

4 An automated teller machine (ATM) is a device where a person inserts their bank card and can request to withdraw money. The ATM also allows the person to check how much money they have in their bank account.

(a) A sensor is used to detect when a person stands within 1 metre of the ATM. When a person is detected, a welcome message is displayed on the screen.

(i) Identify an appropriate sensor for the ATM to use to detect a person.

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..... [1]

(ii) Describe the role of the microprocessor in detecting the person.

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(b) Describe the features of the ATM that identify it as an embedded system.

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..... [2]

(c) The ATM has a touch screen and a keypad.

The ATM may need to be used by people who are unable to see.

Identify **one** other input device and **one** other output device that can be built into the ATM to help people who are unable to see.

Input

Output