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IOT SOLUTIONS DESIGNED FOR THE HOUSING SECTOR

WHO ARE INVISIBLE SYSTEMS?

Invisible Systems is a proven, UK manufacturer of **LoRa** and **NB-IoT wireless devices**, with over 17 years of experience in delivering **leading IoT technology**.

We support the housing sector in **improving the management of properties through the remote monitoring** of**:**

- **temperature, humidity and CO2** - which can be used to model mould growth patterns
- **utilities** inclusive of electricity, water, gas and heat
- **water temperatures -** enabling the prevention of Legionella
- **occupancy**
- **window openings**
- **carbon monoxide**
- **VOC**

We continue to develop monitoring solutions based on the evolving needs of our clients.

Invisible Systems clients are provided with a secure software platform, **Real-Time Online**, which gathers data from your sensors and displays information within a personalised dashboard.

In addition, **Real-Time Online** offers a comprehensive reporting suite and notification system.

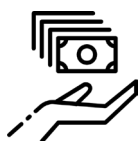**invisible systems**

WHY CHOOSE IOT?

Online, Personalised Software - Our online monitoring software, Realtime Online is set-up and designed to meet the specific needs of your organisation.

Proactive Alarms - Pro-active alerts ensure that your team have the ability to manage properties effectively and take preventative measures when needed.

Simple, Secure Set Up - Our wireless sensors are easy to set up and do not require any integration with your existing IT infrastructure.

Lower Costs - Choosing wireless sensors and a cloud platform enables you to reduce your installation and maintenance costs.

Low Maintenance - Our sensors have been designed to have a battery life of up to 10 years, so you don't have to worry about changing them frequently.

Improved Tenant Well-Being - Landlords not only have responsibility for their properties but for the people that call them home. Our solutions enable Landlords to put their Tenants well-being first.
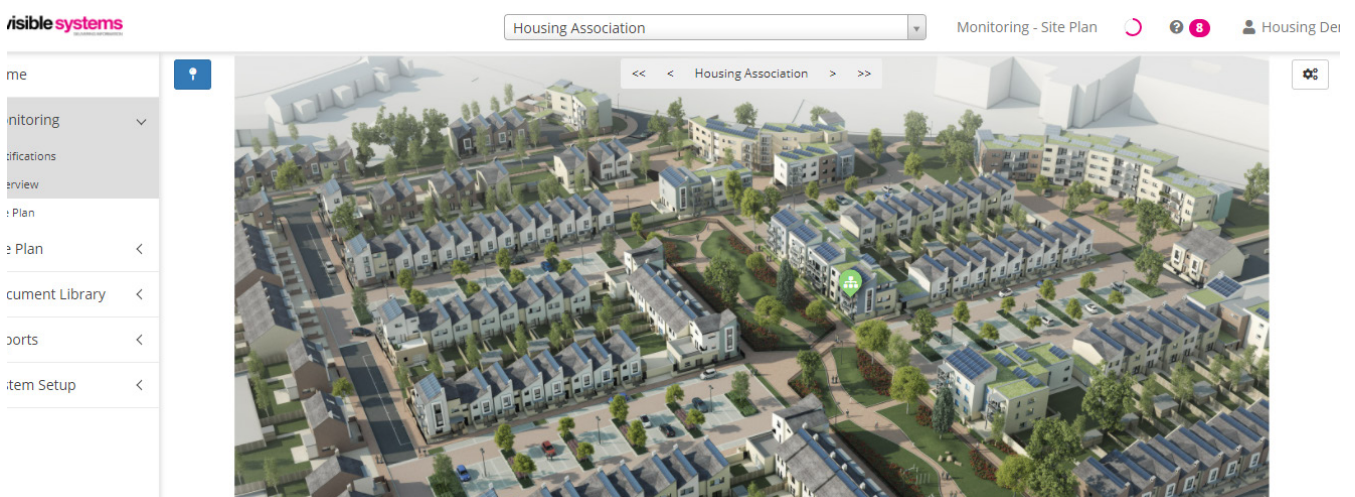
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REAL-TIME ONLINE

Clear, Actionable Data Delivered on Personalised Dashboards

Real-Time Online is Invisible Systems' **cloud-based software**, hosted in a **ISO27001** secure UK data centre and is accessible via a secure username and password from any internet connected devices/browsers therefore the system is available 24/7 regardless of site access.

