

STUDENT FEEDBACK FORM: KIERAN PRESCOTT

Generic Assessment Criteria	Mark s ava ila ble	Mar ks awar ded
1. Engagement with Literature Skills: Show you have researched and used reliable sources to support your ideas. Include key theories and up-to-date information about mechanical dynamics, control systems, and software like MATLAB Simulink with proper referencing (Harvard style).		
Feedback: You include a small set of relevant sources that link to the scenario, particularly around multi-sensory and non-harmful deterrents. For example, you reference the idea that “multi-sensory, non-harmful deterrents can reduce primate crop damage”, which shows awareness of the wider application context. You also acknowledge MATLAB/Simulink as a tool and include related documentation in your reference list, which is appropriate for this type of work. Feedforward: The range and quality of sources is currently too narrow and not sufficiently focused on dynamics and control engineering. For a Level 4 dynamics and control systems assignment, you should engage more directly with academic literature related to modelling and control, such as first-order system modelling, sensor characteristics (including noise and filtering), threshold systems, reliability considerations, embedded control design, and low-power system design. At present, the literature base is more focused on general deterrent concepts rather than control and systems engineering principles. Referencing also needs significant improvement. Harvard referencing is inconsistent, and in-text citations are not used effectively to evidence reading throughout the report. Only a small number of sources are cited in-text, while other claims (for example, regarding energy use, autonomy, and system performance) are left unsupported. This weakens the academic credibility of the work. Some sources currently included are not appropriate for academic support. For example, <i>MATLAB Documentation (2024) Simulink User Guide</i> is not presented in correct Harvard format (it requires clear corporate authorship, full publication details, and access information if online). Similarly, <i>Prescott, K. (2026) Unpublished video recording</i> is not a suitable academic source for substantiating technical claims about system performance and should not be relied upon in a report of this level. To improve, ensure that all key technical statements are supported by appropriate academic or industry-standard sources, and that referencing is consistent, complete, and applied throughout the report rather than only in selected sections.	15	7
2. Knowledge and Understanding Skills: Demonstrate that you understand the main concepts and principles behind your project, explaining how they relate to designing the monkey deterrent system and its challenges.		
Feedback: The system overview is clear and logically structured, following a sensible flow from sensing through logic to actuation. You also demonstrate an appropriate Level 4 understanding of basic system modelling by introducing first-order actuator dynamics and identifying key components such as the PIR and LDR sensors and the system outputs. This provides a solid foundation for describing how the system operates. Feedforward (how to improve next time): The control and dynamics aspects of the work need to be developed further. At present, the system is mainly described in terms of logic-based switching with simple first-order blocks. There is limited engagement with core control engineering ideas such as what variable is being controlled, how the plant is defined, and what meaningful feedback exists beyond threshold triggering. As a result, key performance aspects such as stability, robustness, and response quality are not fully explored.	20	14

