

**aM&T + Control =
pro-active energy management**

Building Energy Management
Equipment Condition Monitoring

Reduces Carbon Footprint
Reduce Cost

aM&T + Control = pro-active energy management



Introduction

LISA wilkinson

Director

t-mac Technologies Ltd

Featuring:

Internet enabled, t-mac energy management & metering system

aM&T + Control = pro-active energy management



Need to know more than kWh...

aM&T (*automatic monitoring & targeting*) devices have quickly become the must-have monitoring accessory for business, but knowing your kWh is only the first step in energy management.

Influencers of energy consumption...

The crucial key to pro-actively reduce energy use and cost is to identify those external influences on consumption

e.g.. HVAC&R performance, lighting & temperature levels.

Once identified, these should be continuously controlled and as a result, energy consumption reduced!

Setting & meeting targets...

Research shows, buildings in the UK account for half of the country's carbon emissions

AIM: 20% by 2010 and 60% by 2050

To meet these targets business needs to reduce its energy consumption; it's the measures and tactics that we employ, which will be of utmost importance

Setting & meeting targets...

So how can we meet these targets?

...firstly you need to identify energy consuming equipment and activities

Equipment & building conditions...

Main culprits in energy loss are high energy using equipment (*i.e. boilers, air conditioning units & lighting*)

They can often leak energy without being detected or run in conjunction with each other, (boilers & a/c) or be left on out of hours.

aM&T + Control = pro-active energy management



Equipment & building conditions...

The result is not only costly to the environment, but also for business - in terms of high and unnecessary energy bills

Identify & manage energy culprits...

Once identified...Then you can manage!

To reduce emissions and minimise energy waste, business has to identify excessive energy use & waste; only then can control them

The business drive...

With escalating energy prices, business is embracing such energy management and reduction techniques and strategies.

Energy management and control soon becomes part of a businesses asset management activities

aM&T + Control = pro-active energy management



The business drive...

But it's not just 'cost' that's driving industry to look at, and manage its energy consumption...

Meet government legislation..

There is constant and increasing pressure for business to conform to government legislation, hencemore energy management protocols, logging systems and reports need to be produced to comply with these government requirements.

Business needs to consider..

- Display of Energy Certificate (DEC),
- Energy Performance Certificate (EPC),
- Carbon Reduction Commitment (CRC),
- Part L2,
- ISO 14001

...dashboards can be a great tool!

aM&T + Control = pro-active energy management



aM&T + Control...

The next generation of automatic monitoring and targeting (aM&T) kit that incorporates the facility for remote Control (+C) has revolutionised industry.

aM&T + Control = pro-active energy management



A perfect platform...

Innovative aM&T + C solutions, that enable business to not only meter but monitor and control external influencers, are providing the perfect platform to aid business in its energy reduction plans:

Monitoring...

24/7 monitoring of building and machine conditions:

- > Temperature
 - > Lux-levels
 - > Pressure
 - > Humidity

Controlling...

Remote management and control of:

- > Heating
 - > Ventilation
 - > Air conditioning
 - > Refrigeration
 - > Lighting
 - > Plant & machinery
- (especially high energy-use compressors)

Metering...

Remote metering of:

- > Mains supply (gas, water, electricity)
 - > Activity areas

aM&T + Control = pro-active energy management



Holistic energy management...

**Pro-active and effective energy
management and reduction**

aM&T + Control = pro-active energy management



EG: t-mac (wireless (GPRS) & online)

Using t-mac as an example, here's how technology can:

Identify what you need to monitor :

aM&T + Control = pro-active energy management



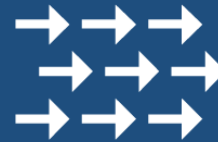
Connect any sensor to monitor conditions...



temperature



pressure



flow



volume



energy

And, with t-mac, identify?

- Mains gas consumption
- Mains electricity consumption
- Mains water consumption

- Sub metering for activity areas
 - Canteens & Datacenters or lighting & heating

- Temperature and humidity
...and many more!

And, with t-mac, identify?

- Once business starts to monitor conditions at each site, it can centrally view this information which, with t-mac, is remotely (*no requirement to attend site*) and online (*accessed over the Internet*)

Online software...

View all that you are monitoring and set parameters (ideal conditions)

- [-] t-mac Technologies
 - [+] Head Office
 - [+] Head Office
 - [+] Server Cabinet
 - [+] Mobile demo units
 - [+] Briefcase Demo
 - [+] Reports
 - [+] Views
 - [+] Users
 - [+] Contacts
 - [+] UOMs
 - [+] Dashboards
 - [+] Downloads

Head Office

STATUS ⏪ ⏩ ⏴ ⏵ ↺ ↻

Snapshot taken on 01/08/2006 12:27:43:

	Current	Setpoints	
		Low	High
[IN01] Server Room Temperature	22.91°C	-	-
[IN02] Design Suite Temperature	23.38°C	-	-
[IN03] Outside Temperature (South Wall)	15.35°C	-	-
[IN04] Boiler Return	25.55°C	-	-
[IN06] Corridor Temperature	24.35°C	-	-
[IN07] Office Temperature	23.33°C	-	-
[IN09] Server Room Humidity	47.88%	-	55
[IN10] Design Suite Lux Level	84.53Lux	-	-
[IN17] Red Phase Clamp !	59.3A	-	50
[IN18] Blue Phase Clamp	10.4A	-	-
[IN19] Server Room Temperature	24.42°C	-	30
[IN20] Ambient Temperature	22.01°C	-	-
[FRQ2] Electricity Meter Input	68.4kW	-	-
[CNT2] Electricity Meter Reading	370314.8KWh	-	-
[VAR01] Time Variable	1	-	-
[VAR02] Door Switch Counter	277	-	-
[DO01] Boiler	Idle	-	-
[DO02] Outside Light	Off	-	-
[IN13] Front Door	Closed	-	-

Know performance & consumption...

Now, through constant monitoring you can see (i) how each building, asset (HVAC) or equipment is performing. (ii) When it's in use, and (iii) how much energy it's consuming and (iv) why

...from this, business can look to identify efficiencies and waste...

Identify efficiencies and/or waste...

Of building activities and equipment performance

- if it's being used out-of-hours
- if air-con is on at same time as boilers, for example
- if temperature or lux-levels are unnecessarily too high/low

aM&T + Control = pro-active energy management



**How do these GPRS enabled,
aM&T + Control devices work?**

How do these GPRS enabled, aM&T + Control devices work?

using t-mac as an example, it works by being installed within, on or beside the asset. It works in three ways

