

# METERING. MONITORING. MINI BMS. CONTROLS.

energy management made easy

[www.t-mac.co.uk](http://www.t-mac.co.uk)

**t-mac**  
technologies

# reduce energy. cost. carbon.

introducing t-mac and the technology



t-mac energy management solutions help businesses to remotely manage and reduce energy consumption and costs across a multi-site portfolio.

Once installed onsite, a t-mac system gathers real-time metering data from multi-utilities, as well as sub-meters, for activity areas such as lighting, heating and air conditioning. By connecting sensors, such as temperature, pressure and lux, the t-mac system monitors environmental conditions, instantly visualising energy consumption per site.

What makes t-mac different is its ability to take energy management further; by adding control. t-mac expands into a building management system (BMS) for remote control of equipment performance and use. With control mechanisms in place, t-mac helps businesses reduce consumption by ensuring energy intensive equipment is only being used when required; and devices (e.g. air conditioning and heating) are not being used simultaneously.

Finally, data is transmitted off site from each t-mac unit via wireless GPRS or Ethernet to a central server. Users log on to the t-mac online software suite via the internet to view, analyse, identify, compare and report on energy management activities, as well as view, implement and amend control strategies.

#### Overview

- Online software
- Unlimited user access
- Meter, monitor and control
- Wired or wireless



# t-mac technology

New for 2020 is the t-mac G3 suite of hardware solutions. G3 is our next generation of t-mac technology.



FEATURES	MINI t-mac	MAXI t-mac
Configurable inputs	4	12
Switched power outputs	4	12
0-10V outputs	-	4
Ethernet (10BASE-T)	✓	✓
GPRS modem	✓	✓
LCD	✓	✓
RS-485 ports	1	2
USB ports	2	2
Cellular Modem *	✓	✓
WiFi *	✓	✓
Z-Wave *	✓	✓
* via USB dongle		
ENCLOSURE		
Type	DIN rail	DIN rail
Material	Powder coated steel and plastic (Noryl)	
Dimensions (mm)	105x87x42	210x87x42
WALL-MOUNTED ENCLOSURE OPTION		
Width	350 mm	350 mm
Height	400 mm	400 mm
Depth	80 mm	80 mm
Weight	5.3 KG	5.3 KG
Material	Powder coated steel	Powder coated steel

# G3



- AMR**
- Real-time mains metering**
- Sub-metering**
- Tenant billing**
- Renewable monitoring**
- Machine diagnostics**
- Controls/BMS**
- Remote equipment maintenance**
- Education and showcasing**
- Legislation compliance**
- OEM solutions**

# t-mac applications

# metering

HEATING, LIGHTING, AIR CONDITIONING, REFRIGERATION, COMPRESSORS, RENEWABLES, DATA CENTRES, CANTEENS, SPORTS HALLS, OFFICE BLOCKS.

## MAINS METERING

Connecting t-mac to the mains multi-utility meters delivers real-time energy data. Visibility is key to energy management as without metering, businesses cannot know what they are consuming and when. By managing the data in real-time, businesses can act 'now' if energy consumption peaks beyond the desired level. The t-mac device can connect to the optical port or take a physical pulse output from the mains meter providing instant information on costs, consumption and carbon footprint.

canteens, data-centres, tenanted floors, manufacturing lines and sports halls, businesses can identify the cause of the mains consumption - the reasons behind the peaks, troughs and base-load. From sub-metering data, inefficiencies are easily identified and businesses are better armed to take action to reduce consumption, cost and carbon footprint.

## SUB-METERING

Once businesses know how much they are consuming and when, the next stage is to find out where and why. This is where sub-metering comes in. By sub-metering activity areas such as lighting, heating and general power or zones such as

## RENEWABLES

For an organisation investing in renewable equipment, metering of the energy generated is a valuable addition to the energy management activities. By connecting metering points from the renewable equipment to the t-mac device, businesses can quantify and verify energy generated.



# monitoring

## energy & environmental

TEMPERATURE, PRESSURE, LIGHT-LEVELS, HUMIDITY, WIND SPEED, WIND DIRECTION.

## people

FOOTFALL, TIME AND ATTENDANCE, DOORS, WINDOWS, OCCUPANCY.

## machinery

REMOTE DIAGNOSTICS, ON/OFF, SPEED, DIRECTION, FAULT CODES.

