# q-bot

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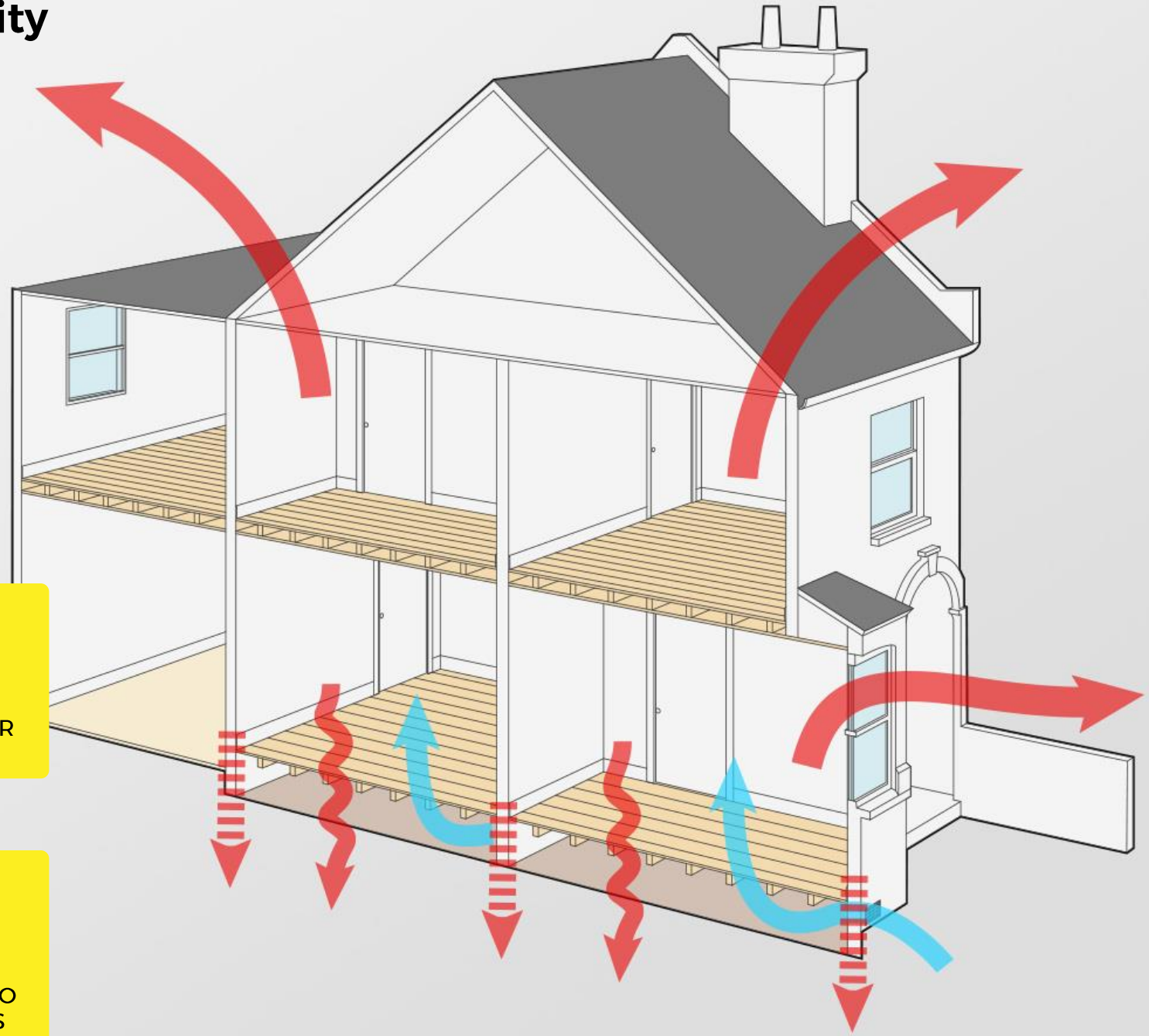
# 1. Opportunity



**>8m**

UK HOMES NEED FLOOR INSULATION

**20%**

OF HEAT LOSS IS DUE TO UNINSULATED FLOORS



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# 1. Opportunity

**Insulating suspended floors is:**

- **time-consuming** (up to 2 weeks);
- **expensive** (up to £10k per installation) ;
- has a **long payback** (>20 years); and
- **hugely disruptive** to occupants.


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# 2. Insulation of suspended floors

## Insulation of suspended timber floors with robots:

- Takes **1-2 days** to install and **minimises disruption**.
- Average install price is **£2,400** or **£400 per SAP point**.
- Reduced with **ECO** funding for **DEFG** rated properties.
- High **performance** and reduces the risk of **damp / mould**.