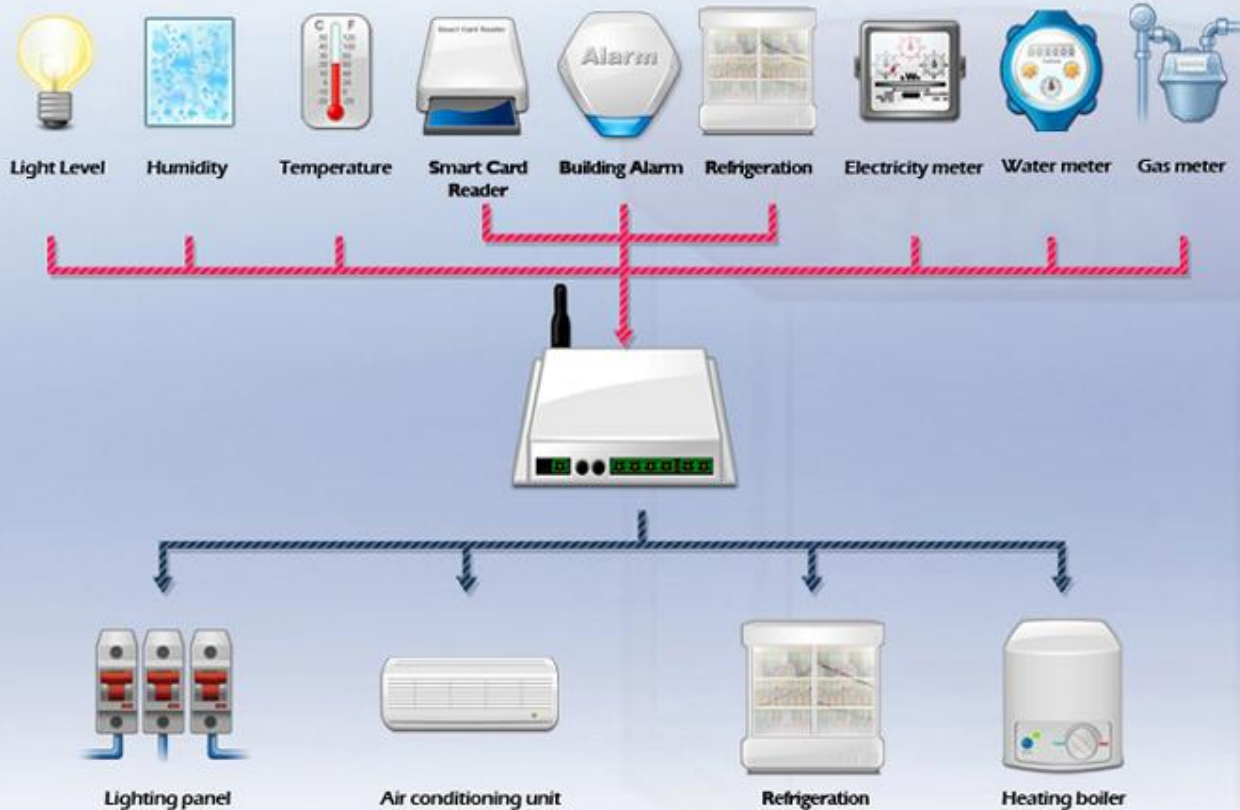
- (i) remote monitoring
- (ii) remote logging
- (iii) remote process control

aM&T + Control = pro-active energy management



How do these GPRS enabled, aM&T + Control devices work?

Retail & Financial Outlets / Multi-sites: remote building maintenance & management (mini BMS)



How do these GPRS enabled, aM&T + Control devices work?

1. Configure the t-mac to **monitor** an entire building or item of plant, HVAC&R or metering equipment, recording critical level criteria
2. From continuous monitoring, t-mac will send **alerts** to managers, via SMS/email, if levels fall outside pre-set criteria (kWh deviation, excess load or temp change)

How do these GPRS enabled, aM&T + Control devices work?

3. Instant notification allows users to immediately take **remedial action**, such as turning equipment off or on, either automatically or pre-programmed through the t-mac web-portal.

How do these GPRS enabled, aM&T + Control devices work?

4. Through continuous monitoring of sensors connected to analogue and digital inputs, t-mac can action complex **control** tasks to assist in the control of plant equipment and HVAC&R.

NB: t-mac tasks require no programming knowledge, they're simply linked together to form complex control schemes based on any of t-mac's inputs and outputs.

How do these GPRS enabled, aM&T + Control devices work?

MODBUS protocol can also allow for seamless monitor and control of 3rd party equipment (*i.e. A/C and machinery*)

Serial protocols...

Connect a high quantity, and variety, of 3rd party manufacturer's machines, equipment and meters.

With MODBUS communication channels, devices like t-mac can read and record a large number of machines and meters (up to 256 registers) via a single serial port.

Serial protocols...

By monitoring and controlling equipment in this way, in addition to or as opposed to standard inputs & outputs, business can achieve greater monitoring and control, gathering information from third-party equipment including embedded controllers and energy metering.

Serial protocols...

For energy management, the MODBUS protocol is key in helping businesses to improve their power factor; and also gain more information on their metering and sub-metering.

‘reading’ more than simply kWh and take more than a simple pulse-output, it can now ‘read’ kVAh, kVArh, kW, kVA, kVAr, individual phase currents and power factor.

Benefits...

- Maximum efficiency
- Ensure energy legislation compliance
- Management of consumption and energy use
- Identify faults/remote diagnostics
- Prevent downtime/stoppage/breakdowns
- Damage limitation
- Reduce running costs

Benefits...

- Machine condition monitoring
- Reduce wastage
- 24/7 live information
- Tailored settings/alerts
- SMS and email alerts
- Simple reporting
- Ease of use

How do these GPRS enabled, aM&T + Control devices work?

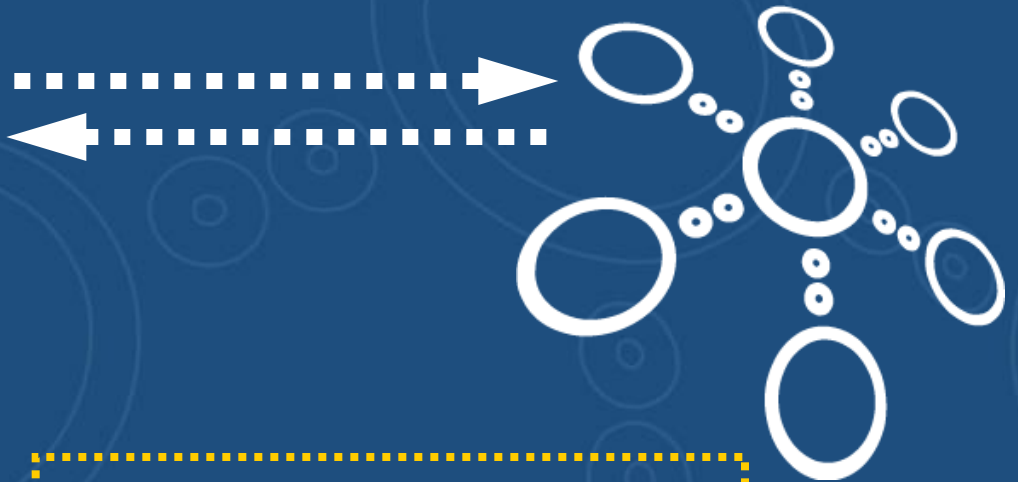
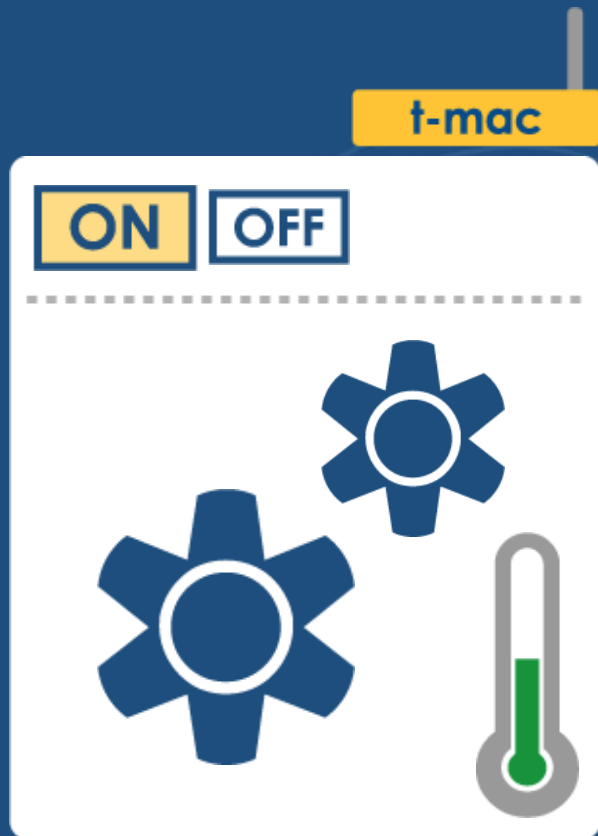
With MODBUS, business can expand the energy management capabilities to action

- Remote automation of a building assets and machinery
- Pre-set ability according to changing conditions
- Remote diagnostics – for fault finding
- Change settings of its onboard PLC

aM&T + Control = pro-active energy management



Monitoring...

