µWEAVE M2M telemetry

Overview

The µWEAVE system is an "out of the box" machine-to-machine (M2M) telemetry solution enabling companies to remotely monitor, control and manage equipment via the Internet. It comprises a remote gateway, central web-based management application and specialised M2M services. It is a generic platform enabling OEMs and Value Added Resellers (VARs) to build a wireless telemetry solution tailored to their business and offer managed services within their markets. µWEAVE offers network administration, communication, centralised database storage, alarm processing, notification, reporting, control and optimisation of remote, mobile and fixed assets. It can be tailored to the application needs and deployed within weeks, offering a fast Return on Investment (ROI). The µWEAVE system provides a rapid route to delivering business value through reduced costs, increased revenues and an increased level of customer service. Why "re-invent the wheel"?

Product	Description
µWEAVE software & services	Central management platform
µWEAVE Gateway hardware	Remote GSM/GPRS telemetry

Internet remote monitoring & control

Monitor Manage Enhance Service

Enabling Solution Providers to manage remote assets for end users through a service-based business approach

Do you know the status of your remote assets? Without real-time communication, you have no understanding of the problems that your remote equipment may be causing within your business. M2M telemetry is a toolset to understand how assets perform, where the true value is derived from the gathered information. This enables you to manage your business more effectively. Where does your focus lie; your core business or developing the underlying tools? µWEAVE is an "out of the box" telemetry platform that enables you to focus on your business at the application level. It provides all of the end-to-end building blocks which can be configured to meet your system level needs from a single provider. µWEAVE is offered with a service-based business model as a foundation for Solution Providers to offer value added services to end users in their markets. Simple solutions work best, where the value to the business is easily understood.

Key Features

- Central web-based management
  - Communication (monitoring and control)
  - Database storage
  - Alarm processing
  - Notification (Email, SMS)
  - Reporting
  - Configuration
  - Administration
  - Optimisation
  - Security (Admin, customer, site level)
- Remote telemetry hardware
  - GSM/GPRS network modem
  - Communication (TCP/IP, PPP, Application level)
  - Data logging
  - Alarm processing
  - Simple AT command line
  - Real Time Clock Scheduling
- Specialised M2M services
  - Application Hosting
  - Customisation (Private label reports & data delivery)

Benefits

- Proven M2M Solution
- Proof of concept in hours
- Deploy solutions in weeks
- Prove business models fast
- Enhance business rapidly

Delivering

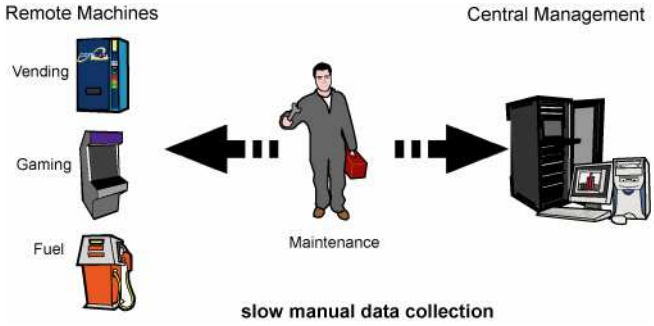
- Rapid Return on Investment
- Efficient service & maintenance operations
- Reduced operational costs
- Reduced downtime
- Increased customer service
- Increased revenues
- Fast response to field problems
- Ongoing service revenues

Enhancing your business

Problems lie across the business as a whole

A combination of issues arising from design, manufacture, installation, maintenance and operational usage can contribute to poor customer service and lost business. Problems are compounded where companies do not have direct access to the remote equipment in the field, which are often installed, maintained and operated by other partners within the value chain.

Machines largely remain "unconnected", where data collection is often manual as a result of call-out or scheduled site visits. Although collected data may ultimately populate a back office system or server based application, it is a slow process making it difficult to make business decisions.



slow manual data collection

Without real-time information from remote machines, many problems are not visible to decision makers.

