

System block diagrams

What is a system block diagram?

A system is made up of a collection of components that make up parts of a sub system, these work together to achieve a specific outcome.

The parts of a system are:

- Input – Interprets a signal from the real world and converts it into a signal
- Process – Changes the signal in some way – this is thought of the brain of the system
- Output – turns the signal back out into a real world signal such as heat or light or movement.

Describing a system

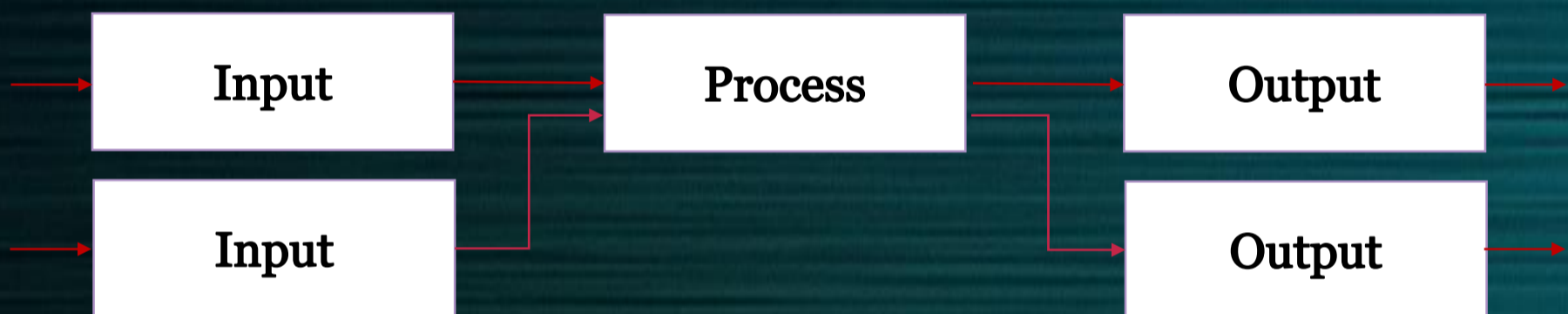
This is achieved by using a series of blocks that represent the functions, the arrows represent the signals sent from and to each block.



System block diagrams

Systems with multiple inputs and outputs

A system block diagram can include many more than one input or output, an example would be a burglar alarm which could have many input sensors and outputs in the form of a siren or flashing LED's.

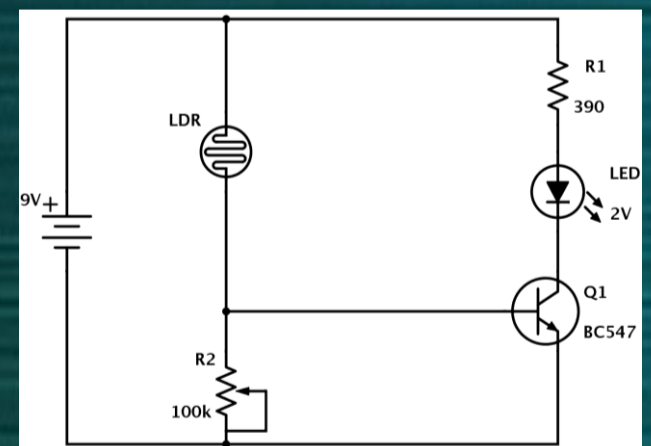


Schematic diagrams

The diagrams are more component specific than system block diagrams and show individual components are joined and used to make a system function.

The use circuit symbols to represent the components and these symbols are to an agreed international standard. This avoids confusion and takes up less space than pictorial diagrams.

Components should be labelled indicating the type of component and where there is more than one of the same component then these should be labelled with numbers to avoid confusion.



Flow charts

Flow charts are used to show the order in which a set of events are carried out. e.g. How a product could be made step by step.

Another use of flow charts is when programming microcontrollers or other programmable components.

The flow chart symbols should always be connected with arrows to show the order of flow.

Symbol	Name	Meaning
	Terminator	Used to indicate the beginning and end of the series of events shown in the flowchart
	Input/Output	Used to show information, data or other items that are either received (input) or given out (output)
	Process	Used to show when an action or instruction is to be carried out
	Decision	Used to show where a choice must be made or a question answered. This must be in the form of a yes/no response.

Describing systems

System block diagrams

Describe the three parts that make up a block diagram

Create a block diagram to represent an alarm clock

How could you add a feedback loop into the alarm system

Schematic diagrams

What are the purpose of schematic diagrams?

What advantage does using schematic diagrams have?

Flow charts

Name the four flow chart symbols

- .
- .
- .
- .

Describe each of their meanings

Create a flow chart for setting an alarm clock

System block diagrams

Form a block diagram for a security light system

Form a block diagram for a kettle used to boil water

Schematic drawing

Look at the circuit diagram (figure 3.1.4), name the components, say what they do and explain the circuit.

Flow diagram

Form a flow chart of making a cup of tea

Form a flow chart for an alarm clock including setting the alarm, time delay, alarm sounding and alarm being turned off.

(Extension, what about when the snooze button is pressed?)