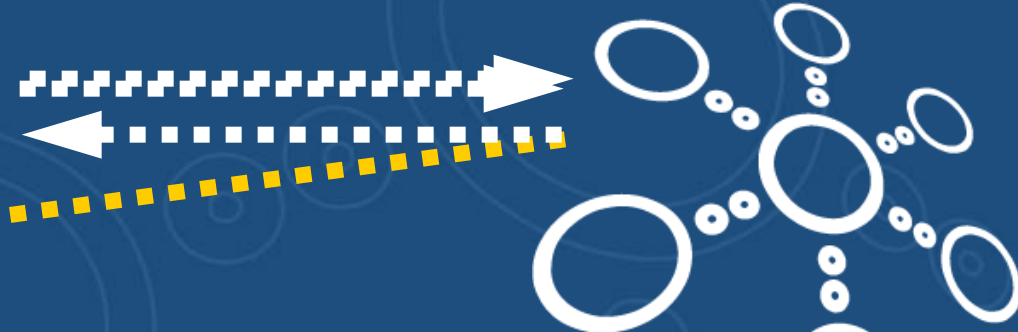
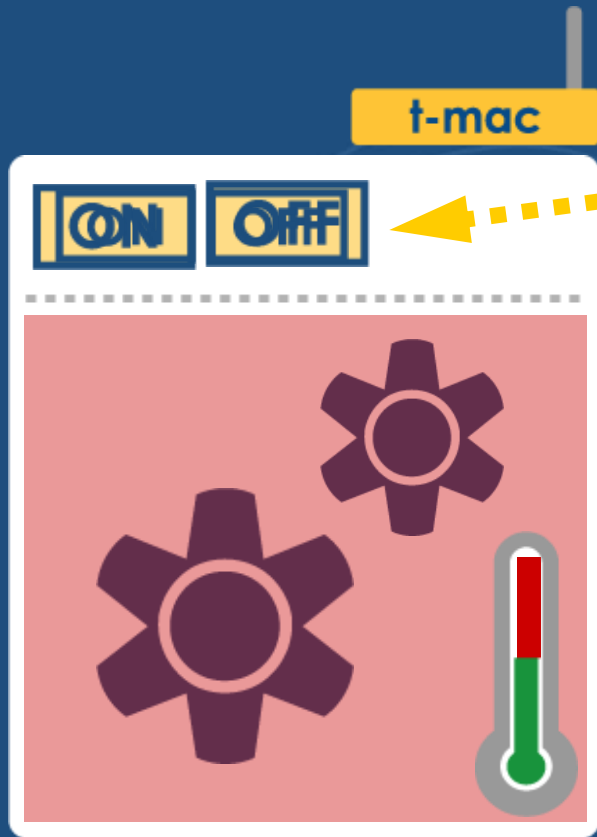


24/7 Monitoring

aM&T + Control = pro-active energy management



Control...



24/7 Monitoring
Remote Control



aM&T + Control = pro-active energy management



SMS/email alerts & online activity logs...



Live & Historic
Activity Logging



Why use GPRS enabled, aM&T + Control...

Benefits

- Early warning system so faults can be rectified ASAP and in some cases, remotely
- Collect accurate and up-to-date status data about faulty equipment

Why use GPRS enabled, aM&T + Control...

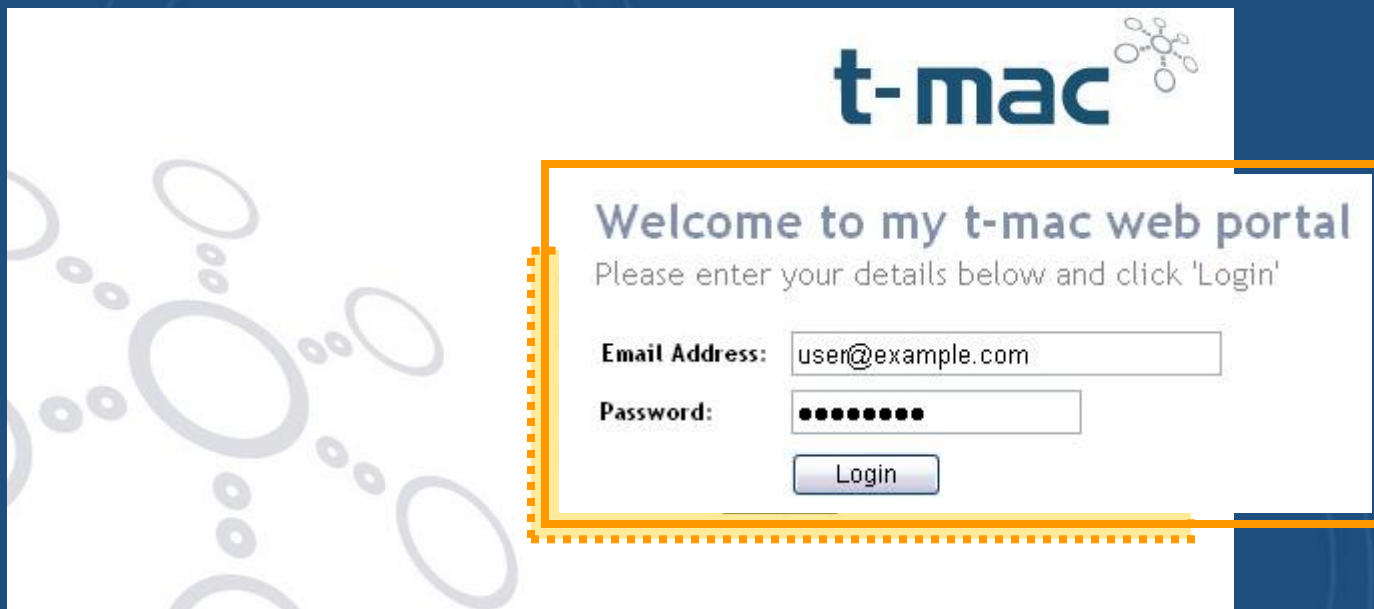
Benefits

- Monitor and control via analogue and digital inputs, outputs and RS-232/485 serial communication channels
- Wireless (GPRS) transmission of data off site to a central managed server

Accessible over the Internet...

