

**LinkThru**  
MONITORING TECHNOLOGY

## LinkThru TMU Temperature Monitoring Unit



# LinkThru TMU



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# Reduce The Risk

LinkThru TMU harnesses the power of the Internet of Things to monitor water temperatures and help to ensure Building Owner compliance with HSG274, reducing the risk of Legionella.

The latest innovation from Cistermiser, LinkThru TMU delivers remote real-time monitoring of water temperatures on a 24/7 basis.

Using Sigfox (IoT) radio network, without reliance on wi-fi or existing LAN infrastructure, LinkThru TMU is the best way to ensure compliance with legislation and accurately monitor water temperatures throughout a building, protecting visitors and staff alike from the risk of Legionnaire's disease.

**BBC**

**NEWS**

## **Bupa fined £3m in Legionnaire's disease care home death**

14 June 2018

## **Hospital fined £300k after Legionnaires' disease death**

20 April 2018

## **Legionella found again at Ludlow's The Feathers Hotel**

12 May 2018

## **Boldon Legionnaires' outbreak firm Faltec Europe fined £1.6m**

17 May 2018

A number of prominent UK businesses and public sector organisations have been prosecuted and heavily fined for failing to comply with Health and Safety at Work etc Act 1974 (HSWA) legislative requirements in recent years.

**Shropshire Star**

**News**

## **Part of Ludlow's Feathers Hotel closed as Legionella bacteria found again**

12 May 2018



**Health and Safety  
Executive**

## **Double-investigation leads to fine for North East car parts manufacturer Faltec Europe Limited**

17 May 2018

LinkThru TMU is designed to help reduce Legionella risk and deliver peace of mind, best practice and demonstrable management of health, safety and welfare.

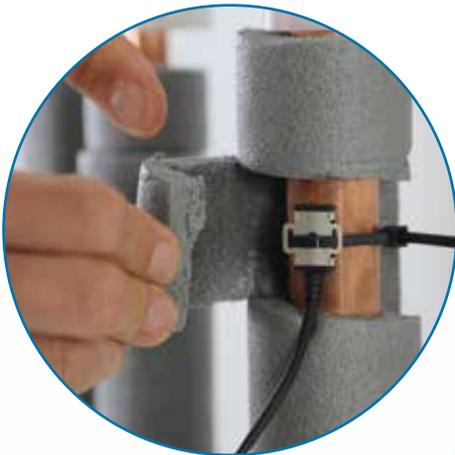
# How It Works

LinkThru TMU enables cost-effective real-time data capture, analysis, reporting, alarms, notifications and auditing as part of a Legionella control regime using Temperature Monitoring Units (TMUs) placed at sentinel points.

LinkThru TMUs are small black boxes that simply and easily affix to water pipes anywhere in the water system using small clamps, eliminating the need for a person to take temperature monitoring recordings themselves.

TMU devices take precise temperature readings every 10 seconds, transmitting the data into a 'cloud' database that users can access at any time by logging on to a secure dashboard portal.

Users will only receive a notification from the system if it detects a discrepancy in water temperature or flow event which is beyond pre-defined limits.



TMUs take temperature samples every 10 seconds (for hot, cold or blended supplies) and automatically begin recording additional data when outlet usage is detected.

Each TMU accepts up to 4 temperature probes (configured as 2 pairs) which simply affix to pipe work surfaces using clips (15mm) or cable-ties (>15mm).

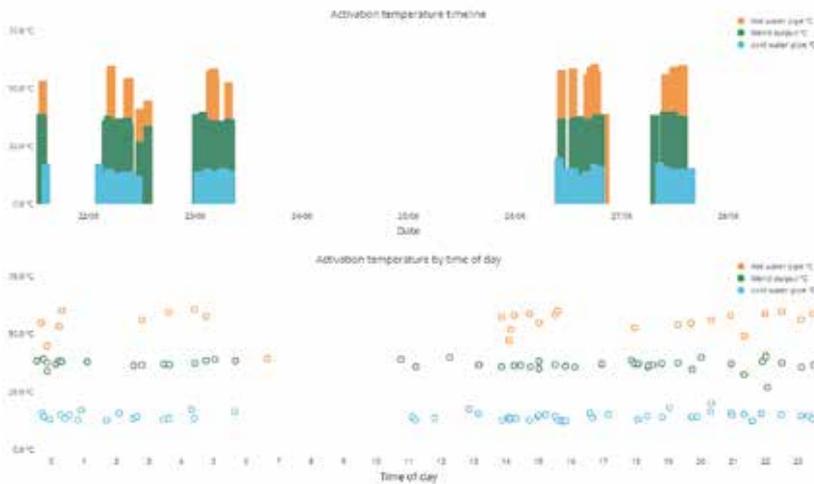


TMU devices are battery-powered with a long life of between 3 and 5 years, depending on the data mode.