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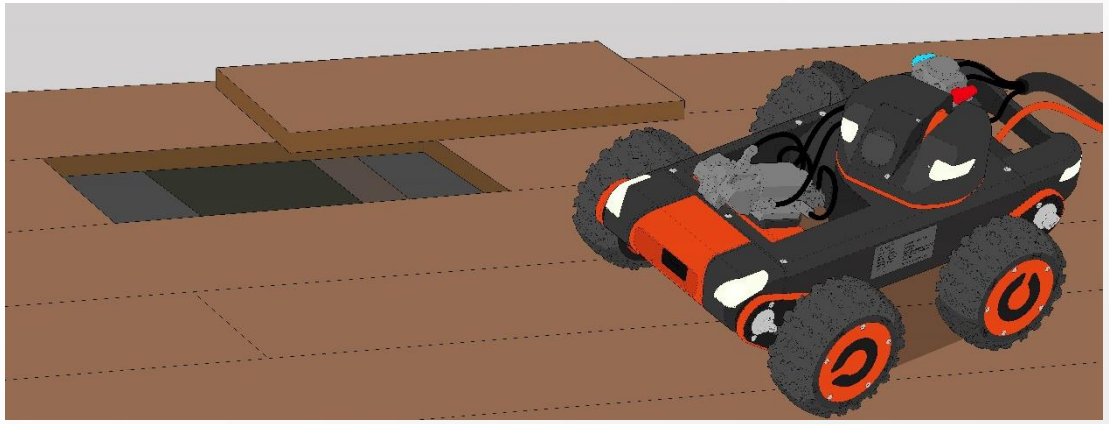
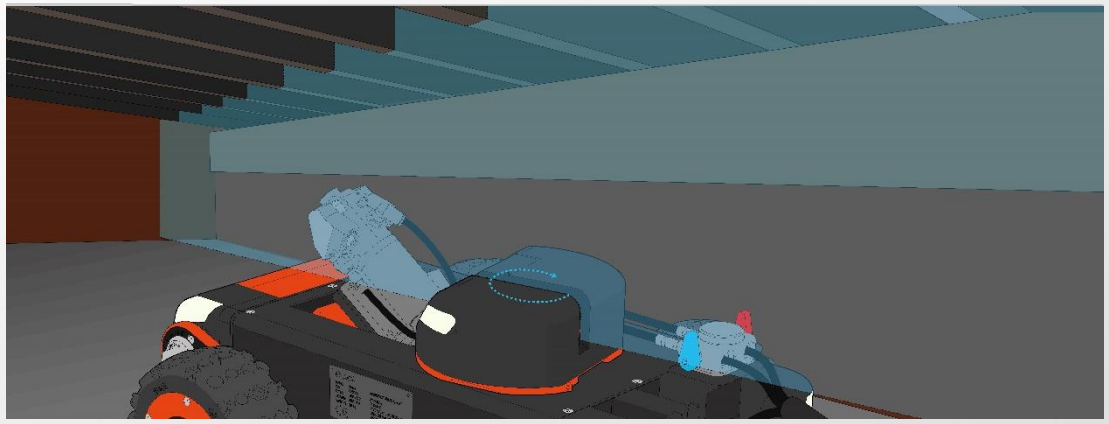
# 2. Insulation of suspended floors

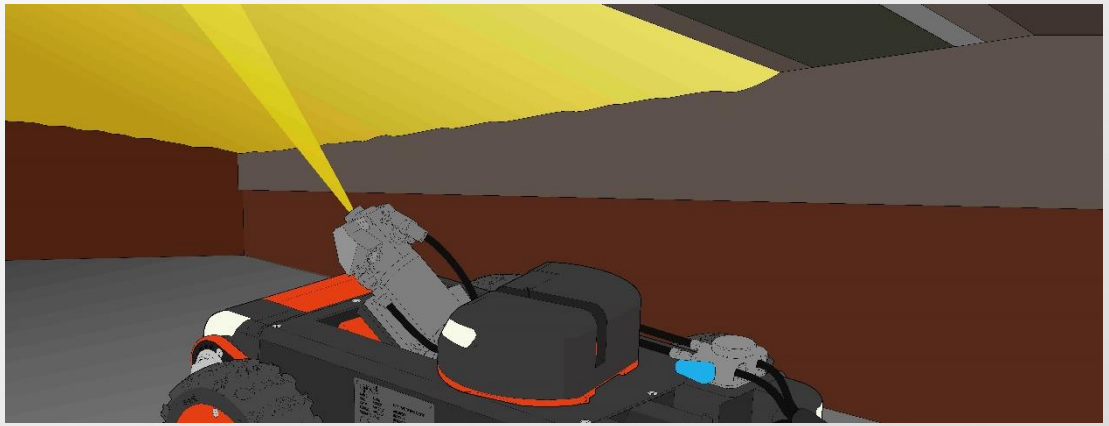
## Stage 1. Access



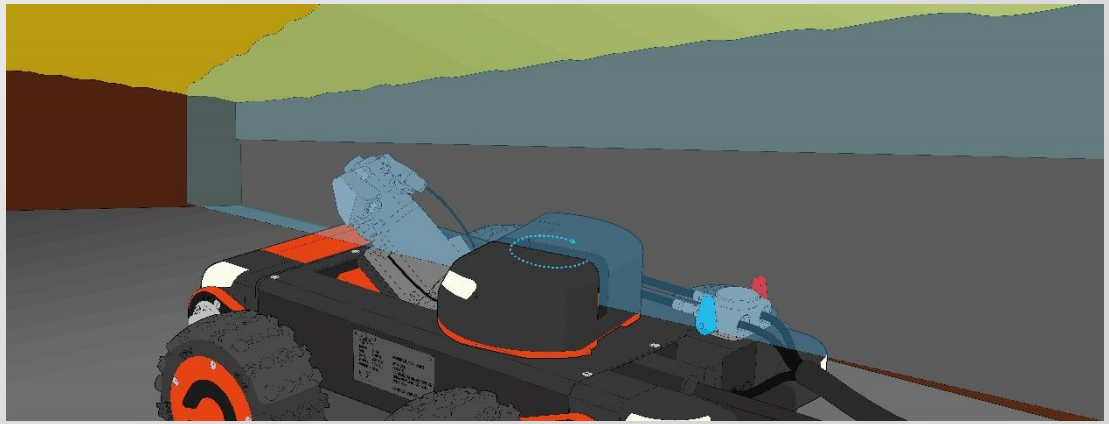
## Stage 2. Survey



## Stage 3. Insulate



## Stage 4. Validate





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# 2. Insulation of suspended floors

