Assessment schedule/Mahere Aromatawai: Digital Technologies & Hangarau Matihiko 91904 – Battery powered water irrigation system

Evidence/Judgements for Achievement/Paetae	Evidence/Judgements for Achievement with Merit/Kaiaka	Evidence/Judgements for Achievement with Excellence/Kairangi
Use complex techniques to develop an electronics outcome. The student has: ● used appropriate resources and techniques to develop a functional outcome The student has developed a functional electronics outcome that meets specifications. Each interface works, and the student is able to demonstrate a working Battery Powered Irrigation System. ● constructed, tested, and analysed functional circuits to ensure the electronics outcome performs to specifications The student may show evidence of: − analysing analogue data gained from moisture sensor in relation to soil moisture content − testing the input interface on expected sensor inputs, on expected automated timing events, on expected manual interrupts − testing the output interfaces to show display on LCD and/or valve open close − modifying code beyond any template or teacher supplied code samples − analysing power output of solenoid (current draw) and its effect on power supply stability. ● tested, modified, debugged the outcome	Use complex techniques to develop an informed electronics outcome. The student has: ● used information from testing and analysis to ensure the circuit(s) functions reliably The student is able to test and show reliability in their electronics outcome. This may include a selection from: − Improved analysis and performance of an analogue moisture sensor. − Well organised breadboard layout with no loose components. Evidence that the system can function in a consistent manner in its intended location. − Soldered components on a Vero board or Kiwi Patch board or Printed Circuit boards will provide evidence of improved reliability and robustness as long as the system is proven to work in a consistent manner in its intended location. *The examples above are indicative samples only*	Use complex techniques to develop a refined electronics outcome. The student has: ● undertaken iterative improvement throughout the design, development and testing process The student shows evidence of iterative design, development and testing within the process of constructing the electronics outcome. The student should be able to show − multiple instances of development, testing and consequent iterative improvements that lead to a functional outcome − trialling in the outcomes intended location to determine the outcome is fit for purpose The student was able to produce evidence of the project developing in expected stages, and that after a series of investigation, research and trialling it was further developed, tested and refined. This process was evident throughout the project. ● justified the choice of components and subsystems The student is able to justify the choice of components**.** They are able to compare competing components, interfaces for the same purpose and justify their decisions in using one over the other. **For example (partial evidence)** "*I decided to use a RTC to automate the timing of*

The student shows they have tested sensor-controlled events, timer-controlled events and manual interrupt events that allow water irrigation system to work to specifications. ● explained the behaviour and function of the electronics outcome and relevant communication protocols The student has explained the behaviour and function of selected interfaces or components within their electronics outcome − Real Time Clock RTC, how it functions and how the student has used I2C protocols to interface with it − software flags and interrupts and how a microprocessor handles interrupts − explained relevant communication protocols ● addressed relevant implications The student is able to address implications. For example (partial evidence): − has well-structured code The student's software code is well structured, including variable and constant declaration. Code comments etc. − functions as intended. The student resolves any issues that affect the functioning of the system. − is reliable. The student addresses concerns over reliability that may include soldering components onto a board, enclosures with mounted components, secure wiring. − meets all copyright or intellectual property concerns		*the water irrigation system over moisture sensing as I found that the pot plant was in a more stable environment" …." After analysis of max water capacity of the pot plant I was able to modify the timing of the valve to avoid over watering …"* ● justified the choice of communication protocols **For example (partial evidence)** *"I used RS232 Serial data communication because it is good to see what information is being captured, RS232 allow me to connect my laptop up to the water irrigation equipment and get live data from the sensors whereas TTL suffers from noise, interference, and degradation."* *The examples above are indicative samples only*