

Systems Control in Engineering

A PROJECT APPROACH TO DELIVERY

SMART Homes

The Project Brief – Learner Copy

SMART Homes use a range of micro-generation technologies to provide power generation.

Any surplus power generated can be sold back to the national grid.

You will manufacture an electronic circuit that indicates the balance of energy generation and energy usage, suitable for use in a model SMART home for school use.

The circuit provided by Siemens is suitable for this application.

Your task is to:

- 1 Use CAD simulation to:
 - simulate and test the circuit operation
 - design the printed circuit board.

Use appropriate tools and techniques to:

- manufacture the circuit board
- assemble components to the circuit board
- test and evaluate the operation of the constructed circuit.

- 2 Ensure energy efficiency within a SMART house, an automatic control system is required to control lighting and heating.

Design a control system solution that will enable lighting and heating to be automatically adjusted considering elements such as:

- external temperature
- external light level
- room usage (movement)
- time of day.

Simulate the control system operation.

Transfer the control programme to a programmable device and test.

This work can be undertaken as an individual or as a team. If working as a team all learners are expected to contribute to each of the areas in order to gain the experience and knowledge required to successfully complete the Cambridge National in Systems Control.