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 17/5440


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# 3. Impact

**1/3**
REDUCTION IN DRAUGHTS

TYPICAL SAVINGS OF
**£150/yr**

**90%**
REFERRAL RATE

*"I am much warmer, and I'm saving **£20** per month on bills. I love Q-Bot, it has made a massive difference."*


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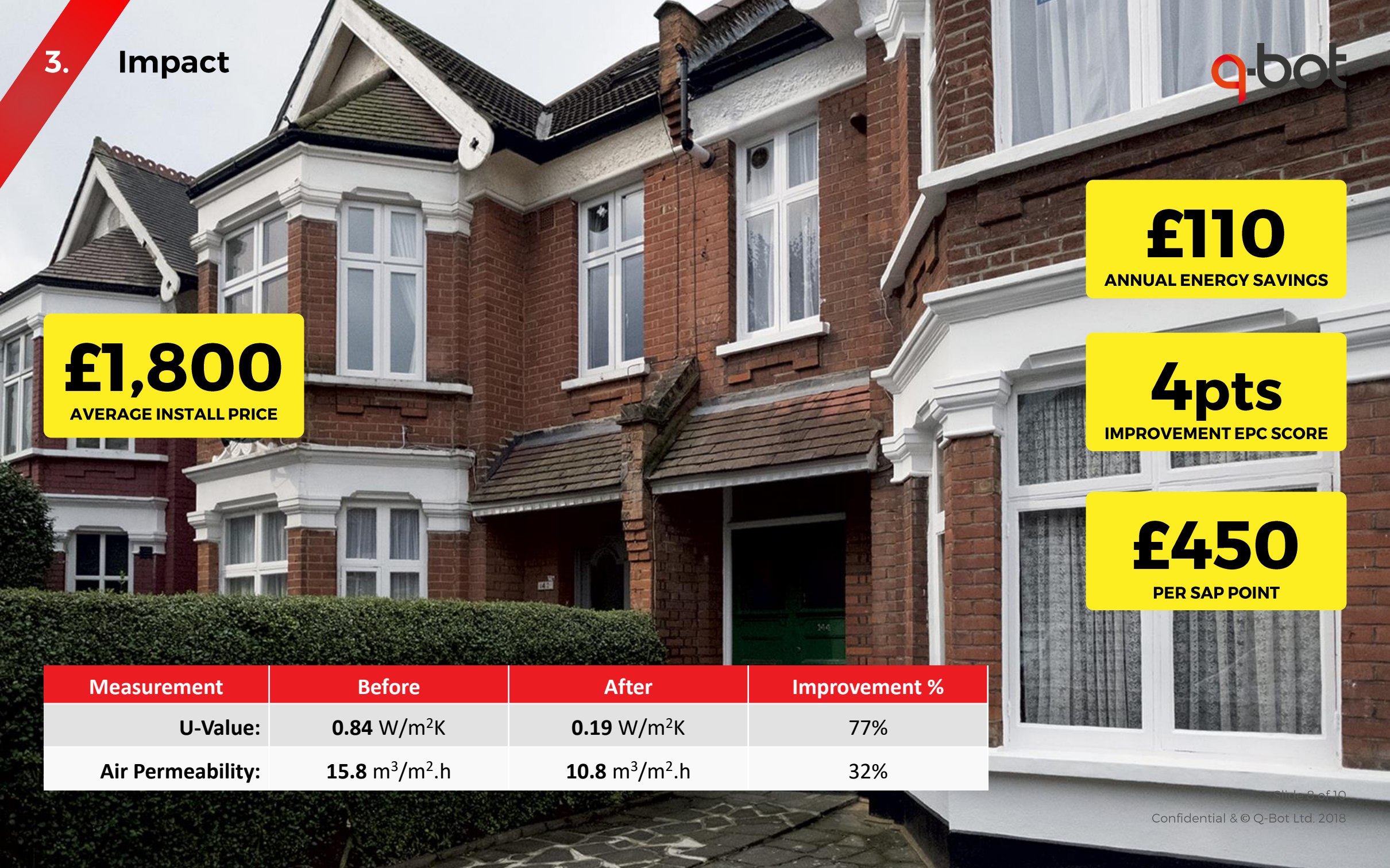
# 3. Impact