Real-Time Online is set-up to **meet the specific needs of your organisation.** Whatever solution you choose to implement within your organisation, you'll be able to continuously monitor the conditions of the assets in **real-time** via our user-friendly dashboards.

ALERTS

Real-Time Online has the capability to set and adjust **high and low thresholds for each sensor**, which, when exceeded, creates and logs alarms. Not only is the **alarm alerted and logged within the system**, but specified users can be alerted via:

- **email,**
- **text**
- **or call** (autodialling alerts).

Alert settings are configurable and can be adjusted to compensate for any environmental changes within the building EG) day and night.
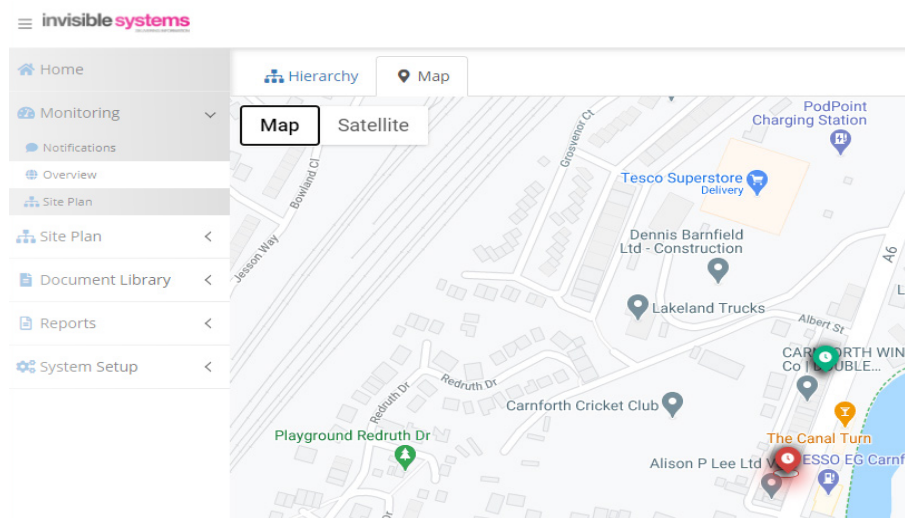
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Taking and Logging Corrective Actions

In the event of an alarm, users can access the dashboard to acknowledge the alarm and describe what action, if any, has been taken.

All the corrective actions are stored and logged for traceability and audit trail.

The audit trail includes:

- Sensor Name
- Location
- Actual reading
- Status
- Action
- Username
- Time & Date

Reporting

Real-Time Online provides users with **comprehensive reporting capabilities** which can be automated or produced manually.

Users can select any live devices to view a report, filterable by date, period, or month, to view historic data. Comparative reports can also be generated to compare conditions across different timeframes and locations.
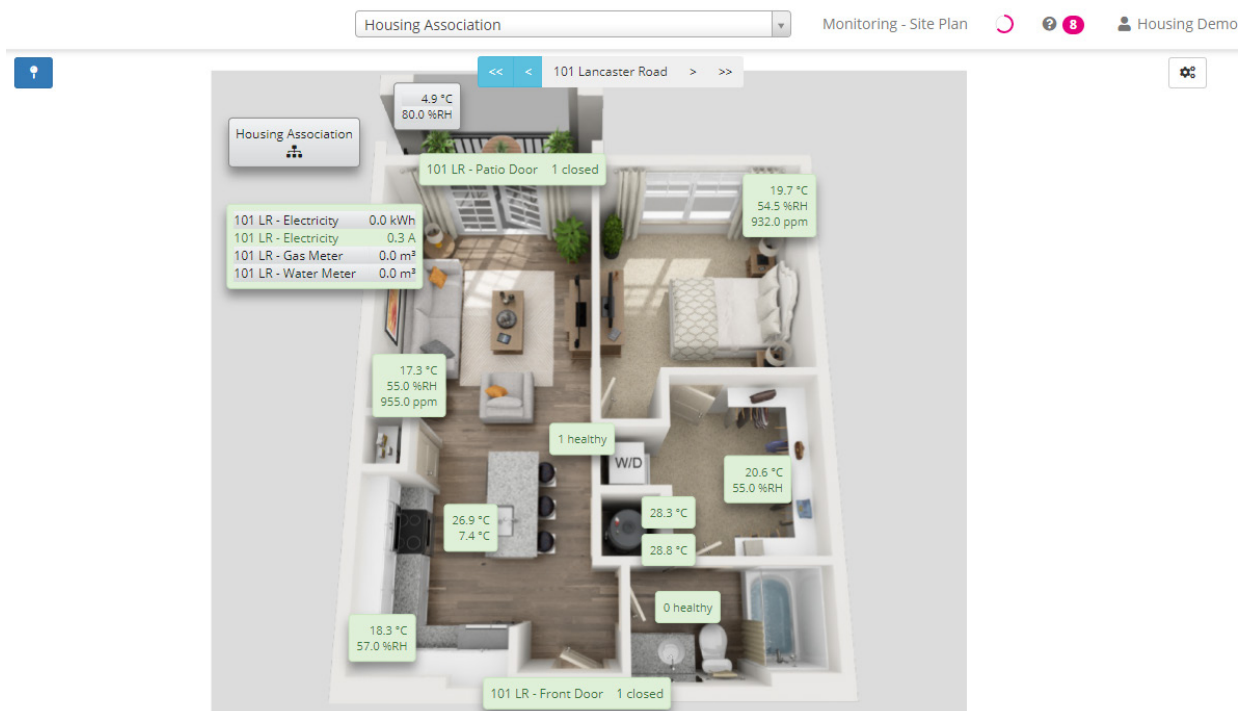
The reports generated by Real-Time Online can be used to satisfy a wide range of compliance standards relevant to the housing sector.