Benefits

- Dedicated web-page log-in facility over the internet

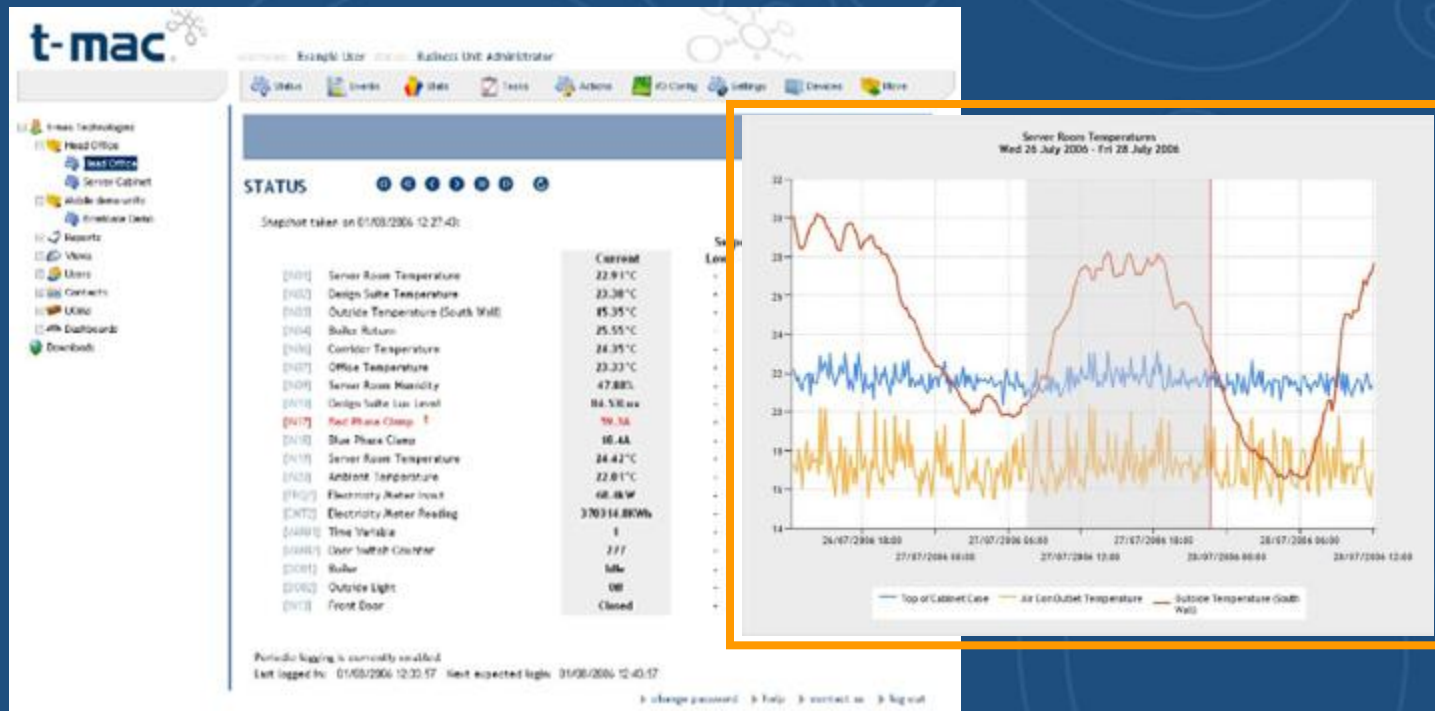


The screenshot shows the t-mac web portal login interface. At the top right, the t-mac logo is displayed. Below it, the text reads "Welcome to my t-mac web portal" followed by "Please enter your details below and click 'Login'". There are two input fields: "Email Address" with the value "user@example.com" and "Password" with a masked password of "●●●●●●●●". A "Login" button is positioned below the password field. The entire login form area is highlighted with a dashed orange border.

Interactive...

Benefits

- View data as interactive tables and graphs



The screenshot displays the t-mac web interface. On the left is a navigation menu with items like 'Head Office', 'Server Cabinet', and 'Reports'. The main content area is titled 'STATUS' and shows a 'Snapshot taken on 01/08/2006 12:27:40:'. Below this is a table of system metrics:

ID	Value	Unit
[001]	22.91	°C
[002]	23.28	°C
[003]	15.35	°C
[004]	25.55	°C
[005]	24.35	°C
[007]	23.23	°C
[009]	47.885	
[018]	84.5	lux
[017]	99	mA
[010]	10	AA
[019]	24.42	°C
[020]	22.81	°C
[022]	68	kW
[023]	370314	kWh
[0400]	1	
[0401]	111	
[001]	116	
[002]	00	
[003]	00	

To the right of the table is a line graph titled 'Server Room Temperatures Wed 26 July 2006 - Fri 28 July 2006'. The graph plots three data series: 'Top of Cabinet Case' (blue line), 'Air Inlet/Outlet Temperature' (yellow line), and 'Outside Temperature (South Wall)' (red line). The x-axis shows dates from 26/07/2006 18:00 to 28/07/2006 12:00. The y-axis shows temperature in degrees Celsius, ranging from 14 to 32. The graph shows a clear daily temperature cycle, with the outside temperature peaking around 27/07/2006 18:00 and the cabinet case temperature following a similar but less extreme pattern.

aM&T + Control = pro-active energy management



t-mac also offers...

Benefits

- No costly software required
- No static IP addresses

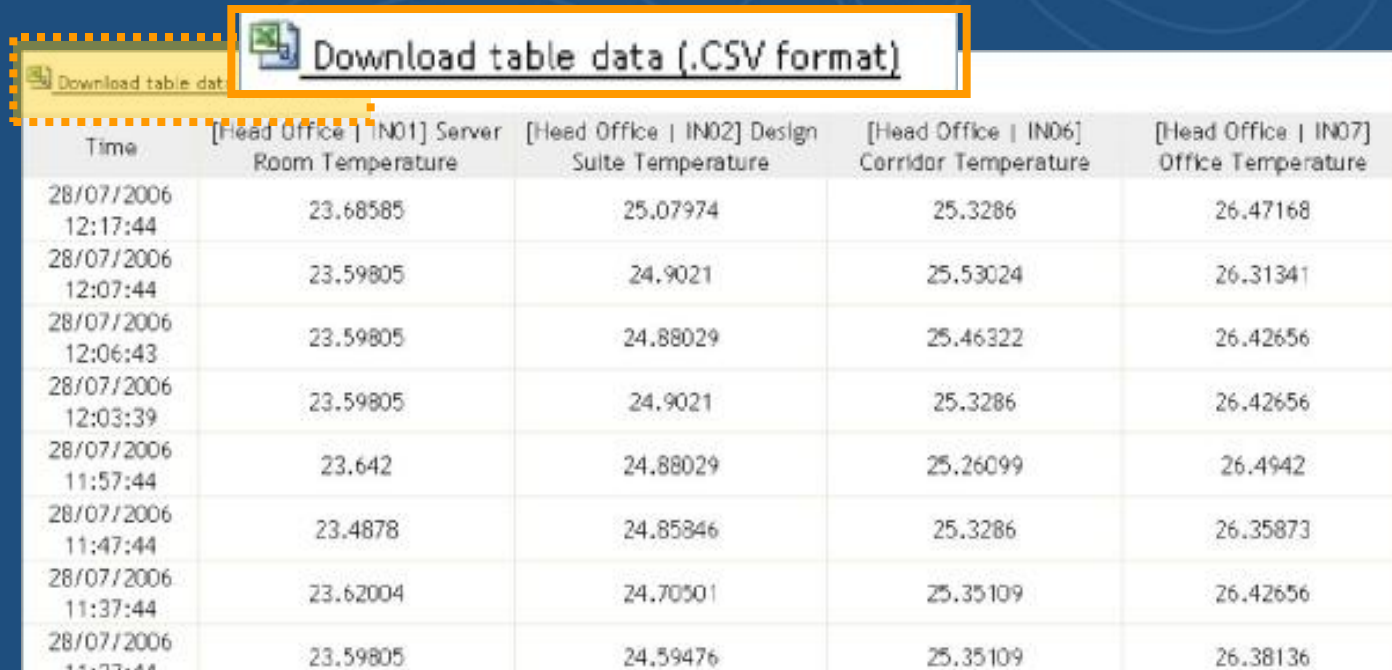
Energy management...

- Once you begin to monitor and control activities and asset conditions/operations business can immediately look to reduce/eradicate waste and hence reduce energy consumption.
- Technology can assist business further... by providing reports and analysis software.

Data display & download...

Benefits

- Easy management reporting

A screenshot of a web application interface. At the top, there is a button labeled "Download table data (.CSV format)" with a download icon. Below the button is a table with five columns: "Time", "[Head Office | IN01] Server Room Temperature", "[Head Office | IN02] Design Suite Temperature", "[Head Office | IN06] Corridor Temperature", and "[Head Office | IN07] Office Temperature". The table contains ten rows of data, each representing a timestamp and four temperature readings.

