SUMMARY

Throughout the making of this thesis numerous topics have been covered. Essence of my task was to interface a professional industrial sensor onto a Dimusa controller, prior knowledge of which does not exist. This goal has been successfully accomplished. I took time to analyse the capabilities of my sensor and my board to construct a vibrational monitoring system. There have been considerable challenges whilst working on this project associated with the lack of documentation and with EM noise produced by the power supply. The latter was the biggest problem as for a considerably long period of time, it was not clear what was the issue with the sensor. These particular case was solved through consulting the sensor manufacturer directly and following their recommendations on noise minimisation.

It is demonstrated that the final system can successfully record the bidirectional acceleration and send them to the online cloud. It is however important to note, that the vibrational values may depend on the fixation of the rolling bearing. One other observation in my readings is that, since the healthy and the damaged rolling bearings were side to side, considerable amount of vibration from the damaged rolling bearing had been transferred to the healthy one. One considerable disadvantage to this system is that an integrated ADC is utilised, which can not guarantee correct values.

In the near future, improvement steps mentioned in Chapter 5 need to be implemented to increase the functionality and the reliability of this system. This is something that I would like to work on personally as the demand for such device in the industrial world will be very high, as long as the costs are kept reasonably low.

This solution based on a Dimusa controller, once commercial ready, can be implemented and used for predictive manufacturing systems, lifespan analysis, real-time vibrational analysis, testing the vibrational balancing systems and many other applications. Contrary to the solutions on the market, all the data processing is done on the device itself. It would not rely on the serial port to Bluetooth communications and third-party spectrum analysing software. These individual monitoring units can be placed on any motor and with web development, an interactive interface could be added to represent the current status of the motors, live-spectrum analysis, vibrational history and etc. This device also has a potential to work as a data gathering tools for producing Big Data of vibrational patters, applicable for developing useful machine learning models for predicting damage.