SIMPLE, SECURE SET-UP

Data security has never been more important. For organisations within the housing sector, inclusive of Housing Associations and landlords, the requirement for the highest level of security is even more crucial.

With this in mind, we developed our solution so that there is **no requirement for integration with your existing infrastructure**. You do not need to upload any software onto existing site computers and no cabling, wiring or IT resource is needed for configuration.

Our solution is totally independent of your local IT system, due to the gateway having a 'roaming' cellular connection to the server via a secure, VPN connection.

All data is encrypted at source and only decrypted on the secure Realtime Online server. Configuration changes can be done **remotely at any time** and logged in the system for traceability following a user secure login.

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LOWER YOUR COSTS

A reduction in costs can be realised in numerous different ways following the implementation of IoT solutions in the housing sector, such as:

- **A reduction in the requirement of maintenance due to mould, damp and condensation**
- **A reduction in the number of claims made by tenants in relation to mould, damp and condensation**
- **A reduction in unnecessary energy usage**
- **Fewer in-person visits required to individual properties**
- **Any potential issues can be foreseen and rectified to prevent potential long-term damage**

Invisible Systems' solutions are available as a Data as a Service offering, meaning no expensive initial capital expenditure outlay.

A LOW MAINTENANCE SOLUTION

Invisible Systems sensors have been deliberately designed to have a long battery life, in some cases of up to 10 years. This means that you do not have to worry about continually changing batteries.

We provide our clients with a comprehensive support and maintenance package where required. Our expert team are also available to answer any questions you may have throughout your contract with us.

Within the support and maintenance package you can expect:

- System training – inclusive of configuration changes and the use of reporting tools
- Regular updates
- 24/7, 365-day monitoring
- 99.997% Uptime reliability
- Access to the support team within office hours
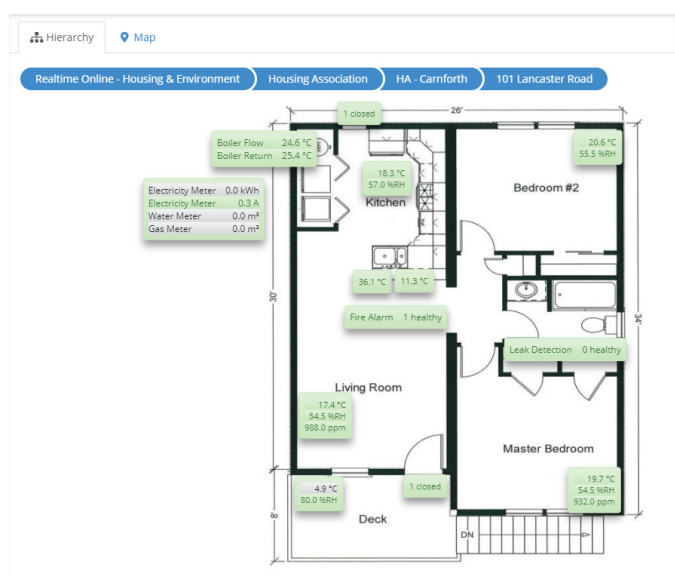
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HOW DO OUR SOLUTIONS WORK?