This example dashboard screen shows monitoring of hot and cold temperatures over a two-day period.

The LinkThru portal provides an overview of hot and cold water pipe temperature ranges and flow events over defined periods of time.



Activation temperature timelines from sensor readings can be easily inspected, to analyse patterns of usage in precise detail.

## Constant Temperature Monitoring

LinkThru TMUs can be fixed in position or moved to provide temperature comparisons, which enable identification of “dead legs” in pipework for example, as part of the Risk Assessment. These devices can be used to monitor outlets, TMVs, incoming mains temperature, cold water storage, calorifiers and other parts of the water system.

Having constant, real-time data allows you to be much more proactive in your management of Legionella risk.

With TMUs positioned as required at key points around your building, LinkThru:

- Delivers real-time data that alerts you to outlets that are at risk and should be investigated
- Sends automatic notifications to alert staff and help implement proactive risk management
- Provides a complete on-line history and audit record of all data and associated actions
- Ensures accurate and constant data capture to give a continual overview of system behaviour, compared to manual once-a-month readings
- Detects which outlets need to be flushed for at least 2 minutes as part of a control regime and (perhaps more importantly) those that don't - therefore saving water
- Identifies other risks, such as detecting temperatures that exceed safety threshold limits and pose a risk of scalding or a risk of freezing pipes
- Reports on outlet usage, detecting outlets that are under-used or locations where outlets have been left running continuously
- Integrates directly into Building Management Systems such as Maximo, if required, as well as other enterprise applications, e.g. SAP