**£1,800**
AVERAGE INSTALL PRICE

**£110**
ANNUAL ENERGY SAVINGS

**4pts**
IMPROVEMENT EPC SCORE

**£450**
PER SAP POINT

| Measurement | Before | After | Improvement % |
|---|---|---|---|
| **U-Value:** | **0.84** $W/m^2K$ | **0.19** $W/m^2K$ | 77% |
| **Air Permeability:** | **15.8** $m^3/m^2.h$ | **10.8** $m^3/m^2.h$ | 32% |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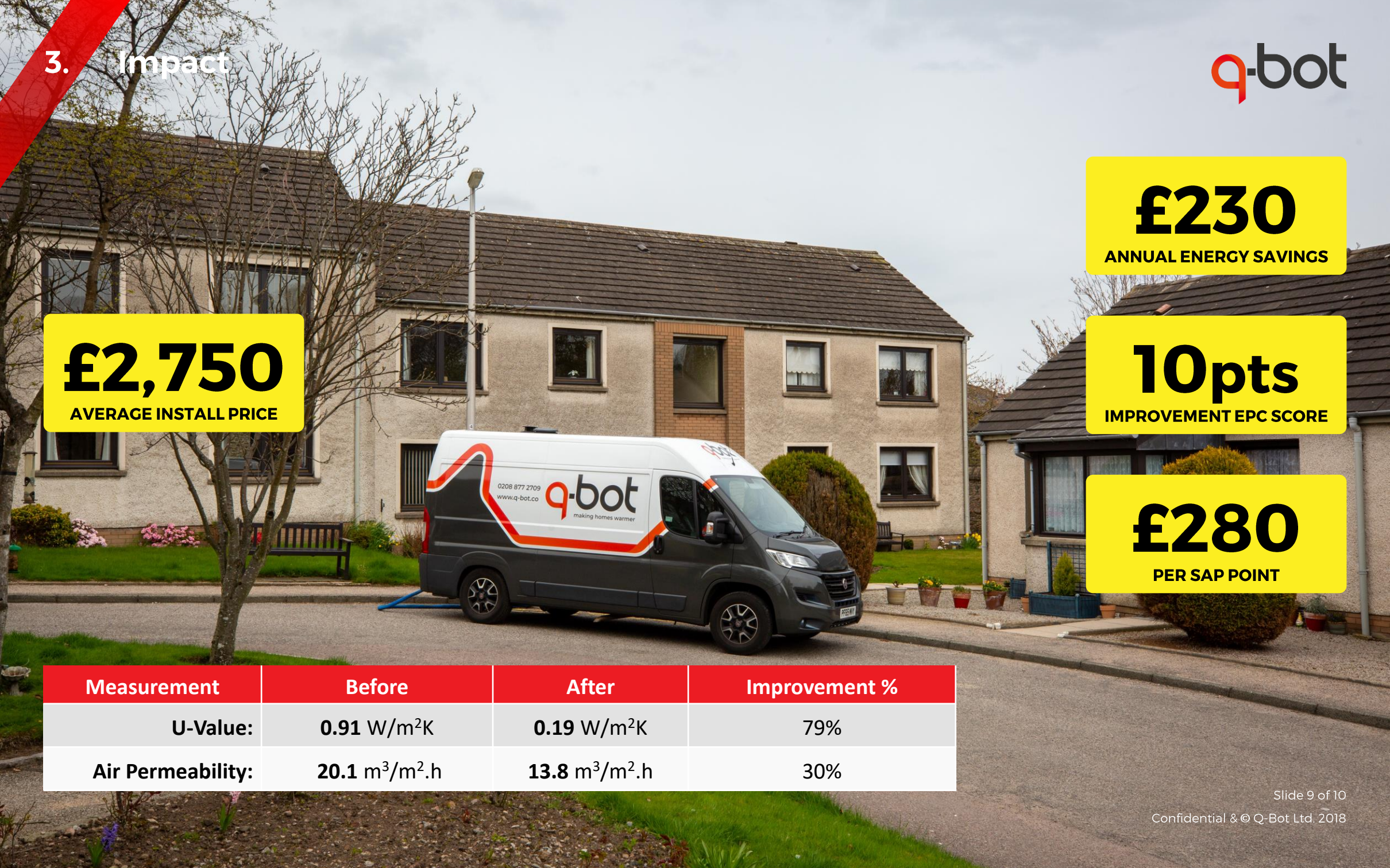
# 3. Impact




**£2,750**
AVERAGE INSTALL PRICE

**£230**
ANNUAL ENERGY SAVINGS

**10pts**
IMPROVEMENT EPC SCORE

**£280**
PER SAP POINT

| Measurement | Before | After | Improvement % |
|---|---|---|---|
| **U-Value:** | **0.91** $W/m^2K$ | **0.19** $W/m^2K$ | 79% |
| **Air Permeability:** | **20.1** $m^3/m^2.h$ | **13.8** $m^3/m^2.h$ | 30% |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# 4. How we work

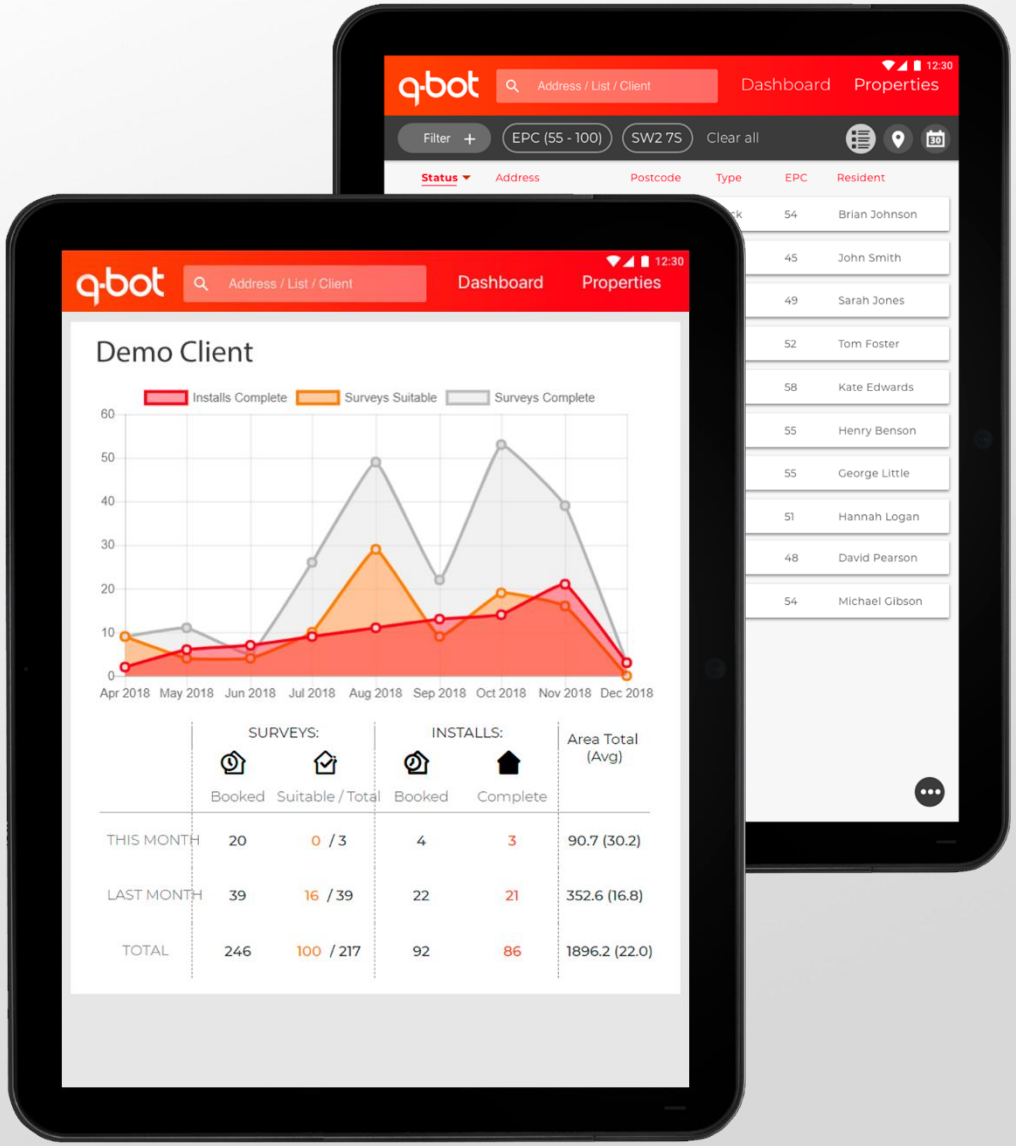
## Insulation of suspended timber floors with robots:

**Step 1: Stock assessment** – Your asset database is enriched with information from the national EPC register, Local Authority records and Google Street View.

**Step 2: Business case –** An assessment is made on the needs and priority of your stock, identifying properties to target, the likely impact and funding opportunities.

**Step 3: Stock condition surveys** – Detailed surveys create a comprehensive record of a building's condition and energy efficiency and check if it is eligible for insulation.

**Step 4: Insulation installation –** Q-Bot organises the installations with residents and measures the quality of the work done to ensure compliance.





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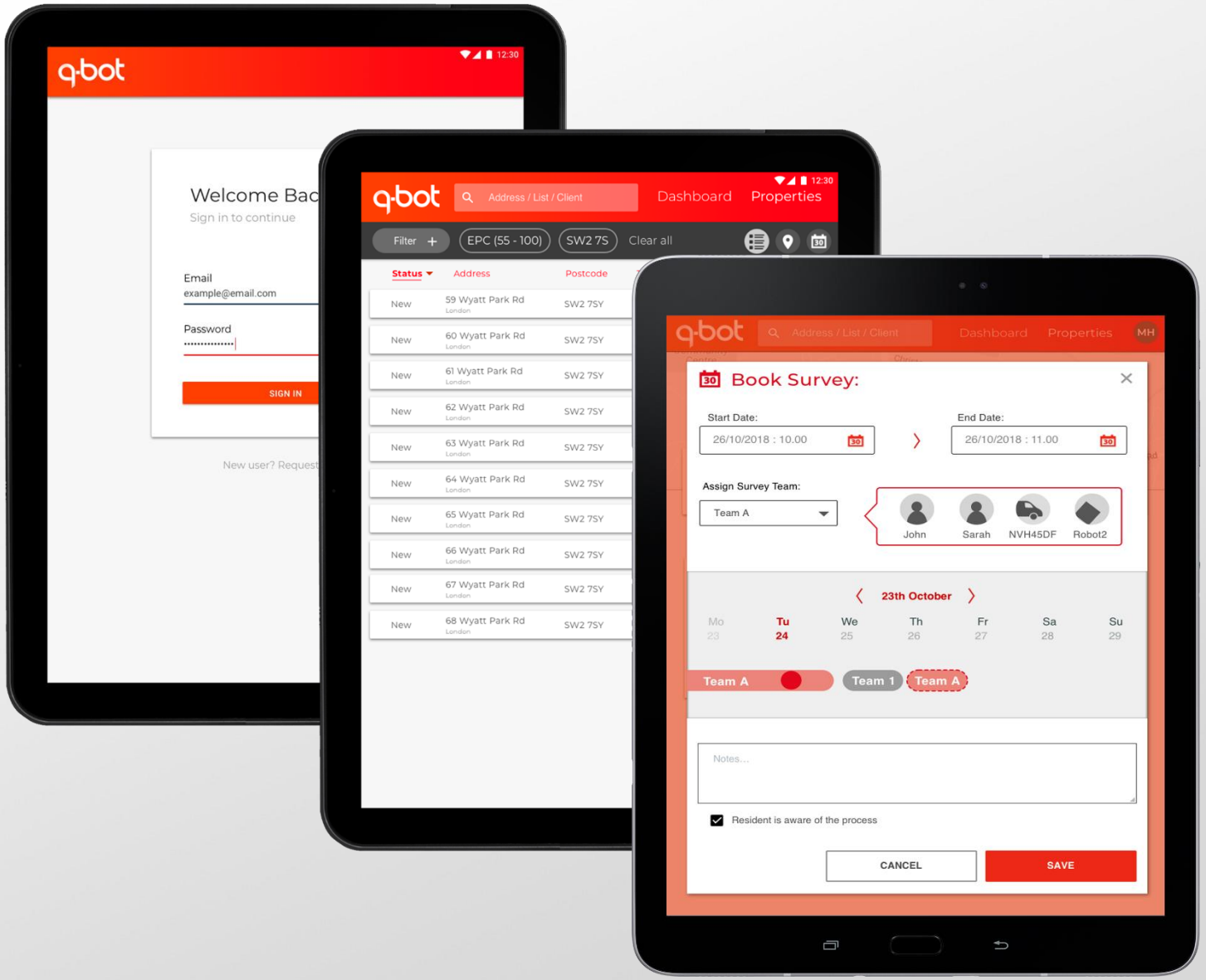
# 5. Management system

## Property management:

**Integrate with a property database:** The system integrates with asset management systems and a nationwide property registers to filter and prioritise work.