Our Internet of Things systems work slightly differently depending on whether a LoRa/LoRaWAN or NB-IoT solution is used. Our IoT experts will assess your requirements to help you select the best solution for your organisation.

LoRa and LoRaWAN

When using LoRa or LoRaWAN, your system will be made up of sensors and an internet gateway.

The Invisible Systems LoRa/internet gateway receives RF messages from the sensors and your data is then sent from the gateway to Real-Time Online, our cloud-based reporting software via a 2G/3G cellular modem.

NB-IoT

In the case of NB-IoT, a similar process takes place, but no gateway is required. Instead, the data is uploaded directly from the sensor to the server.

Edge Intelligence

Invisible Systems Internet of Things solution also incorporates Edge Intelligence. Edge Intelligence is an alert scheme which alerts predefined team members within your organisation to any breach of thresholds via SMS or Text-Speech, or email.

This use of Edge Intelligence ensures instantaneous alerts and ensures the effectiveness of IoT within medical organisations.

OUR SOLUTIONS IN PRACTICE

The following case study explains how Invisible Systems' IoT sensors are being used by Smartline, a project led by the University of Exeter, to improve the quality of life for tenants in a Housing Association in Cornwall.

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MODELLING AND PREVENTING MOULD GROWTH

USING IOT TO IMPROVE THE HEALTH AND WELL-BEING ON TENANTS IN CORNWALL

PROJECT SNAPSHOT

Smartline is a collaborative research project exploring the relationships between people, technology and wellbeing leading to new products, processes and services in smart housing and smart communities.
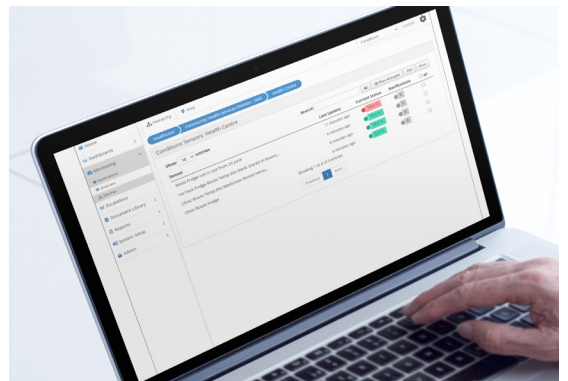
The project aims to provide data about the people living in Cornwall to enable data-driven decisions to be made on policy by Cornwall Council.

One of the programmes within the project, led by Dr Tamaryn Menneer, is focused on modelling mould growth using relative humidity and temperature time-series data within the properties of a Housing Association.

Mould is recognized to have an adverse effect on health, causing and exasperating respiratory illnesses such as asthma. Despite this, it's estimated that approximately 75% of all claims made by tenants to Housing Associations are focused on mould and the environmental conditions that lead to it.

Using the VTT model which predicts mould growth from relative humidity (RH) and temperature, and Invisible Systems temperature and humidity sensors, a study is in place to model and prevent mould in 274 homes in the Cornwall region.

PROJECT OUTCOMES

To date, the study has identified that smart monitoring using Invisible Systems IoT sensors, has the ability to alleviate costs of repair associated with mould. The monitoring has also enabled them to prevent related conditions such as cold and damp within homes.

The use of modelling enables early targeted interventions to improve public health and living environments.

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By taking the modelling into consideration and providing the minimum targeted intervention necessary to minimum mould growth, the Housing Association have been able to:

- Reduce impact on the health of tenants
- Avoid unintended consequences in homes with reduced ventilation (eg energy efficient homes)
- Maintain human comfort
- Avoid unnecessary expenditure on energy
- Reduce claim costs

"Smartline is providing the hard data about people in Cornwall that is critical to allow us to make policy decisions for Cornwall."

- Rob Rotchell, Cabinet Member for Adult Social Care, Cornwall Council.

ANY QUESTIONS?

If you have any questions regarding our solutions, or would like an in-depth consultation focused on your organisation, please contact a member of our team who will be happy to help.

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