Conclusion

Though simulation in Multisim and building a prototype we were able to prove that the pick and place machine could have the control system updated using microcontrollers.

Multiple microcontrollers would be needed but due to their low cost this makes it a viable cost effective way of bringing the pick and place machine into the 21st century and give it a new lease of life.

Using a modular, distributed control system using interchangeable microcontroller PCB’s and controller PCB’s has lowered the cost of keeping the pick and place machine running for many years. As newer technology’s appear each module can be upgraded.

With no documentation on the current pick and place machine we had to make a lot of assumptions, reading values from the motors and assuming there were going to run at their maximum voltage and maximum current as a worst case, the H bridge was over designed to take this into account.

With the information we have provided in this project documentation future projects on the pick and place machine will have a better start than we did. Not only did we have to decide on a data bus from the main computer to each controller we also had to find a microcontroller with a high speed quadrature input.

The pick and place machine is built around a feedback system using a quadrature encoder which limited us to the ARM based Arduino DUE which took every one in the team from their usual choice of microcontroller.

As a team we found the project challenging having to design the hardware and the software.