The classification of the system as “closed-loop” also requires clearer justification in control terms. You should explicitly explain what feedback mechanism exists and how (or whether) it influences system behaviour in a regulated way. In addition, several key engineering parameters require stronger justification. Time constants (e.g. 0.5 s, 0.2 s, 0.3 s) are currently stated without supporting evidence. These should ideally be derived from datasheets, experimental data, or credible literature sources. Justifying parameter choices in this way will significantly strengthen the technical credibility and rigour of your modelling.		
3. Cognitive and Intellectual Skills: Use your analytical skills to develop and explain models, interpret results, and justify your design choices with clear reasoning and evidence.		
Feedback: Your modelling choice is coherent and consistent. Using step inputs, logic gating and first-order dynamics produces outputs that are easy to interpret. You also correctly explain the arming delay behaviour and show that outputs remain inactive until the arming condition is satisfied. In addition, you identify relevant modelling limitations such as noise, sensor variability and wear, and you suggest sensible future improvements including battery discharge modelling, randomised deterrent patterns and additional sensors. Feedforward: At present, the analysis is mainly confirmatory (i.e. stating that the system “works as intended”) rather than being evaluated against clear performance metrics. To strengthen your work, you should define measurable criteria and test the system against them. For example, you could evaluate response time after PIR detection, resilience to false triggers, duty cycle, energy consumed per activation, and overall battery autonomy. There is also an inconsistency in the Simulink “day-time scenario” results. Based on your description, daytime conditions should correspond to low light (LDR behaviour), however one of the plots suggests that the Light Dynamics output increases during the daytime run. You should carefully check and clearly reconcile what each figure represents, explicitly stating which signals are being plotted and why the observed behaviour is correct. To further improve the depth of analysis, include at least a brief sensitivity test. For instance, vary the LDR threshold, introduce a pulsed (rather than constant) PIR trigger, and observe how these changes affect system outputs and energy usage. This will help demonstrate how robust your system is under different operating conditions and strengthen the evaluation significantly.	20	13
4. Practical Application Skills: Apply what you know by modelling and simulating the system, considering real-world factors like cost and power supply, and show how your design works in practice.		
Feedback: You demonstrate strong practical capability through your Arduino implementation and your description of real-world considerations such as the arming delay, kill switch/manual override, and PIR sensor placement to reduce false triggers. The linkage between your Simulink logic and embedded implementation is also clear, and your prototype behaviour (e.g. arming LED indication and PIR settling logic) shows sound engineering judgement. Your inclusion of solar operation is appropriate and aligned with the scenario constraints. Feedforward: The costing section needs to be made more rigorous and transparent. At present, the estimate (£28–£33 depending on supplier) is too vague. You should present a structured bill of materials including individual components, unit costs, quantities, and sources. In addition, the brief requires consideration of feasibility using locally available materials in Zimbabwe, whereas most of your sourcing is currently UK-based. Addressing local availability would significantly improve the realism of your design. The solar power sizing also needs a clearer engineering approach. Rather than providing a single headline figure (e.g. “1 Wh/day”), you should show the full method: a simple energy budget table distinguishing active and standby current draw, clearly stated duty cycle assumptions, and then use these to calculate battery capacity and solar panel sizing from first principles. This will strengthen the technical validity of your design decisions. Finally, if the system is described as “closed-loop”, this should be more precisely defined. Your implementation is better described as a discrete, event-driven control system (sensor → logic → actuator), rather than a continuous	20	17

feedback control loop regulating a physical variable such as speed or position. This is acceptable for the application, but it should be labelled accurately and justified clearly in control terms.		
5. Transferable Skills for Life and Professional Practice: You will be assessed on how clearly and professionally you write your report and organise it (15 marks). Your ability to present your work confidently and effectively in the presentation and answer questions will be evaluated. This includes communication, organisation, and attention to detail (10 marks).		
Feedback: Your report writing is well structured, with a clear table of contents, logical sectioning, and a generally professional tone throughout. You make good use of diagrams and screenshots to evidence your Simulink build, which helps to support your technical work. Your PowerPoint presentation is also clear and concise, and it aligns well with the overall narrative of your report, making the key ideas easy to follow. Feedforward: To improve the professionalism of your report, focus on correcting formatting and typographical issues. All figures should also be consistently labelled and numbered (e.g. Figure 1, Figure 2, etc.) and include clear, descriptive captions. For your presentation, you should add a slide that explicitly links requirements to verification. This should show how each requirement was tested or validated within your system. Including at least one quantified result would also strengthen your presentation, such as arming delay timing, response time, or an estimated energy budget. Finally, ensure consistency in academic tone and strengthen proofreading throughout the document. While your use of terminology such as “behaviour” and “modelling” is generally correct, the overall presentation would benefit from closer attention to detail. In evaluation sections, avoid informal phrases such as “perfectly fine” and instead clearly state what was tested and whether it met the required criteria. Report Writing: 11/15 PowerPoint: 6/10	25	17

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		68
	Up to 1 week late (40% Max)		
	Over 1 week late (0%)		