Time	[Head Office IN01] Server Room Temperature	[Head Office IN02] Design Suite Temperature	[Head Office IN06] Corridor Temperature	[Head Office IN07] Office Temperature
28/07/2006 12:17:44	23.68585	25.07974	25.3286	26.47168
28/07/2006 12:07:44	23.59805	24.9021	25.53024	26.31341
28/07/2006 12:06:43	23.59805	24.88029	25.46322	26.42656
28/07/2006 12:03:39	23.59805	24.9021	25.3286	26.42656
28/07/2006 11:57:44	23.642	24.88029	25.26099	26.4942
28/07/2006 11:47:44	23.4878	24.85946	25.3286	26.35873
28/07/2006 11:37:44	23.62004	24.70501	25.35109	26.42656
28/07/2006 11:33:44	23.59805	24.59476	25.35109	26.38136

Energy management...

Reporting

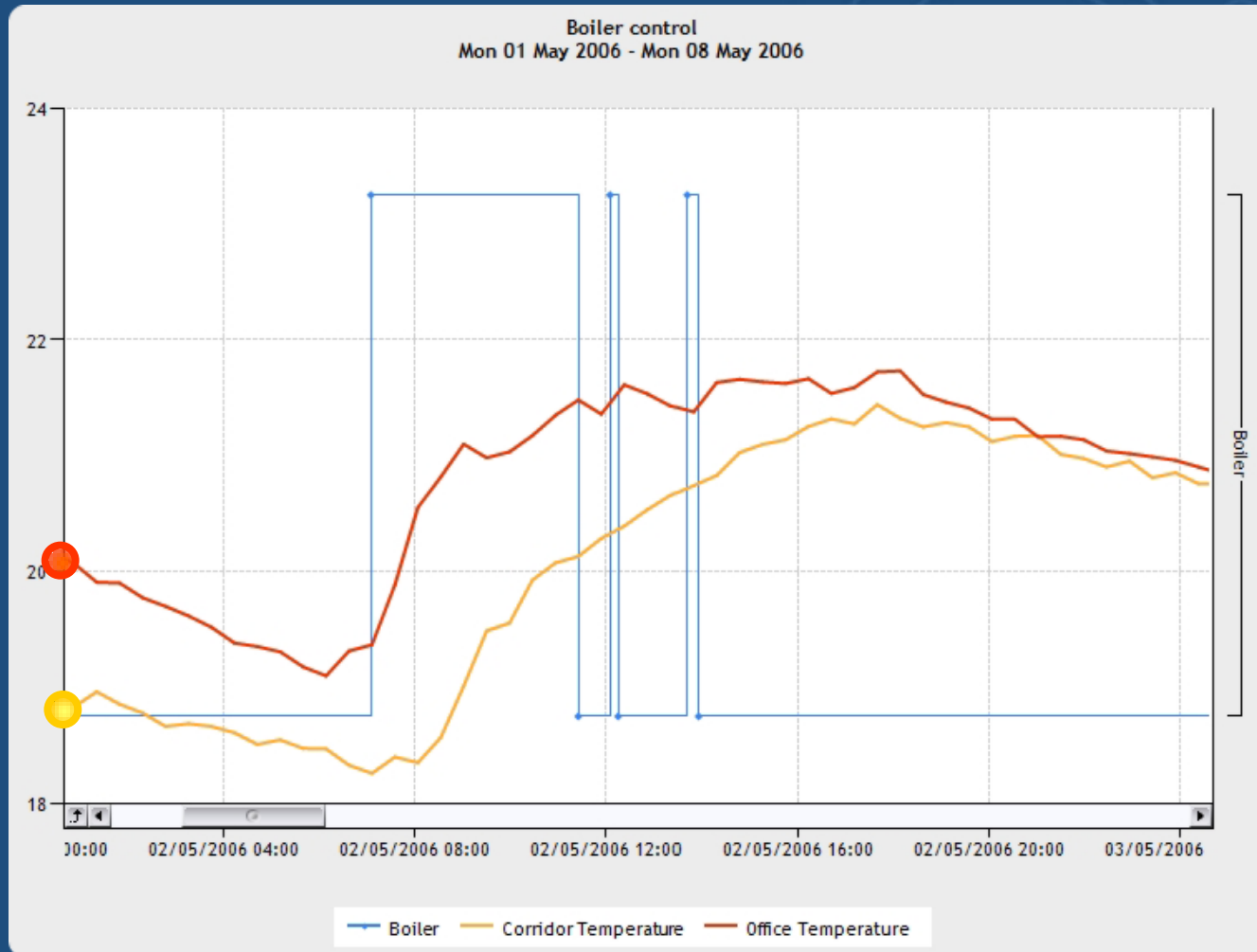
- Analyse and produce valuable management information, relating to buildings and equipment conditions; associated wastages, hence energy and asset inefficiencies and cost
- Determine and measure where and how much energy is being used over a specific period of time and compare it to annual targets

Energy management...

Analysis

- Identify opportunities to make substantial savings on running costs
- Undertake energy audits to help identify authentic and often unusual energy saving opportunities

Boiler Control...

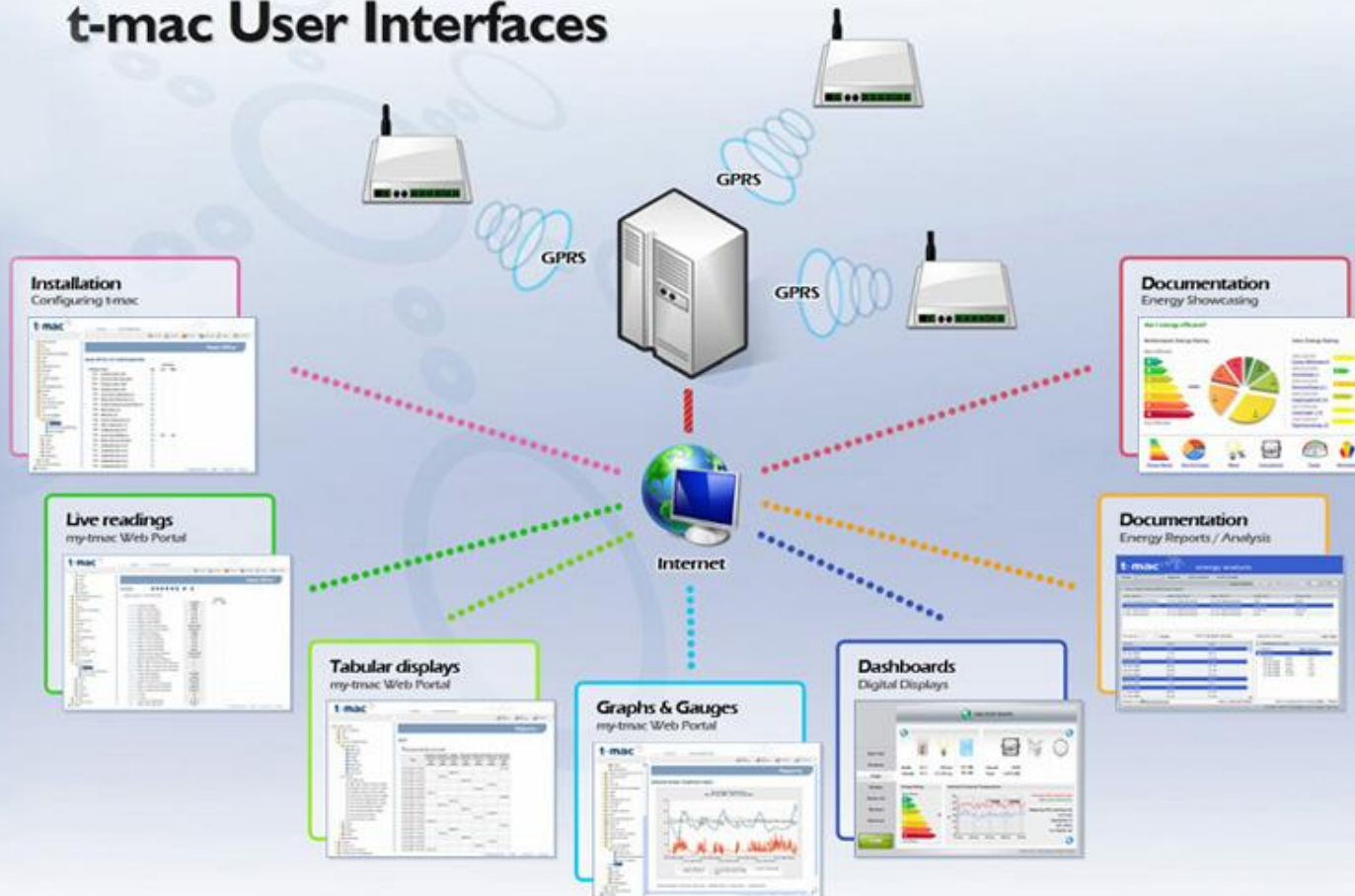


aM&T + Control = pro-active energy management



Analysis software...

t-mac User Interfaces



Analysis software...