Common Problems

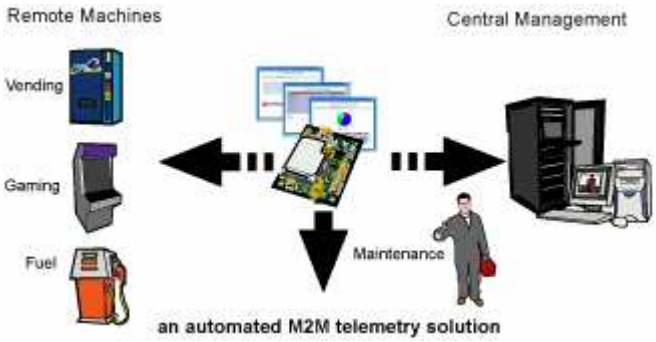
- Downtime issues
- Slow response to problems arising in the field
- Multiple calls to fix problems
- Reliability
- Operational and supply chain in-efficiencies
- Poor logistics
- Abuse of use
- Security issues
- Slow manual data collection
- Lengthy update process for delivering new information
- Many more ...

The Solution

The solution lies with automated data collection from remote machines through M2M telemetry. Information can be derived from any remote machine to help resolve problems within the business, for example: -

- How is the equipment used?
- Does it need maintenance?
- Is it about to fail?
- How long has the equipment been running?
- Has it been operated outside of permitted limits?
- Are the consumables running low
- What needs replenishing?
- Who used it when and are they authorised?
- When was it last calibrated and serviced?
- Has it been configured and set up correctly?
- Is the machine performing poorly?

Direct collection of real-time data holds value to all within the value chain for differing management reasons. Making the data available on an ongoing service basis provides the foundation for new revenue streams and business models. Are you looking for new ways of enhancing your business, perhaps through pay-per-usage, migrating to a leased sell or offering managed services?



an automated M2M telemetry solution

Avoid M2M adoption pitfalls

M2M adoption is susceptible to failure when the business case is not fully understood and the ROI cannot be demonstrated in the short term (6 – 18 months: source e-principles). Ensure that your M2M solution gains the early "buy-in" of customers and management by making the business benefits visible in the short term.

Solution—Keep it simple!

Solve core problems within your business, where the benefits are easily understood by all the stakeholders. As an "out of the box" M2M solution, µWEAVE provides rapid time to market. It promotes successful M2M adoption through rapid deployment, early recognition of the business benefits and a rapid ROI.

Choose a proven M2M telemetry solution that enables you to focus on your business. Having proven your business model, Comtech offer several routes to a more integrated solution.