**Identify properties and plan work:** The app allows properties to be identified that need a stock condition survey.

**Book a survey or install:** Work is booked into the schedule can be linked to communication systems.





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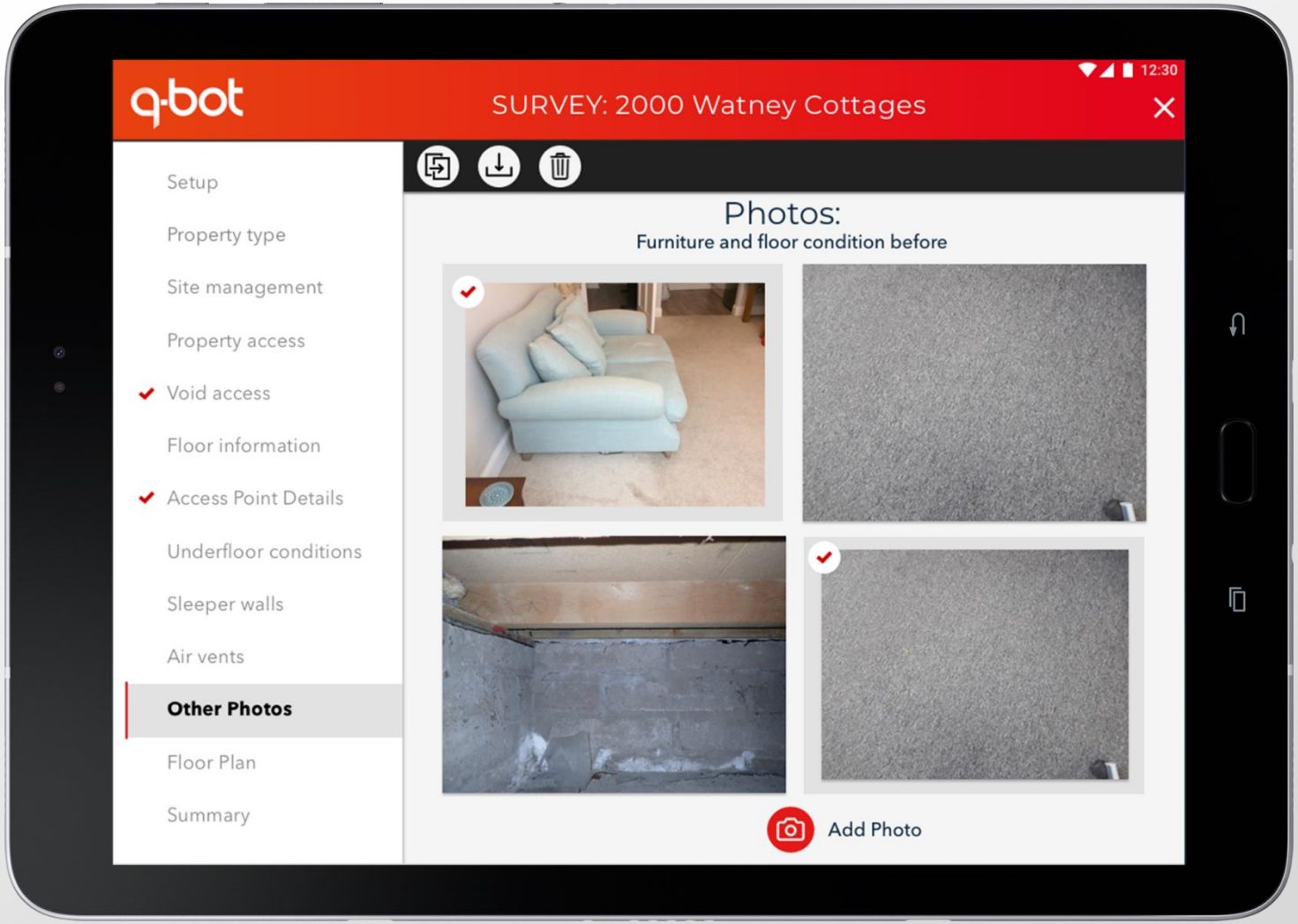
# 5. Management system

## Surveys:

**Survey form:** An easily customised survey form allows property specific information to be captured including photos and floorplans.

**Preparation of estimates:** The cost and impact of different options to maintain or upgrade the property can be calculated.