- An interface between the user and the building equipment being monitored
- Details, through on-screen customised or generic graphics, the sites, assets, machines or metering being monitored
- Creates a real-time view of the area being monitored pictorially, showing the activities, live data and statistics instantly

Analysis software...

- Gain live information not only on energy use (metering) for example, but also on those factors and activities which contribute to their total energy bill.
- Once business can see usage patterns and those contributors, energy managers become empowered and, using accurate data, can formulate energy reduction plans

Analysis software...

t-mac's energy analysis dashboard can:

- Quantify and also showcase their energy consumption patterns and targets
- Provide information on permanent display
- Give live displays of equipment or a building's energy use plus its reduction targets, benchmarking or efficiency practices

Analysis software...

t-mac's energy analysis dashboard can:

- Convert collected data into a more recognisable form, e.g. converting raw energy readings into meaningful business data, such as *money saved*, or indicating industrial machine vibration as *high, medium or low-alert*
- It can also calculate how much energy is being used by each site, and draw comparisons on cost and energy savings easily.

Analysis software...

Electricity

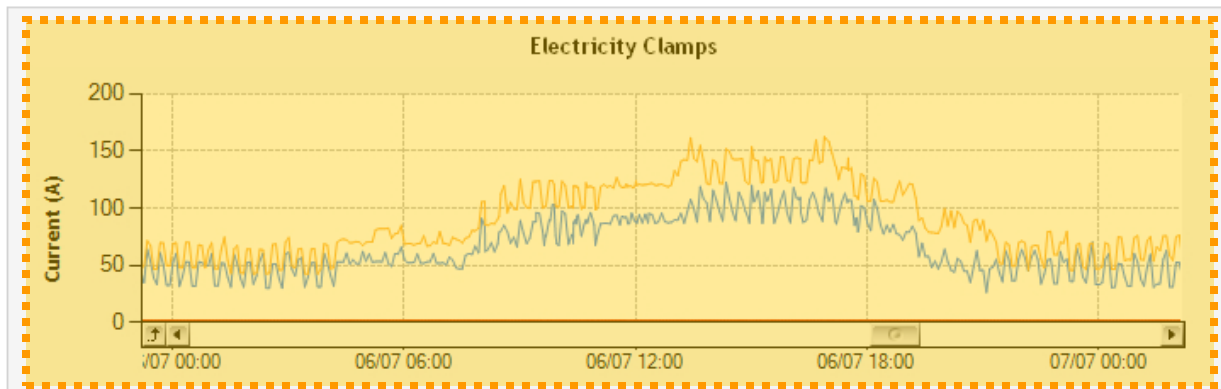
Water

Boiler

Other

Use the drop list controls on the right to select the chart values.

Date Range: Chart Type:

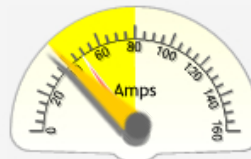


Electricity Gauges

[Last Reading Taken: 14/07/2006 13:55:44]



Current Input 1

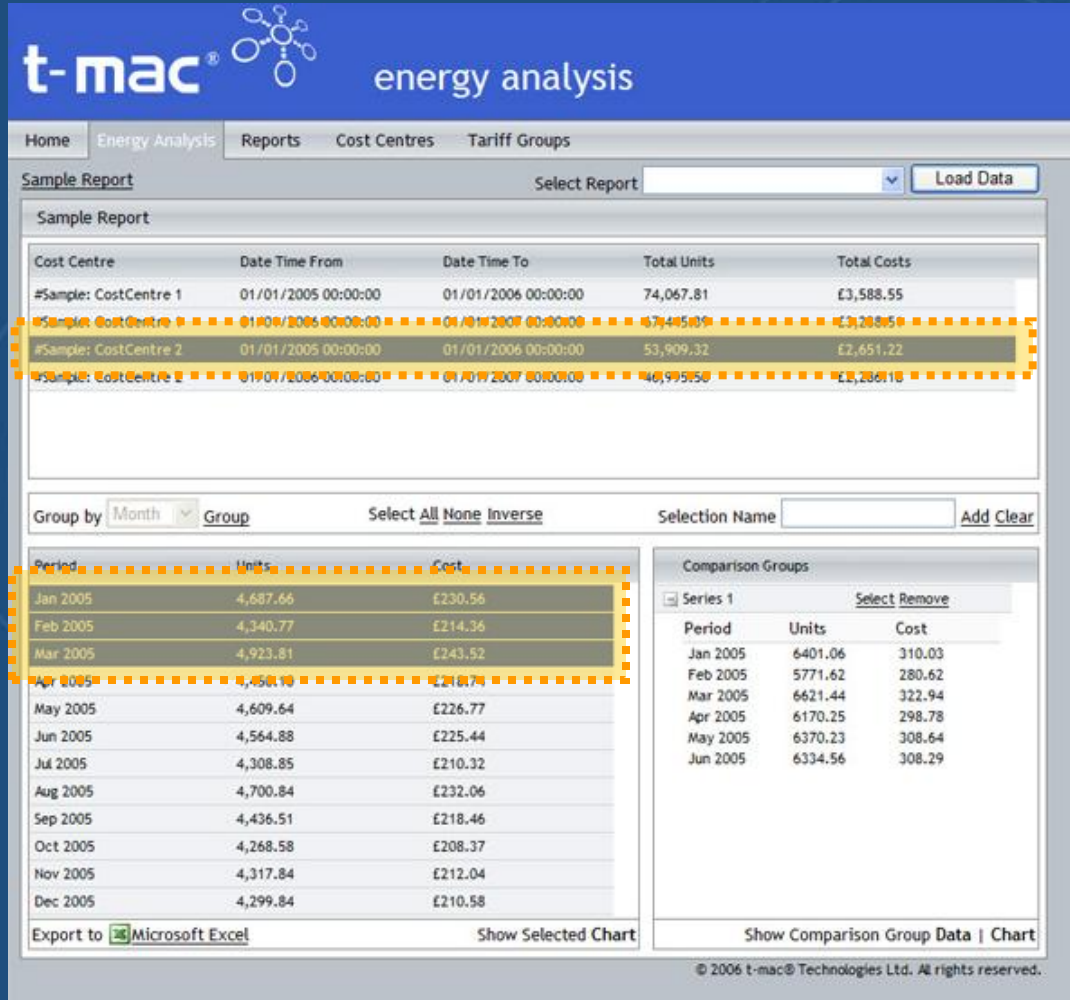


Current Input 2



Current Input 3

Analysis software...