Why Comtech

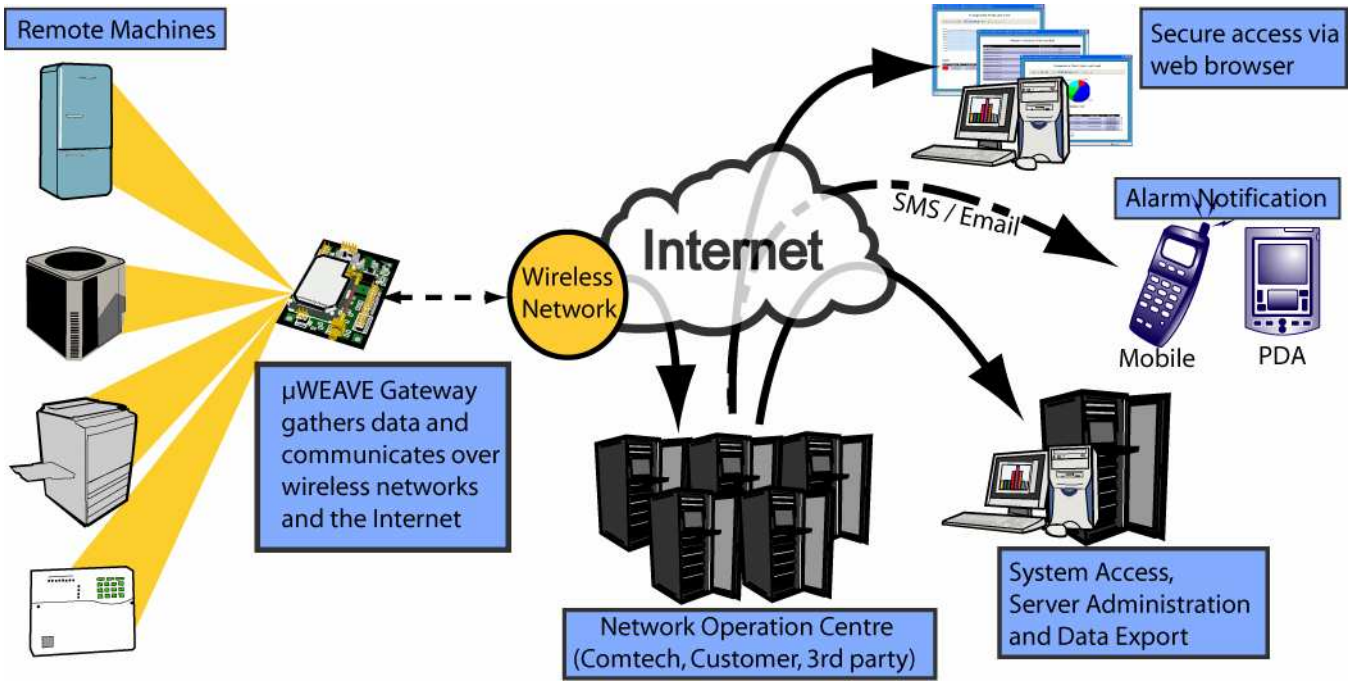
Comtech target products and services to achieve controlled steps forward where customers gain early M2M success. This serves as a solid foundation for migrating to more integrated solutions. Solutions can be scaled through to complex enterprise integration when the customers' business and markets are ready. The secret lies with enhancement to the existing business and systems rather than wholesale changes.

Comtech are unique in the market offering hardware, software and services suited to many diverse markets. Why would you want to system's integrate elements of the end-to-end solution to create your complete solution, when this adds additional work and risk? Comtech offer a "one stop shop" to provide a seamless solution. Are you an OEM, System's Integrator or VAR with market specific expertise? Comtech can provide the "M2M within" your application through a partnership approach enabling you to dominate your chosen market.

µWEAVE M2M Telemetry System Overview

Remote monitoring and control of machines, devices and assets via the Internet

Comtech's µWEAVE M2M telemetry system is a communication platform enabling companies to monitor, control and manage their remote machines, devices or assets via the Internet. It is available "out of the box" enabling companies to integrate, tailor and deploy their connected" applications in weeks! µWEAVE enables the status of remote machines to be monitored and configured at a central location on the Internet using a standard PC browser. It processes alarms and provides automated notifications by email or SMS when exceptions occur. Understand how remote machines operate through configurable online reports, enabling you to consolidate and compare machine information across sites and end users at the enterprise level. µWEAVE is available under private label to complement your own brand. OEM's are able to embed it direct into their machines. System integrators and VARs are able to monitor legacy machines in their chosen market. Simply configure the system to meet your application needs .... and deploy!



Remote Field Equipment

Your remote machines, devices or assets, which contain valuable information such as status, alarms, operational usage, transactions and diagnostics. This can be transferred to the µWEAVE Gateway through a serial interface.

µWEAVE Gateway

Intelligent GSM/GPRS gateway enabling the remote machine or monitored device to communicate via the Internet with the µWEAVE application. It provides data logging, alarm checking, scheduling, configuration and communication over GSM, GPRS and the Internet.

Network

A public or private Wide Area Network (WAN) to connect remote machines, devices or assets with central management applications such as GSM, GPRS, PSTN and the Internet

µWEAVE

Web-based central management application offering remote monitoring and control of machines via the Internet. It provides communication, data logging, alarm processing, notification, reporting, configuration, optimisation and network administration.

Users

Central PC and field-based mobile users are able to monitor, control and administer the network of remote machines and devices via the Internet, through a standard PC browser. They can respond to automated email and SMS alarm notifications to enhance business.