Environmental monitoring is a good addition to any energy management strategy. By attaching sensors (wired and/or wireless) to the t-mac device, businesses can get a better understanding of the environmental conditions within their building and, by monitoring equipment performance, how equipment within the building is operating.

Monitoring internal and external temperature can provide an indication of whether cooling or heating is required, or whether it is running too hot/cold for the building. Monitoring lux levels can

provide information on whether there is adequate natural light. Monitoring machine conditions can provide remote diagnostics of equipment performance - how and when it is running.

Environmental and machine monitoring tells a story as to how the building is operating and whether it is being used efficiently; it shows where inefficiencies lie, and also illustrates how to improve performance and therefore implement controls - local controls, people controls and/or BMS controls.



By working with t-mac we were able to identify

that our immediate solution was to scrutinise

**the use of in-store equipment to**

**save energy  
and carbon.**

We were able to implement a control strategy

with the t-mac device and we

**immediately benefitted from the**

**energy reduction.**

# Mini BMS controls

HEATING, LIGHTING, AIR CONDITIONING, REFRIGERATION, COMPRESSORS, PEOPLE.

Once metering is active, causes of consumption can be identified, areas for improvement are highlighted and an organisation understands how best to change the practices within the building. The next stage is control.

Control can come in many forms from local controls to full-scale BMS. With t-mac the controls are scalable to suit any businesses' need and budget. t-mac can control lighting, heating and air conditioning systems as well as compressors and other machinery. Control with t-mac can range from simple on/off to more complex controls such as set point limitation, managing fan speed and direction, and

control strategies such as interlocking windows with air conditioning, air conditioning with heating or door curtain heaters for example.




## INSTALLED AT



# connectivity

METERS, SENSORS, CONTACTORS, I/O MODULES AND 3RD PARTY SYSTEMS, CONNECT EITHER WIRED OR WIRELESSLY.

The t-mac device communicates data off site over wireless GPRS or Ethernet to a central server. Unlimited user access to the t-mac central server is through the online software suite via internet enabled PCs. Meters, sensors, contactors and other hardware systems are connected to the t-mac unit onsite either wired, wirelessly or via protocols such as Modbus, TCP/IP or Z-wave

-  **t-mac communicates via**  
GPRS or ethernet
-  **Hardware connects via**  
wired, wireless or protocols
-  **t-mac G3 devices**  
MAXI or MINI t-mac





# Iceland

## THE BUSINESS

Iceland is the UK's leader in frozen food. As a national multi-site business, it's imperative that they have visibility and insight into where, when and how they use energy and the power to control it. t-mac provides innovative software to enable users to track energy usage in real-time, 24 hours a day, 365 days a year. Plus, our smart building solutions offer clients the ability to connect energy intensive devices across multiple sites.

## INTELLIGENT BUILDINGS DELIVERING POWERFUL SAVINGS

We worked closely with Iceland to provide an optimised lighting control system to be rolled out across their 850 stores. This bespoke controls solution was designed and implemented by our engineering teams working alongside key stakeholders within Iceland.

The technology provides automated store lighting to optimise energy usage based on occupancy and trading times. Lighting has been split into zones and is controlled via a combination of timed outputs, alarm interfaces, and presence detection.

Some stores have implemented remote controls for internal environmental temperatures and remote fault-finding for maintenance purposes.

The solution has achieved a 15% lighting cost saving in the first year alone. Additional opportunities are also being investigated to identify further savings. Our team are working closely with Iceland to implement load shedding and load shifting activities to reduce electricity charges at peak DUoS and TNUoS times. By programming additional logic for the lighting and AC systems, Iceland can shift load from these time bands and reduce their bills further. This is expected to deliver further savings of up to 10%.

*"We selected t-mac BMS due to its ability to connect to our network, 'talk' to our existing ac units and report back. We can now react to faults/failures prior to the store realising they have an issue. The capability to change settings without requiring a member of staff to do so is a great element of the system. We required an easy use interface with potential for expansion which was a big draw of the BMS."*

**Graham Ireland**  
Head of Energy and Mechanical Services

15%

SAVINGS ACHIEVED  
IN FIRST YEAR

..... & .....

## Bespoke BMS

ENABLED CONTROLS  
SOLUTION  
IMPLEMENTED

..... & .....

10%

ADDITIONAL SAVINGS  
PROJECTED THROUGH  
LOAD SHIFTING &  
SHEDDING

.....