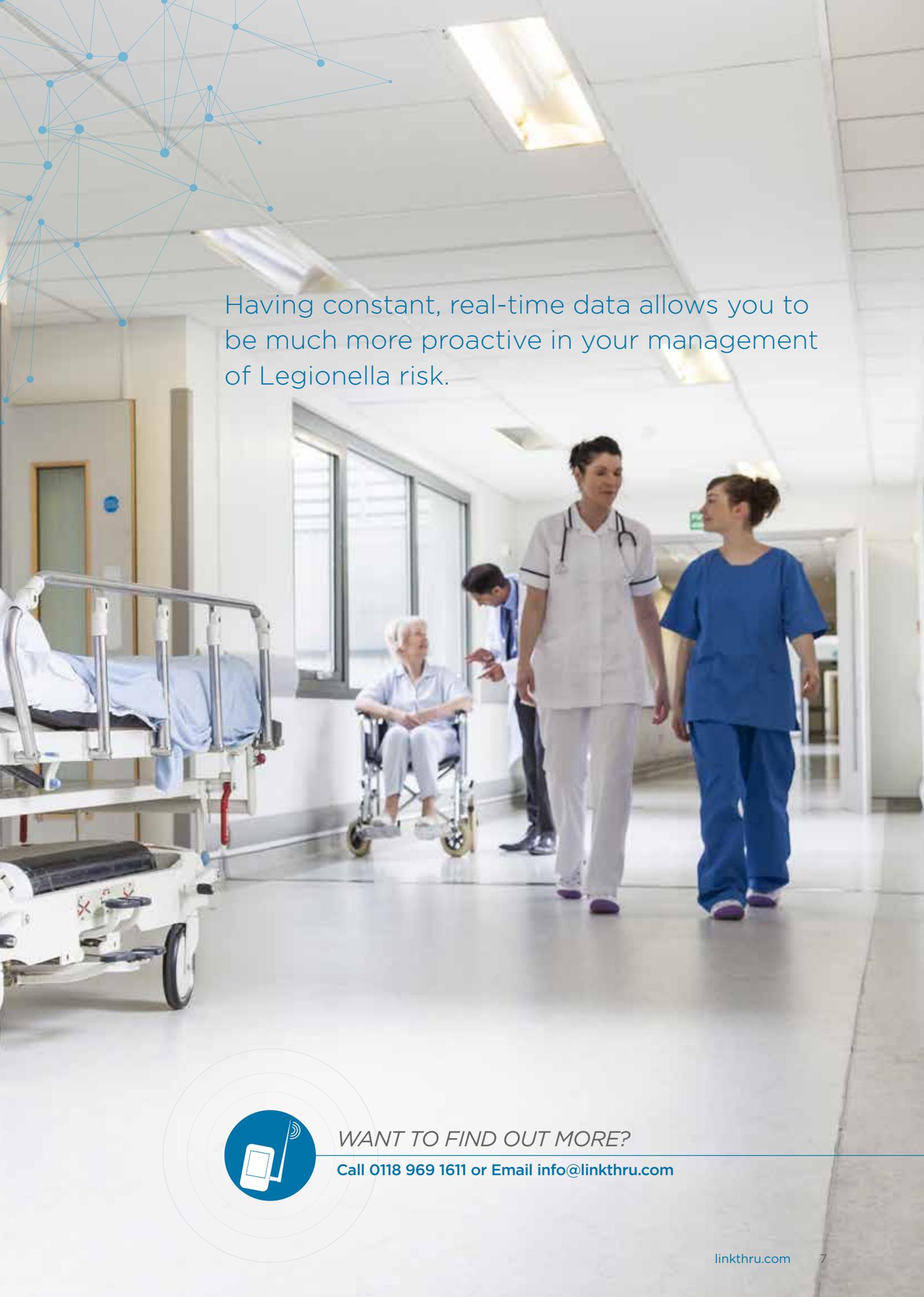


Search [#LinkThru](#) and see a demo





Having constant, real-time data allows you to be much more proactive in your management of Legionella risk.



*WANT TO FIND OUT MORE?*

Call 0118 969 1611 or Email [info@linkthru.com](mailto:info@linkthru.com)

## Efficiency Through Technology

Approved Code of Practice and Guidance L8 (fourth edition), published by the Health & Safety Executive (HSE) in 2013 with technical guidance published separately in HSG274, seeks to reduce risk in a practical manner. Adoption of the right technology now allows us to be better at what we do – securing truly insightful information means we can improve water safety and reduce risk of Legionella at all times.

Our objectives are precisely defined. Through technology advancement we can improve risk mitigation and reduce costs.

Developed in conjunction with Spica Technologies, LinkThru TMU is not simply “tech for tech’s sake”, but tech specifically designed to improve process and deliver a tangible business outcome.



The LinkThru temperature monitoring system is running in many estates, including several Healthcare sites in addition to other Public Sector and Commercial premises. Developed through extensive collaboration with

Spica Technologies and the involvement of key maintenance and engineering personnel, the platform is powered by Spica Devicepoint® and ensures adherence to HSE technical guidance and approved codes of practice.



Our new web-based software platform, in conjunction with Temperature Monitoring Units, eliminates the need for costly and potentially inaccurate manual measurement tasks, providing a vastly superior picture of likely risks, whilst meeting and exceeding regulatory requirements. LinkThru TMU also records “actual” water system flow event data to provide reliable outlet usage insights and inform risk management.

*David Meacock, Technical Director, Cisterniser*

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A man with a beard, wearing a grey suit jacket, a light blue shirt, and a dark tie, is looking down at a tablet computer he is holding. He is standing in a bright, modern office environment with large windows in the background. In the top right corner, there is a decorative graphic of a network or data structure, consisting of blue dots connected by thin lines.

Our objectives are precisely defined.  
Through technology advancement we can  
improve risk mitigation and reduce costs.



# An Ideal Solution

Building Owners, Facilities Managers or Maintenance professionals need to mitigate and thoroughly deal with the risks associated with Legionella bacteria. The ideal solution must:



Address legislative requirements



Be simple to fit, use and monitor



Provide accurate data and a complete audit trail



Identify potential issues and immediately flag alerts



Remove reliance on manual readings and associated human errors



Be cost-effective



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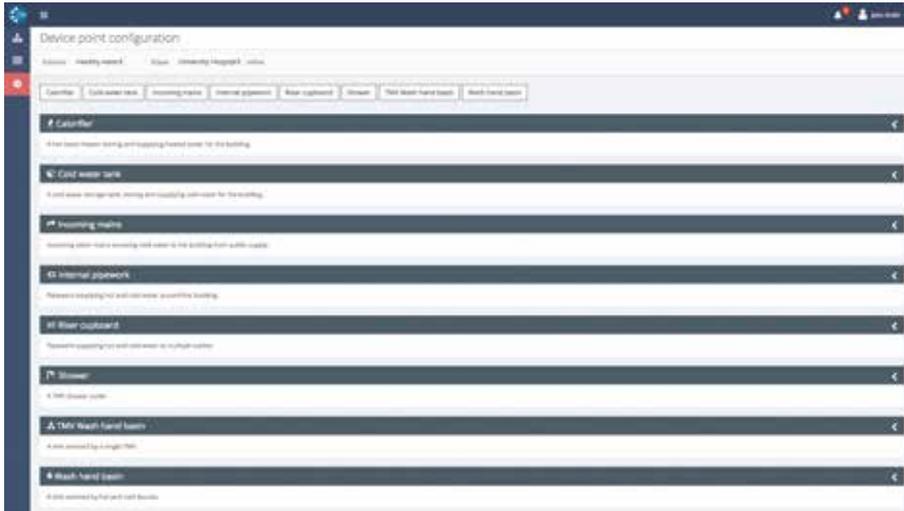


# Meeting Your Business Needs

From hospitals to commercial offices, the needs of a particular business premises will vary and hurdles to implementing new monitoring technology may seem daunting.

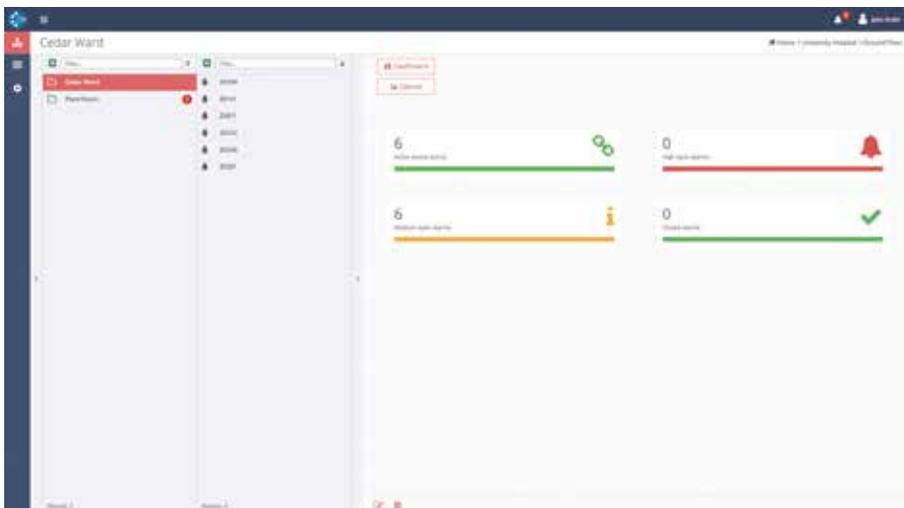
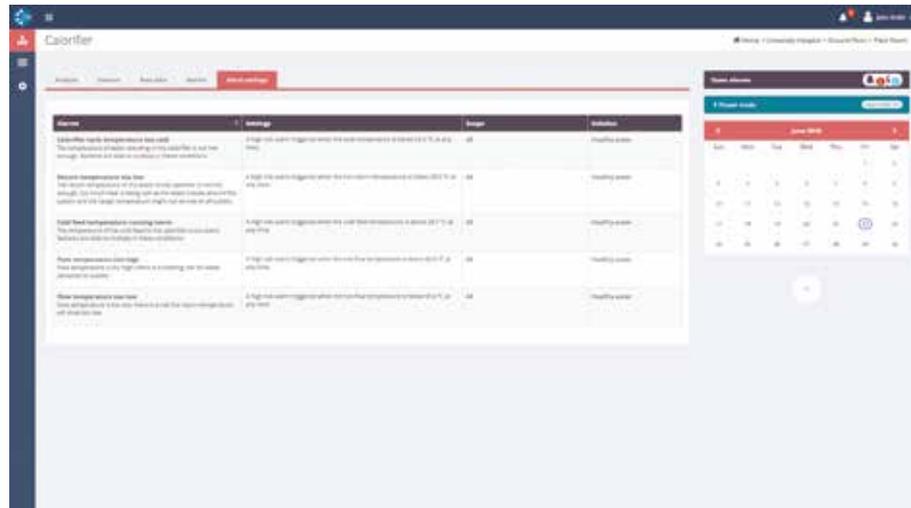
## LinkThru TMU addresses many common concerns:

- **Unreliable data** – Periodic temperature readings recorded manually do not show trends or outlet usage  
*With LinkThru TMU: Continuously recorded water temperature and flow data can be analysed for trends with pre-defined profiles*
- **Access to outlets** – The temperature monitoring and recording process must not create an infection path  
*With LinkThru TMU: Remote monitoring means that there will no longer be a need for inspectors to enter high-risk wards or access remote locations*
- **Network integration** – Local networks are business-critical infrastructures and can have many gatekeepers (e.g. IT/ Security/FM/Client/Building Owner)  
*With LinkThru TMU: The growth of Machine-to-Machine communication has led to low-cost data networks with no reliance on local networks*
- **Hardware and data costs** – To cater for businesses large and small, solutions must be scalable  
*With LinkThru TMU: Individual nodes run on a low bandwidth, low-cost Sigfox network, with no local 'gateway'*
- **System integration** – For large business premises, technology solutions may need to integrate with the existing BMS  
*With LinkThru TMU: The water temperature and flow monitoring system can be completely stand-alone, however it is still possible to integrate into existing BMS and workforce management tools*
- **Changing plumbing system** – Buildings expand and design and usage of the water system, together with associated areas of risk, may change radically over time  
*With LinkThru TMU: The retrofit clamp-on Temperature Monitoring Units are easily moved, non-invasive, no skilled trades are required and water system outlet usage profiles can be pre-defined (e.g. TMV, flow & return, calorifier, etc)*
- **Managing data** – The legislative need to monitor and record temperature readings in volume is an overwhelming burden and it can be difficult to prioritise staff resources and maintain accurate records  
*With LinkThru TMU: Notifications are only raised by exception (e.g. an alarm event) and a full data log is provided at all times, with an easy-to-use reporting function*

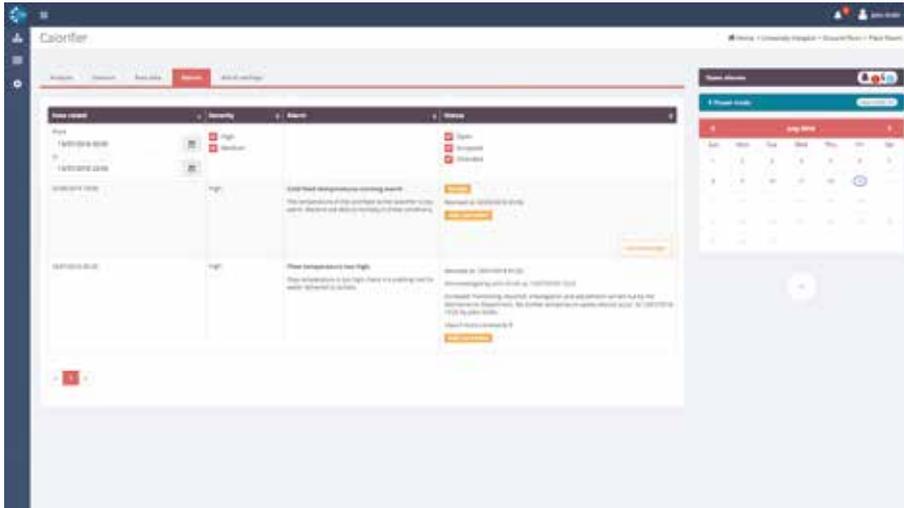


**1** LinkThru TMU can monitor the full range of water system devices, from incoming mains water supplies to specific points of use.

**2** Water system devices configured within your building hierarchy can be assigned precise alarm parameters (note: default settings are based on HSE guidelines).



**3** A user-friendly RAG dashboard provides a real-time management overview of devices in use - in this example, 6 active device points (green) have flagged “medium” alarms (amber) for information only, but no “high” alarms (red) have been triggered that would require investigation.