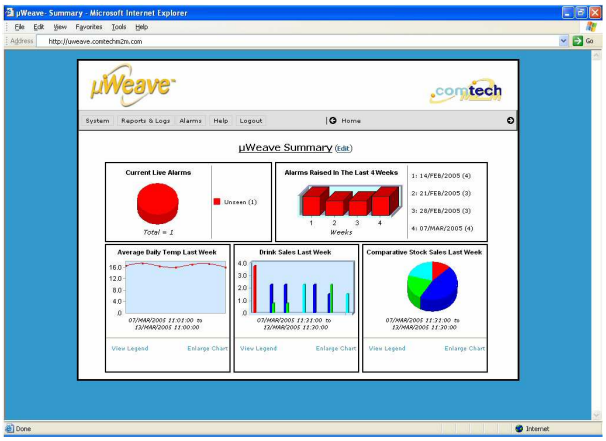
Business Case

- Pay as you use
- Fraud detection for usage and replenishment
- Managed services
- Legislative reporting
- Product optimisation
- Wrap-up maintenance with product for a service offering
- Proactive maintenance to minimise downtime
- Streamline operations to reduce cost
- Usage patterns for optimising and enhancing business

µWEAVE software
Web-based central management platform

µWEAVE software management application features

µWEAVE is an M2M telemetry platform that enables you to build your own central management application for monitoring remote machines and devices via the Internet. It provides elements that are generic to many M2M telemetry systems and a toolset that enables you to configure the system for your chosen application. Simply configure the system to meet your application needs rather than develop your own application! µWEAVE enables you to offer a managed service to your customers ... why "re-invent the wheel?"



Alarm processing

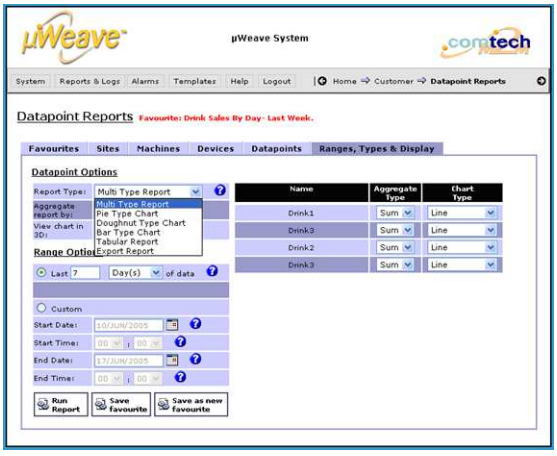
The management application processes central and remotely generated alarm exceptions, which potentially require user attention.

Notification

Alarm events may be automatically notified to users by email and/or SMS by the management application

Configuration

Users are able to centrally configure remote device configuration or control settings. This includes the customer's remote application and the µWEAVE Gateway configuration such as scheduling, communication configurations and alarm thresholds.



Security

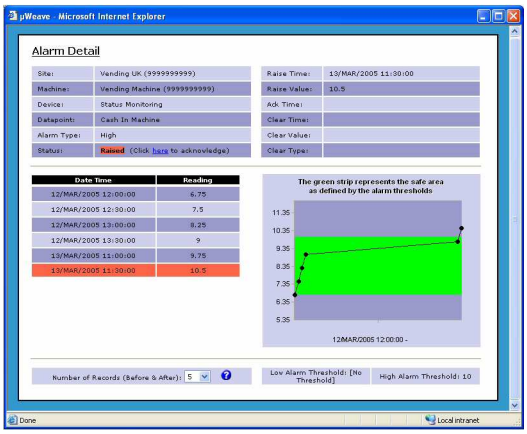
µWEAVE offers three levels of security access at administrator, customer and site level, where each level is configurable for read/ write access.

Communication

Seamless 2-way data transfer between remote machines and the central management application over the wireless Internet. Higher level management is incorporated to ensure resilient operation.

Database

Enterprise wide data to and from remote machines and devices are stored in a database offering a central location for monitoring and controlling the system as a whole.



Reporting

µWEAVE offers configurable reports on data collected from remote devices. Reports are available at remote device level or consolidated across sites and customers.