## TALK TO US TODAY

To find out more information  
about our Building Management  
service and how we can help you  
call 0330 303 3302 or  
email [hello@t-mac.co.uk](mailto:hello@t-mac.co.uk)

# clever cloud software

CONFIGURE, ENERGY ANALYSIS, REPORTING, BMS, SMART.DASH



## TRANSFORM BIG-DATA INTO REAL-TIME ENERGY INSIGHTS.

Efficient energy management can happen anywhere at any time; energy data and analytics need to be available in real-time, 24/7 and 365 days a year. The t-mac connected cloud software, apps and services have all the energy management tools and features you need to meter, monitor, control, report and display your building's energy management activities across multiple devices from desktop to smartphone; providing access anytime and from anywhere

The t-mac software suite is designed to suit all user requirements from dashboards for building occupiers, apps for those on the move, analysis and reporting tools for clever analytics through to BMS control platforms.

### ENERGY ANALYSIS

A powerful aM&T application allowing businesses to view, analyse and quantify metering data from mains utilities and sub-meters monitoring key activity areas. Perfect to help drive energy efficiency and save energy cost and carbon.

### REPORTING

Reporting creates custom analytics to visualise and report on businesses operations. See how environmental data as well as business processes such as footfall, FTE, sales and production figures as well as building/system control strategies affect energy consumption.

### BMS

BMS allows you to take control of your building and equipment by quickly implementing, amending and managing control strategies and tasks across single or multiple sites. Access, view, amend through the BMS app and platform.

### SMART.DASH

A responsive energy dashboard enables businesses to view, compare and share energy data with building occupants making energy management understandable for everyone. Using easy-to-digest dynamic animated charts and gauges, SMART.DASH quickly quantifies and visualises a building or an entire estates' energy consumption and performance.

### CONFIGURE

Configure is a t-mac unit configuration platform with the added facility of viewing and reporting on live metering, monitoring and control set points, as well as setting up alerts against undesirable activities

The t-mac cloud based software combines energy metering and monitoring, with building and equipment controls as well as business processes; a vital requirement for effective and proactive energy management and carbon reduction programmes.

### REPORTING



### ENERGY ANALYSIS



### BMS



### SMART.DASH





# Bespoke solutions

**T-MAC TECHNOLOGIES' RESEARCH AND DEVELOPMENT DEPARTMENT IS ALREADY WORKING WITH MANY OEMS (ORIGINAL EQUIPMENT MANUFACTURERS) WORLDWIDE.**

## ACCELERATED ROUTE TO MARKET

t-mac provides businesses with an opportunity to bring Machine to Machine (M2M) solutions to market quickly and effectively. Our engineers work with you to tailor elements of our existing technology and infrastructure to the your specific requirements centered around your products and market and clients needs.

## VARIETY OF APPLICATIONS

We have helped deliver M2M solutions based on t-mac's core technology in areas including HVAC equipment, industrial controls and fuel stock management.