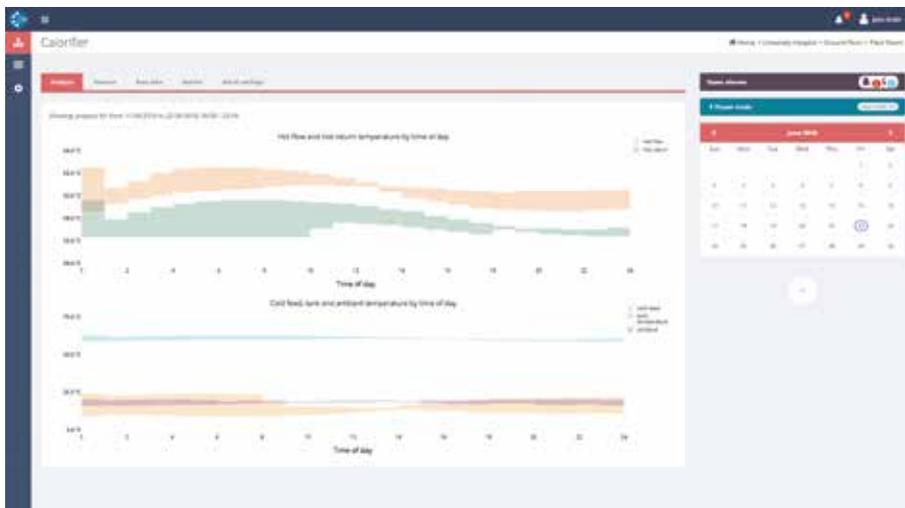


**4**

When alarms are triggered, notifications can be sent by email or SMS and the dashboard provides detailed information and a convenient interface for resolving each alarm with documented actions and comments, to create an audit trail.

**5**

This example of analysis by selected device point shows incoming mains water and ambient temperatures plotted across 24-hours, over a 6-day period.



**6**

Detailed insights can be accessed to evaluate the performance of devices - here, calorifier hot flow and hot return temperatures are shown by time of day, together with cold feed, tank and ambient temperatures.

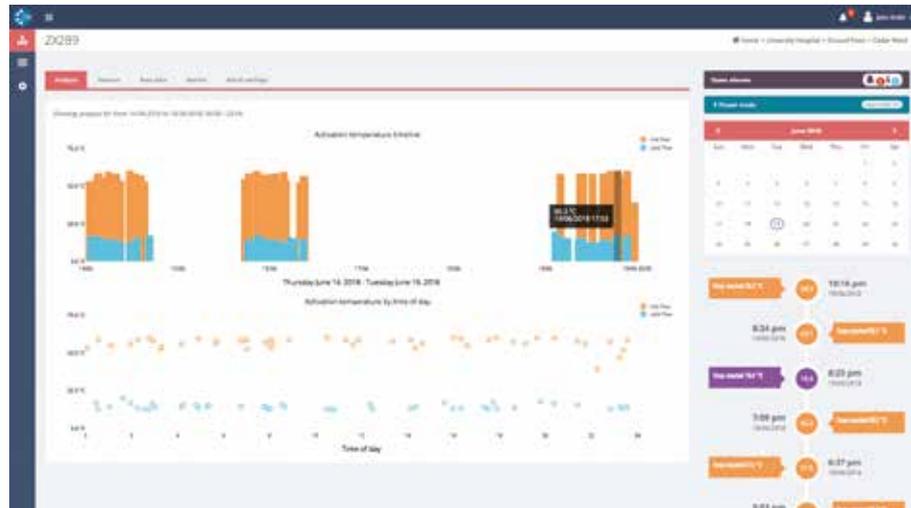


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For easy monitoring of calorifier performance, a circular graphic highlights the average drop in hot return temperature (compared to hot flow).

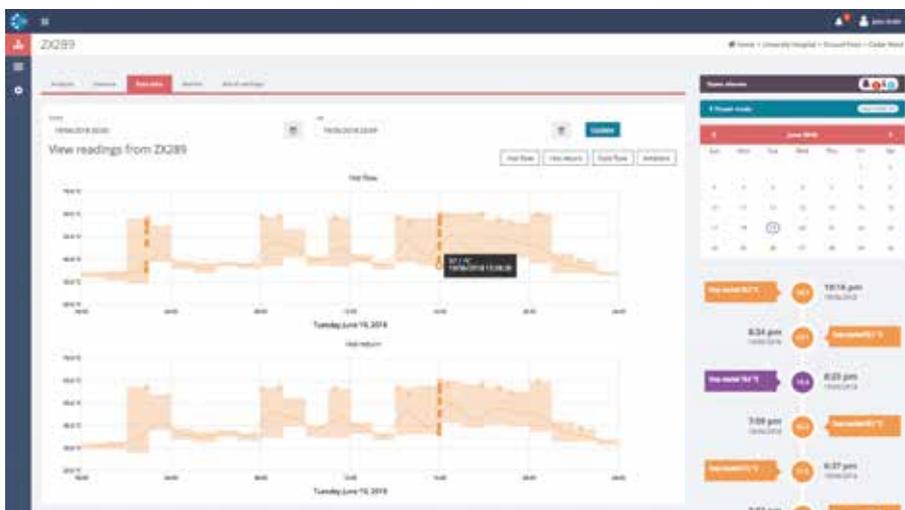
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Device activation temperatures can be viewed with summaries of each selected week and time of day – each bar represents a single flow event and you can hover over the chart to view the time stamp and peak temperature reached. This screen also includes a chronological timeline of all detected flow events.