Optimisation

µWEAVE is able to compare data across regional sites and customers. It provides the tools to understand usage variations in order to optimise remote machines and business operations.

Administration

µWEAVE provides network administration of both remote machines and central IT users for a hierarchy of system administrators, customers, sites, machines, devices, datapoints and setpoints.

Tailoring µWEAVE software to your application

µWEAVE provides remote data collection for any application in a template form. It can be tailored to your needs through a combination of flexible customer configuration and Comtech system set-up.

Customer configuration

- **Templates** — machine, device and data initialisation
- **Alias** — create your own naming conventions
- **Application** — configure templates, reports and alarms
- **Machines** — administer remote machines onto the system
- **Users** — administer users with appropriate security access
- **System** — schedules, communication and system set-up

Comtech system set-up

- **Logos and style** — integrate your logos and colour schemes
- **System-setup** — your private label data collection system "powered by Comtech M2M" hosted with its own domain.
- **Customisation** — custom reports undertaken by Comtech to meet your needs

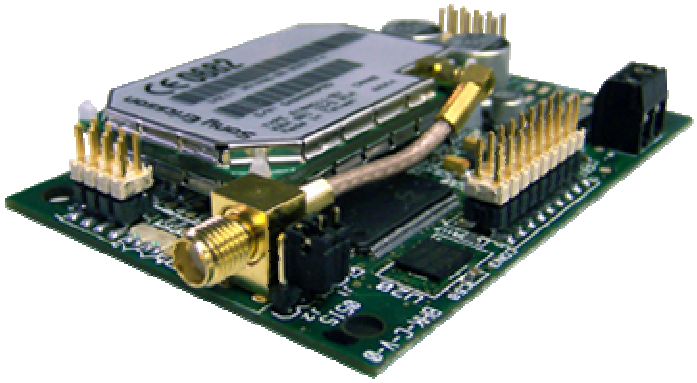
µWEAVE Gateway
Remote telemetry hardware

µWEAVE Gateway features enabling remote machine connectivity

Communicating with remote machines via the Internet requires more than just a modem! It requires the intelligence to deliver the data to a central management application in a robust and resilient manner. The µWEAVE Gateway is an embedded remote monitoring device that logs data from your remote machine and delivers it to the µWEAVE monitoring application via the GSM/GPRS network and the Internet. µWEAVE Gateway enables your remote machines, devices and assets to be connected into your business.

Serial Interface

The remote machine interfaces to the µWEAVE Gateway via a serial port. An enhanced AT command set is supported enabling the remote machine to control all the µWEAVE Gateway features.



Real Time Clock

An onboard Real-Time-Clock (RTC) maintains time for scheduling local logging events and initiating communication with the central management application.

Data logging

The remote machine is able to log data into the µWEAVE Gateway's non-volatile memory using serial port commands. The remote machine simply "adds records" to the µWEAVE Gateway.

Centrally configured

The µWEAVE Gateway can be central configured to maintain remote machine configuration, alarm threshold and communication settings.

Local status reporting

The remote machine can request status information via the serial command line for scheduling, alarm and communication status enabling the remote machine to make connectivity decisions.

Internet protocols and GSM / GPRS interface

The µWEAVE Gateway supports integrated TCP/IP protocols and a GSM/GPRS modem for ease of communication over GPRS and the Internet with the central µWEAVE software application

Alarm processing

As each record is added, the µWEAVE Gateway checks the logged data for alarm conditions, providing alarm status information that can be used to initiate communication with the central application.

Scheduling

The µWEAVE Gateway provides scheduling for logging local data and initiating communication with the central management application.

Database synchronisation (DSYNC)

Integrated protocols to transfer data between the µWEAVE Gateway and the central µWEAVE software application. This will upload any data logged into the µWEAVE Gateway and download any new configuration from the µWEAVE software application.

µWEAVE Gateway system integration

System integration is easy—configure the data format at the central application and add a driver to the remote machine.