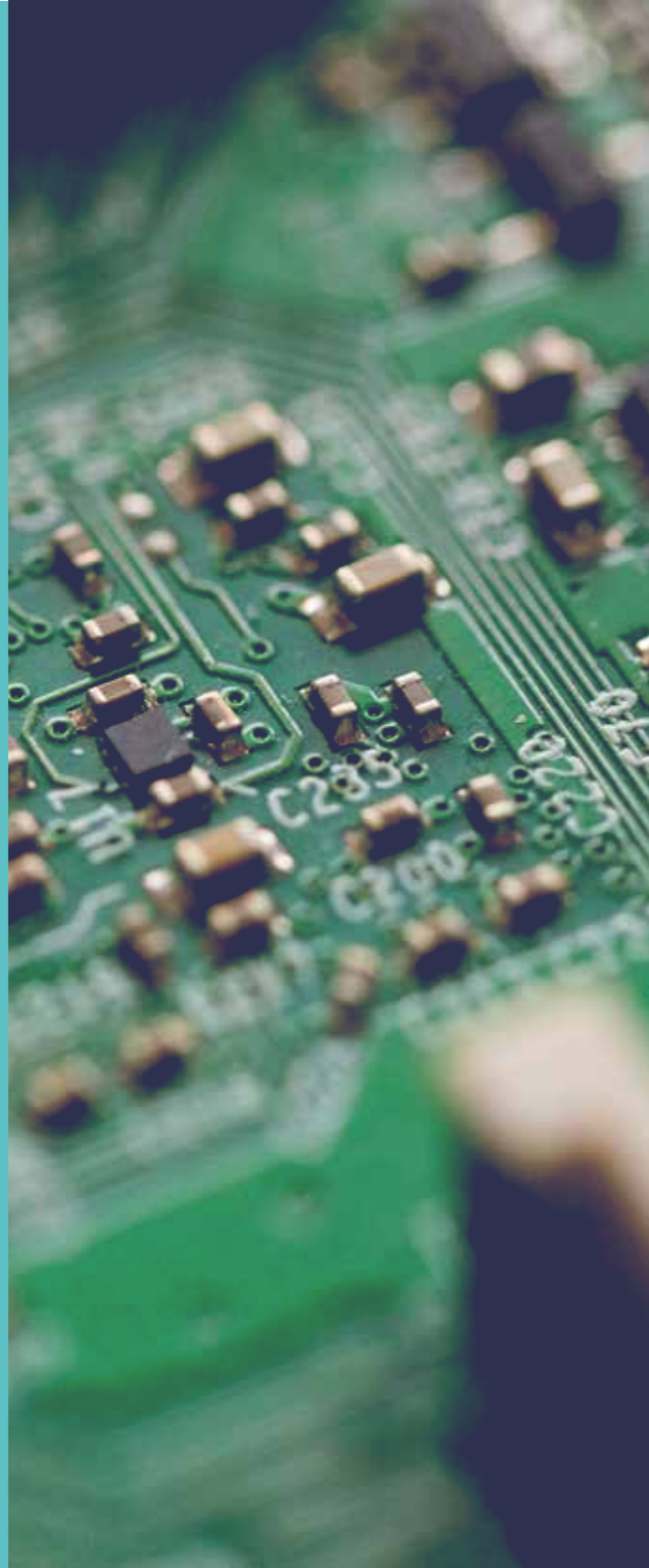
## PRODUCT DEVELOPMENT

t-mac's engineers cover all aspects of product development, from hardware and software development through to product certification and conformity testing. We always work to optimise designs while keeping costs low and functionality, flexibility, modularity and manufacturability high.

## MANUFACTURING

t-mac's in-house manufacturing division utilises the latest technology and processes. By manufacturing in-house we can ensure bespoke products are produced to the highest quality and with the shortest lead times.

\*November 2018



## Ladbrokes

### THE BUSINESS

Ladbrokes were keen to improve their energy efficiency in a bid to save energy and money. They enlisted our help and we initially trialled a Building Management System (BMS) in their Chesterfield store. This focused on controlling the Air Conditioning (AC) and ventilation equipment.

### Intelligent buildings delivering powerful savings

The Automatic Meter Reading (AMR) data gathered during the trial was used to analyse the overall effectiveness of the implemented system in Ladbrokes' Chesterfield store. Since installation, the control strategy produced a 4% energy saving for the site. We worked closely with Ladbrokes to develop a custom control system; known aptly as 'Lad-Mac', which specifically addressed the requirements identified in the trial. As the store had relatively low energy bills the new system needed to be small scale with an 18 month return on investment.

The BMS trial therefore focused on the store's AC and ventilation fans and applied a pre-set control strategy. By monitoring how they used the system, we were able to ensure complete satisfaction with the new control strategies.

An on/off switch was incorporated to the trial unit which, if required, could be used by staff to override the 'Lad-Mac' system and its pre-set control temperatures. By monitoring their usage of this, it was apparent the team rarely used these switches, indicating that the control strategy worked well.

Due to the nature of the retail business, Ladbrokes wanted to be able to change the strategy in each store so no communication over GPRS was necessary at this time, however the 'Lad-Mac' can be fully upgraded as required in the future. Ladbrokes have already saved £121,000 in just 4 months and we estimate they will achieve an annual saving of £338,000.



**£121,000**

SAVED IN JUST  
4 MONTHS

..... & .....

**£338,000**

EXPECTED ANNUAL  
SAVINGS

..... & .....

**Carbon  
emissions**

REDUCED, IMPROVING  
LADBROKES GREEN  
CREDENTIALS

.....

**TALK TO US TODAY**  
To find out more information  
about our Building Management  
service and how we can help you  
call 0330 303 3302 or  
email [hello@t-mac.co.uk](mailto:hello@t-mac.co.uk)

To learn more about our metering, monitoring and controls solutions  
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or email [hello@t-mac.co.uk](mailto:hello@t-mac.co.uk)