9

LinkThru TMUs take 360 measurements per hour and the raw data is readily available to provide detailed analysis of temperature profiles and flow events – the user simply clicks on the dots to view data in detail.



# LinkThru TMU Specifications

## Analog Inputs

**Inputs:** 2 x 2-way NTC Thermistors

**Measurement range:** -5°C to +90°C

**Accuracy:** +/-1°C

**Readings frequency:** Every 10 seconds

## Power

**Battery:** 3.6V 8500mAh Li-Metal, non-rechargeable, not field replaceable

**Lifetime:** 3 to 5 years, dependent on operating mode

## Radio

**Frequency:** Sigfox - 868Mhz (unlicensed spectrum)

**Protocol:** Sigfox (see <http://makers.sigfox.com>)

**Output power:** 14dBm

**Antenna:** External omni-directional antenna

## Environmental Requirements

**Operating temperature:** -30°C to +60°C

**Storage temperature:** -50°C to +85°C

## Enclosure

**Ingress protection:** IP55

**Dimensions:** 99mm x 60mm x 37.5mm

**Security:** Tamper proof screws, tamper label (void if removed)



TMU devices use the Sigfox network to transmit temperature profile information to the LinkThru software platform. There is no requirement to integrate or interfere with any on-site/local IT or networking systems.

The low power required to send messages via Sigfox optimises TMU battery life. Security of TMU wireless communications is ensured through an array of features, including anti-replay, message scrambling and message sequencing.



WND-UK, the UK's Sigfox network operator, are deploying Britain's first dedicated Internet of Things (IoT) network with roll-out scheduled to provide 95% signal coverage of the UK population.

# LinkThru TMU

## Advantages 'At-A-Glance'

LinkThru TMU is designed to meet the practical temperature monitoring needs of Facilities Management and Maintenance professionals, whilst at the same time providing unbeatable cost-in-use benefits to satisfy Finance requirements.



### LinkThru TMU's advantages include:



Standalone infrastructure (not reliant on local network), so there's no disruption to existing business systems



Low-cost data (via Sigfox network), so inexpensive to install and run



Simple to install on pipework, so an ideal retrofit solution



Delivers trend analysis and sends alarm reports only by exception, so users are not bombarded with unnecessary data



Built for HSE legislation compliance however the data is powerful, so additional benefits include measurement of calorifier efficiency, identification of heat loss and lagging

requirements, clarification of water system usage patterns (i.e. most-used washroom facilities) which in turn can fine-tune resource management (e.g. cleaner work-cycle patterns)

# Purchasing LinkThru TMU

LinkThru Temperature Monitoring Units (TMUs) are available to purchase directly from Cistermiser Ltd.

In addition to TMU hardware, provision of secure cloud-based 24/7 data services is also available to purchase from Cistermiser on a monthly subscription basis.



For sales assistance, please contact our Customer Service team on 0118 969 1611, or alternatively email your enquiry to this address: [info@linkthru.com](mailto:info@linkthru.com)

Our National Sales team is also available to provide the highest levels of technical advice and specification support at local level.

## Advances in Water Technology White Paper

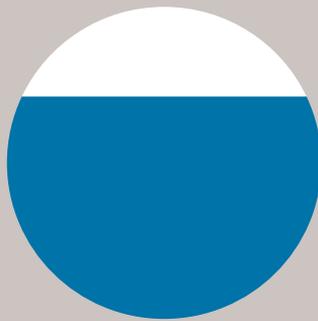
For Building Owners, Facilities Managers and Maintenance specifiers who need to comply with HSG274 (and NHS Estates policy management and control requirements) and mitigate the risk of Legionella, our sponsored Special Report white

This white paper can be viewed or downloaded at:

[ourworldiswater.co.uk/downloads](http://ourworldiswater.co.uk/downloads)

paper entitled “Advances in Water Temperature Monitoring Technology” provides full technical details on the advantages of our innovative LinkThru TMU remote monitoring solution..





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