The screenshot shows the t-mac energy analysis software interface. At the top, there is a navigation bar with 'Home', 'Energy Analysis', 'Reports', 'Cost Centres', and 'Tariff Groups'. Below this is a 'Sample Report' section with a 'Select Report' dropdown and a 'Load Data' button. The main content area displays a table of sample reports with columns for Cost Centre, Date Time From, Date Time To, Total Units, and Total Costs. Below this is a 'Group by' section with a 'Month' dropdown and a 'Group' button. To the right of this is a 'Selection Name' field and an 'Add Clear' button. The bottom section contains two tables: 'Period' and 'Comparison Groups'. The 'Period' table shows monthly data for 2005, and the 'Comparison Groups' table shows data for 'Series 1' across the same months. At the bottom, there are buttons for 'Export to Microsoft Excel' and 'Show Selected Chart', along with a 'Show Comparison Group Data | Chart' link.

Cost Centre	Date Time From	Date Time To	Total Units	Total Costs
#Sample: CostCentre 1	01/01/2005 00:00:00	01/01/2006 00:00:00	74,067.81	£3,588.55
#Sample: CostCentre 1	01/01/2005 00:00:00	01/01/2007 00:00:00	67,445.09	£3,208.51
#Sample: CostCentre 2	01/01/2005 00:00:00	01/01/2006 00:00:00	53,909.32	£2,651.22
#Sample: CostCentre 2	01/01/2006 00:00:00	01/01/2007 00:00:00	46,995.50	£2,280.18

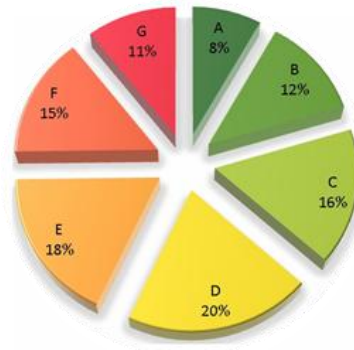
Period	Units	Cost
Jan 2005	4,687.66	£230.56
Feb 2005	4,340.77	£214.36
Mar 2005	4,923.81	£243.52
Apr 2005	4,450.10	£218.74
May 2005	4,609.64	£226.77
Jun 2005	4,564.88	£225.44
Jul 2005	4,308.85	£210.32
Aug 2005	4,700.84	£232.06
Sep 2005	4,436.51	£218.46
Oct 2005	4,268.58	£208.37
Nov 2005	4,317.84	£212.04
Dec 2005	4,299.84	£210.58

Period	Units	Cost
Jan 2005	6401.06	310.03
Feb 2005	5771.62	280.62
Mar 2005	6621.44	322.94
Apr 2005	6170.25	298.78
May 2005	6370.23	308.64
Jun 2005	6334.56	308.29

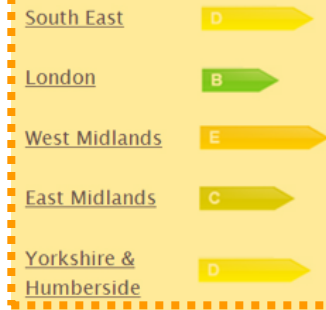
Analysis software...

Am I energy efficient?

Global Energy Rating



Regional Energy Ratings



Energy Rating



Activity Groups



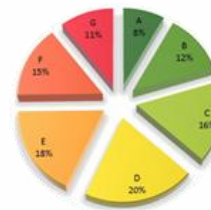
Waste



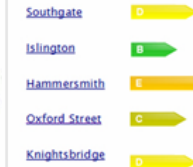
Consumption

Am I energy efficient?

London Energy Rating



Branch Energy Ratings



Energy Rating



Activity Groups



Waste



Consumption



Target



Benchmark

Analysis software...

Monthly energy report - July 2006



Lowest energy consumers

Site	kWh	+/- last month
Portsmouth	2264	+23
Wolverhampton	2390	-151
Leicester	2787	+84
Exeter	3255	-257
Bath	3401	-201

Highest energy consumers

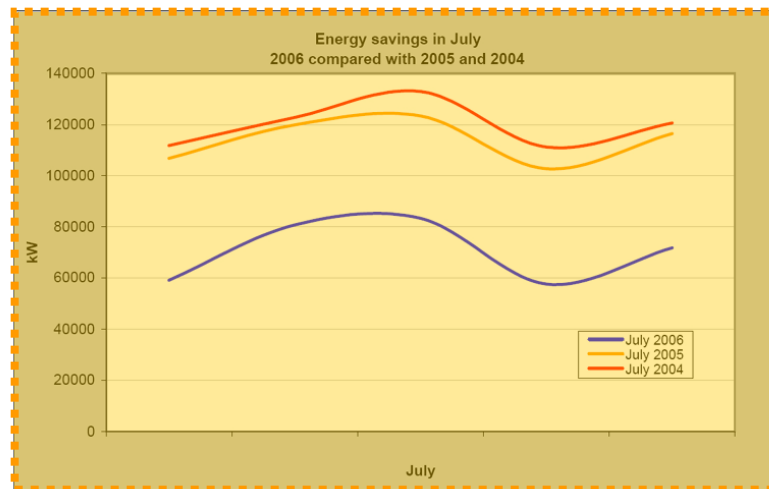
Site	kWh	+/- last month
Hereford	13097	-1064
Salford	12880	+2307
Edinburgh	12341	-167
Ripon	10670	-479
Canterbury	9853	+106

Comparison with June 2005

	kWh
Total usage (June 2005)	569230
Total usage (June 2006)	352810
Saving	216420 (38%)

Comparison with June 2004

	kWh
Total usage (June 2004)	599344
Total usage (June 2006)	352810
Saving	246534 (41.1%)



Analysis software...

Ignoring the need to accurately monitor and analyse equipment conditions will inevitably incur more cost in terms of energy consumed, shortening equipment life-cycle and ultimately will be detrimental to the environment.

Summary...

It is the way which we reduce our energy consumption, and the measures and tactics that we employ, which will be of utmost importance. However, the problem we face is that many people aren't employing the correct measures to reduce or even monitor energy consumption.

Summary...

Being energy efficient is more than just switching off the lights at night and turning off the computer at the end of the day – *in isolation these simple measures are not enough*. In order to reduce carbon emissions from buildings, owners and managers need to devise energy management practices and techniques.

Summary...

The main culprits in energy loss from commercial and residential buildings are high energy using equipment, such as boilers and air conditioning units. This kind of equipment can often leak energy without being detected by the user – which is not only costly for the environment but also for business in terms of high and unnecessary electricity bills.

Summary...

In order to reduce emissions, excessive energy consumption and areas for improvement to minimise this waste must be identified. The installation of energy monitoring devices can aid in this energy plight and are a key tool in helping to meet increasing government legislation.

Energy monitoring devices...

Take advantage of the available energy metering, monitoring and control equipment.

But look for the best systems, that offer the following key features...

Remote access & wireless (GPRS)...

Key Features

- Remote monitoring
- Remote data logging
- Remote process control
- Always on GPRS transmission
- Managed central server
- Customised front-end
- View all assets from a single domain name

Technology benefits...

Specifically

- Provide improved/intelligent maintenance and reports which help business comply with building regulations and engineers know the nature of a fault before arriving on site
- Help conserve energy
- Minimise machine downtime
- Extend equipment lifecycle

Technology benefits...

Specifically

- Provide energy management of individual equipment and entire sites to help identify opportunities for energy reduction and performance
- Monitoring equipment effectively
- Identify inefficiencies instantly and fix any issues, before they occur

Technology benefits...