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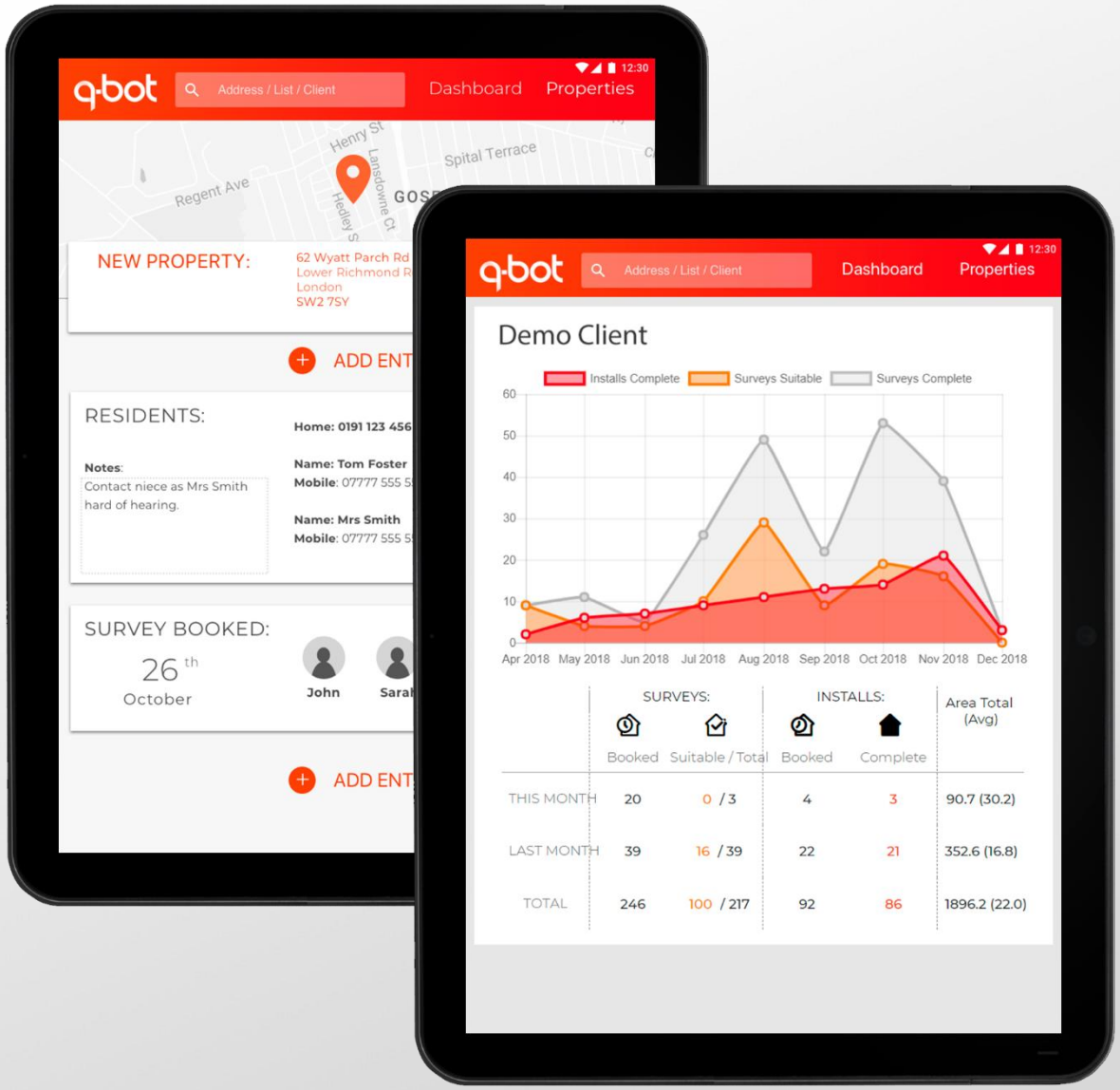
# 5. Management system

## Manage outputs:

**Compliance checks:** The installation can easily be checked by an independent team to ensure compliance.

**Performance Tracking:** KPIs for each installation team and customer can be reviewed to track progress.

**Integration with 3rd Party Systems:** Information can be exported and shared with third party systems.





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# 6. The 3D scanning system

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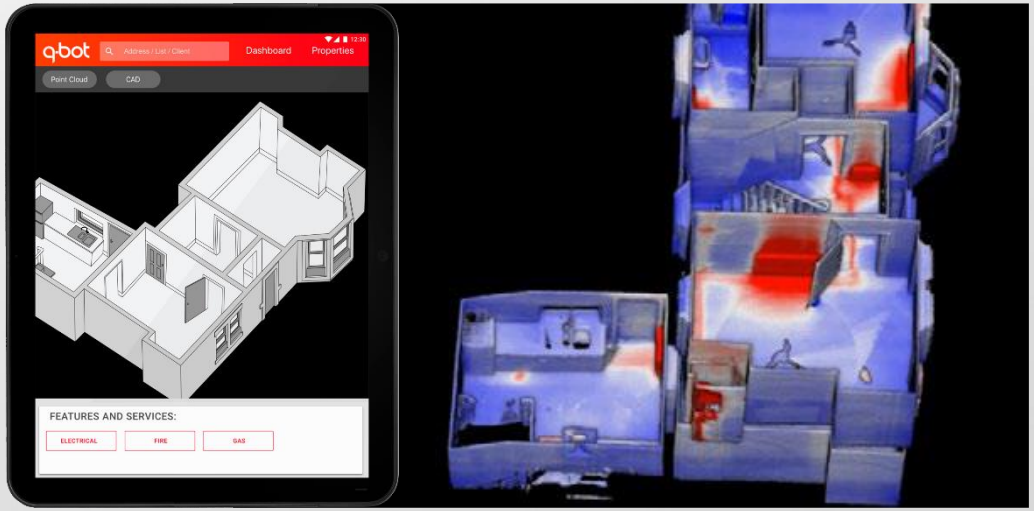
# 6. The 3D scanning system

## Stage 1 - Scan each room:

The scanner is placed in the middle of the room and linked to the tablet. A scan takes 60 seconds to collect a full 360 capture of the room.

## Stage 2 – Process data:

The raw data is converted into a simplified 3D model and AI is used to recognize elements of the room.





