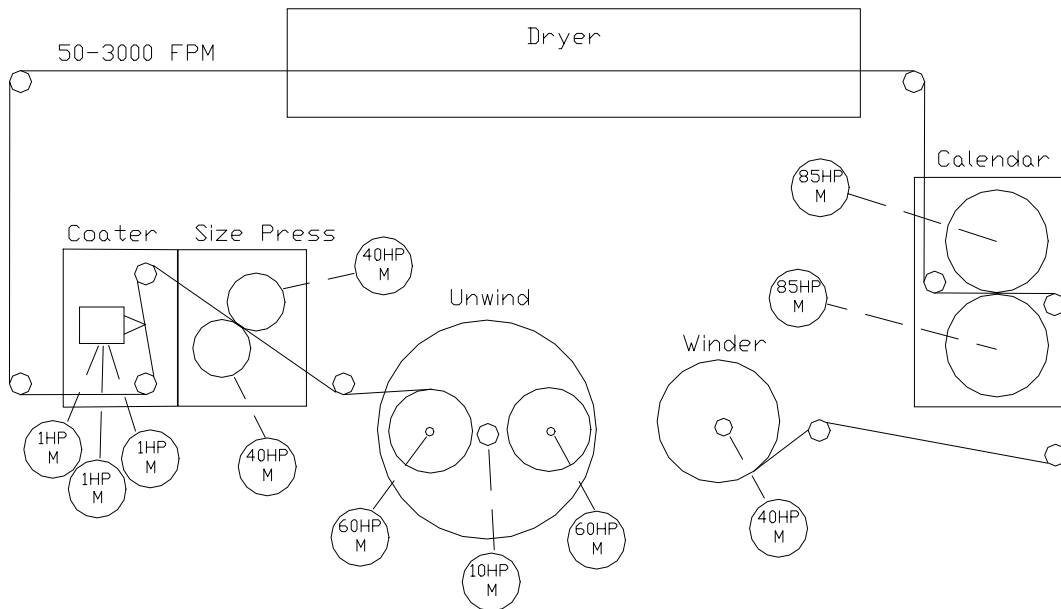


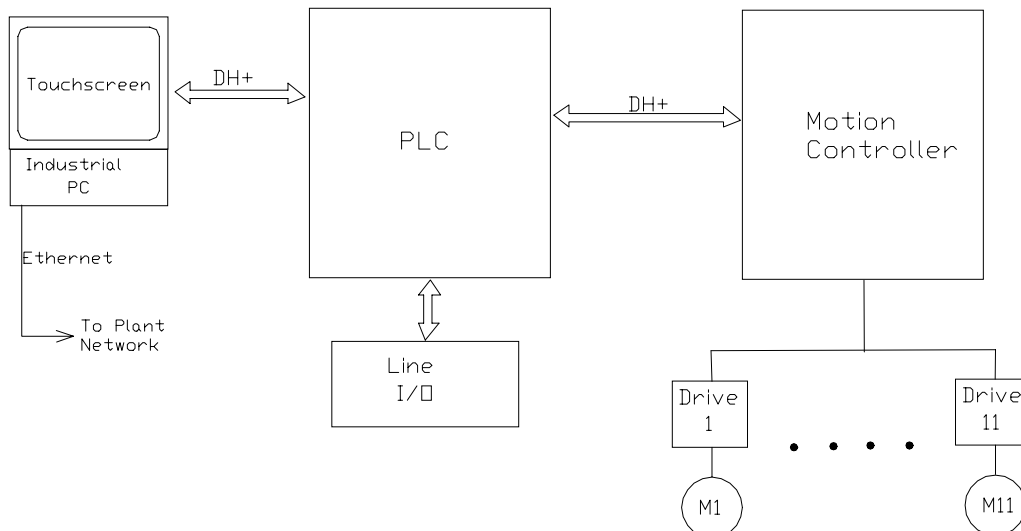
Innovative Ideas In Motion

Paper Coating Line

I²T designed the control system and wrote the application software for an eleven axis paper coating line.



The following shows a block diagram of the control hardware used.



The paper coating line consists of the following major components: Turretting Unwinder/Splicer, Size Press, Coater, Dryer, Calendar, and Winder.

The unwind/splice stand unwinds rolls of paper that are 106 inches wide and weigh 8000 pounds at speeds ranging from 50 to 3000 feet per minute. New rolls are spliced in on-the-fly providing continuous paper flow while maintaining precise tension.

The coater consists of two coating heads and two 40-inch rubber rolls. The coating heads apply a controlled film of coating to the paper while the rubber rolls remove excess coating from the paper, leaving the proper coating thickness. The rubber rolls work to maintain an accurate tension on the paper while in the coating section.

The paper then travels through a dryer where the coating is dried. The dryer is a 150-foot oven where precise heating and airflow are maintained. This provides uniform coating texture.

The paper then travels through a set of calendar rolls. The calendar system consists of 4 rubber covered bender rolls and 2 steel king rolls. The king rolls are heated using a hot oil system. The rubber rolls press against the king rolls using hydraulic pistons, generating a force of 200,000 pounds on the paper. The result of this process is paper with a high-gloss finish with an exact thickness.

The finished paper is then wound back into rolls. The gain of the winder is changed as the roll grows to account for the change in load inertia. Taper tension is also used while winding.

A PC-based data collection system was put on the line to monitor all torques and tensions in the system. This system is used to increase line performance and optimize the paper quality.