Specifically

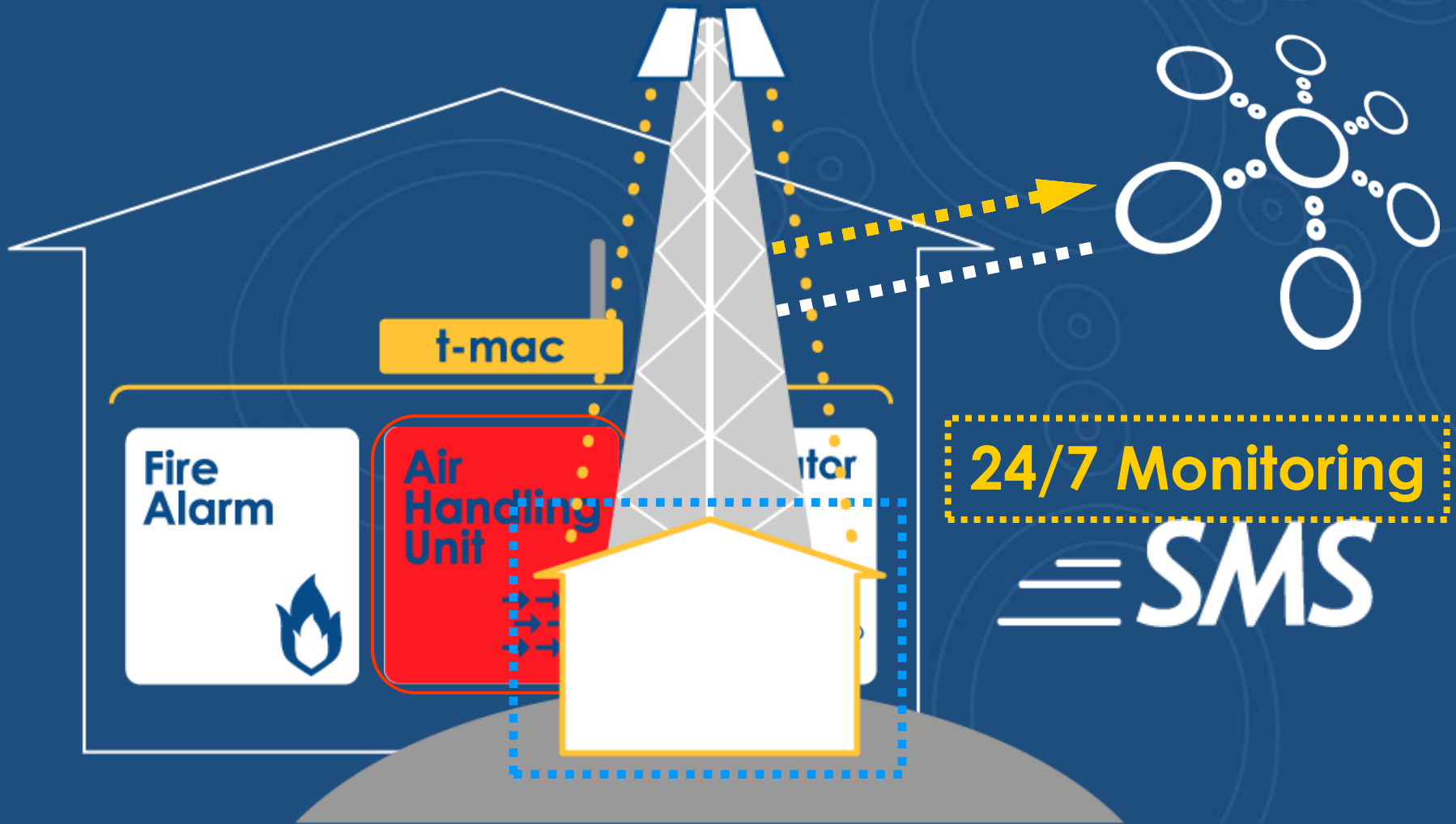
- Helps reduce energy consumption
- Effective and remote energy management can reap immediate financial returns; it can also boost energy and time savings and allow greater control

aM&T + Control = pro-active energy management



Remote condition monitoring in practice

Case studies / Telecommunication



aM&T + Control = pro-active energy management



Condition monitoring in practice

Case studies / Telecommunication



≡ SMS

Conclusion...

Using energy wisely is of prime importance to all businesses in all industry sectors

Conclusion...

But...

- what are the benefits?
- what's the ROI?
- can they help with EPBD?

FAQs...

Q: What benefits can be gained by installing aM&T + C devices

- know your energy consumption in pounds and pence on a half-hour basis.
- Know where your costs lie & assess which activity could provide the quickest ROI.
- Identify peaks in consumption immediately & rectify to reduce costs

FAQs...

Q: What benefits can be gained by installing aM&T + C devices

- identify key energy consumers & their associated running costs
- control key energy consumers to reduce running costs

Business needs to identify excessive consumption or areas for improvement to minimise waste

FAQs...

Q: What's the ROI?

aM&T + C equipment usually has a 6-12 month ROI depending on the building

eg: retail outlets, where lighting is usually left on out-of-hours, the cost benefits of knowing lighting is on & remotely controlling to switch it off immediately, covers the cost of t-mac equipment & installation.

FAQs...

Q: Energy managers, under the Energy Performance of Building Directive, are now responsible for accurately measuring their annual energy and water consumption. Will automatic monitoring devices provide a solution to that problem?

Yes. Consumption monitoring with such equipment provides information required by the EPBD.

aM&T + Control = pro-active energy management



at t-mac Technologies...

At t-mac tech we are working in partnership with a number of energy consultants to ensure our system's software incorporates the requirements for energy managers and their conformance to EPBD .. hence Part L2, CRC, DEC and EPC.

aM&T + Control = pro-active energy management



at t-mac Technologies...

In addition, we are also working with a number of local councils to provide transparent information for stakeholders on a buildings energy rating

- t-mac's online software is providing business with live and online Energy Ratings (A-G) and hence certification

Energy Showcasing Dashboard



ONE STOP SHOPS

Inside 25°C 40 Lux 26% RH **Current** 17 kW
Outside 5°C 3,951 Lux 71% RH **Total** 4,042 kWh

Energy Rating
 More Efficient
 A
 B
 C
 D
 E
 F
 G
 Less Efficient

Internal & External Temperatures

Liverpool City Council uses 100% Green Electricity
 Reducing CO2 emissions by 1738 KG equivalent to 5793 Miles in a family car

Old Swan OSS - Derby Lane, Old Swan, L13 6QA



ONE STOP SHOPS
 ENERGY CONSUMPTION COMPARISON

	kWh/Month	kWh/m ²	kWh/Hours Open
Belle Vale	4,162	13	24
Broadway	0	0	0
Dingle	4,596	9	27
Kirkdale	4,334	16	25
Knotty Ash	7,905	21	46
Old Swan	4,042	13	24
Wavertree	4,677	16	27

Key

- kWh consumed last month
- kWh consumed last month per m² of the buildings floor area
- kWh consumed last month per hour the building was open

aM&T + Control = pro-active energy management



So, why aM&T + Control?...

Smart metering or simple metering of mains electricity, gas and water is only one step to effective energy management, it only gives you kWh data

So, why aM&T + Control?...

Equipment, that provides more information (kVa, kVar & Power Factor); allows for remote & automatic control of site-based equipment provides platform for maximum efficiency

So, why aM&T + Control?...

aM&T + C equipment monitors site conditions & usage. It helps implement activities (through control) for peak performance and provides reporting services in-line with a business's monthly or annual sustainability reviews & energy reduction targets.

Go one-step further...

Therefore, it's important to note that remote energy management systems that go one-step further than smart metering are of more benefit to business; companies should therefore look for suitable aM&T +C equipment, complete with suitable online software & future-proofed solutions.

Go “beyond” smart-metering...

To conclude, metering of the mains is the first step to energy management and reduction. This step is certainly a benefit, however by:

Need to Meter, Manage & Control...

1. monitoring the mains and sub-meters,
2. assessing site-based conditions and usage and
3. controlling equipment for peak performance and minimum energy consumption

aM&T + Control = pro-active energy management



Need to Meter, Manage & Control...

business can gain a more pro-active & cost-effective approach to **energy management**

aM&T + Control = pro-active energy management



MINI t-mac

MAXI t-mac



t-mac 1U

aM&T + Control = pro-active energy management



[any Questions?]