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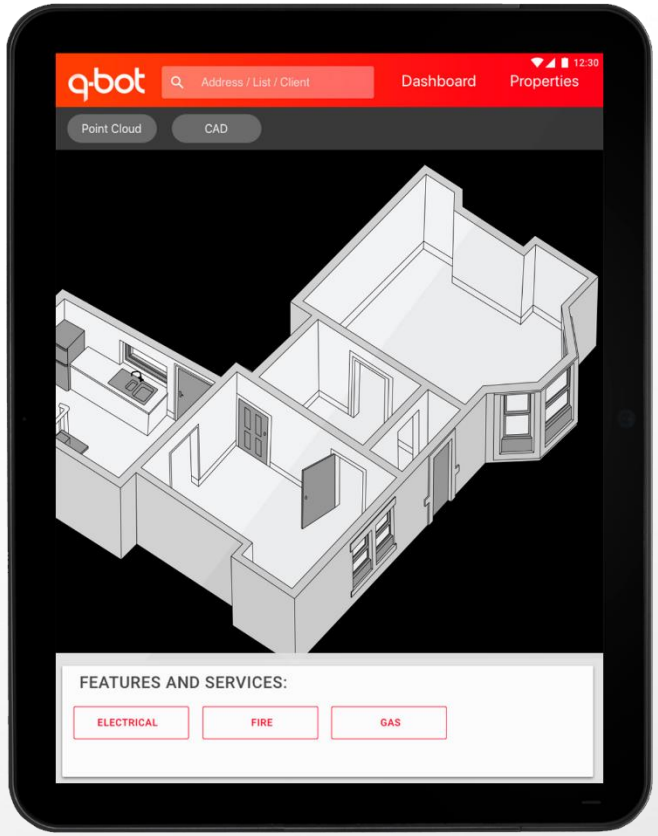
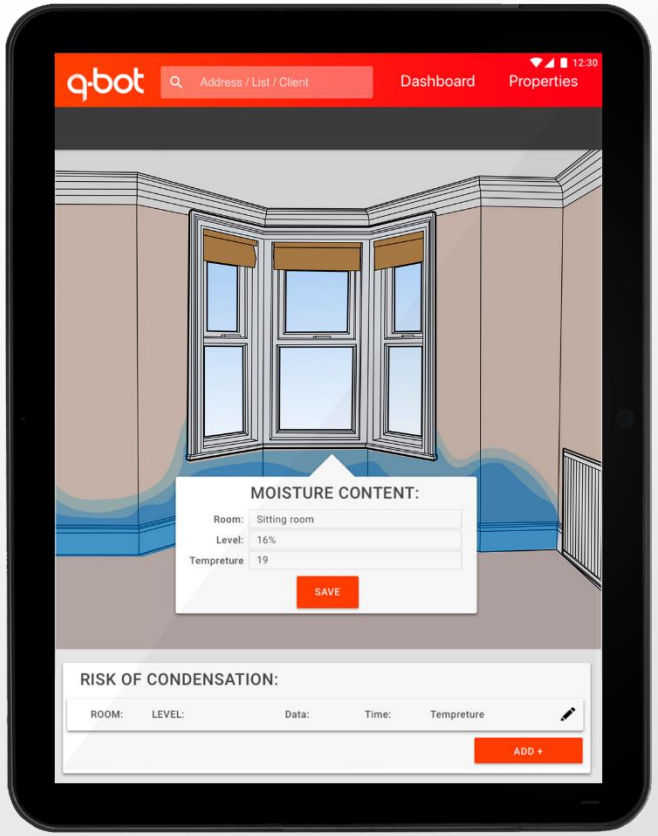
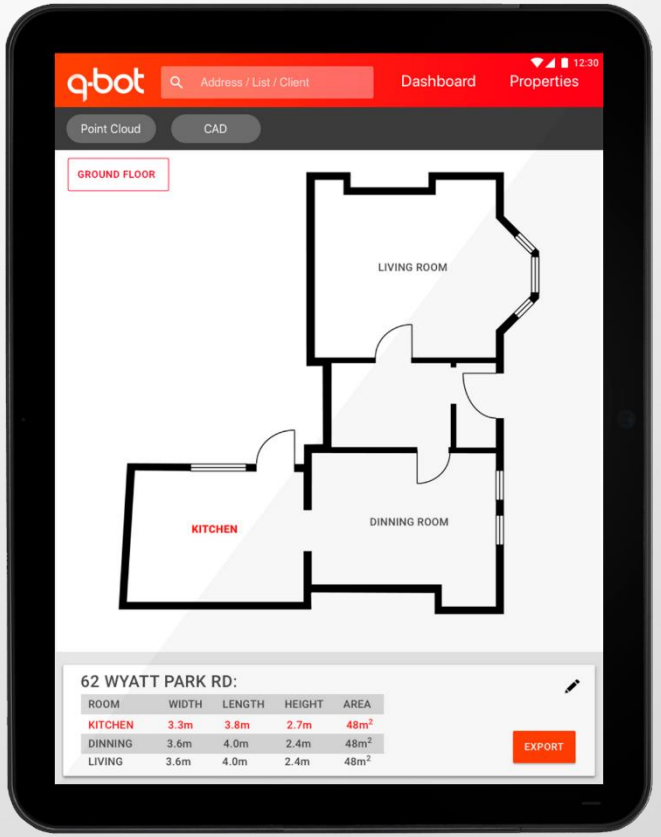
# 6. The 3D scanning system




## Stage 3 – Annotate

The surveyor can label elements and add further details using the app. Additional data can be overlaid such as the risk of condensation and information can be stored about services.

## Stage 4 – Create outputs:

Outputs include: a 2D floorplan and a simple 3D model; dimensions and areas of key building elements; and, detailed thermal and energy efficiency models.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