Remote machine driver (example available)

Control software within the remote machine, implementing:-

- **Power-up DSYNC** — to collect time and configuration settings.
- **Log data —** to "add records" to the µWEAVE Gateway.
- **Check status** — to check alarm and scheduling status.
- **DSYNC** — to transfer data to the central application and collect any new configuration

Applications

- Escalators and elevators
- Industrial monitoring
- HVAC and refrigeration
- Condition monitoring
- Environmental monitoring
- Building automation
- Remote utility sub-metering
- Vendor managed inventory
- Vending machines
- Gaming machines
- Ticketing machines
- Office business systems
- Remote data collection
- Security systems
- Domestic appliances ...

M2M telemetry adoption in 5 simple steps

Easy adoption through an “out of the box” M2M telemetry solution

Follow our 5-step plan for successful M2M telemetry adoption. It provides a structured approach to remotely monitor your machines, enabling you to offer managed services to your customers. This approach enables you to evaluate M2M telemetry within hours, integrate it within days and deploy a pilot or rollout system within 8 weeks! Enhance you business today through an “out of the box” M2M telemetry solution to deliver immediate benefits to your business.

Starter Kit

The µWEAVE starter kit provides an end-to-end monitoring system "out of the box" for rapid evaluation. Gain internal management "buy in" by rapidly demonstrating the benefits of remote monitoring applied to your equipment.

Purchase µWEAVE

Purchase µWEAVE so that we can set up your M2M telemetry system, enabling you to administer your own system, monitor your machines and offer a managed service. Consultancy is available to aid adoption and reduce risk.

System Set-up

Comtech will set up and host the system with its own domain incorporating your logos and style. This enables the system to be private labelled under your brand, enabling you to offer M2M solutions and services tailored to your market.

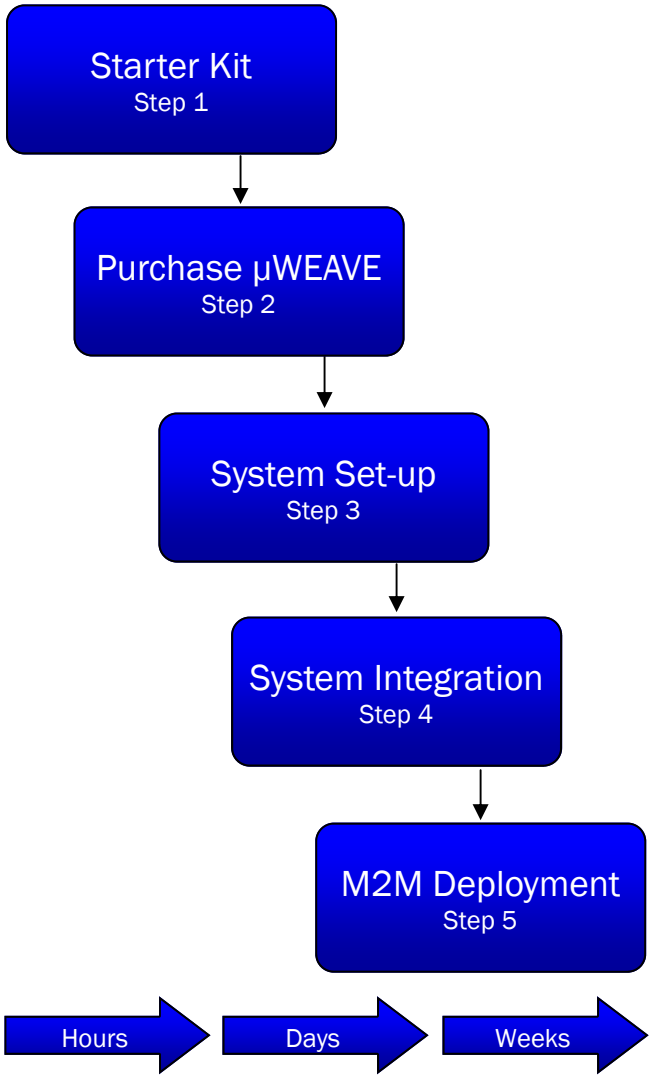
System Integration

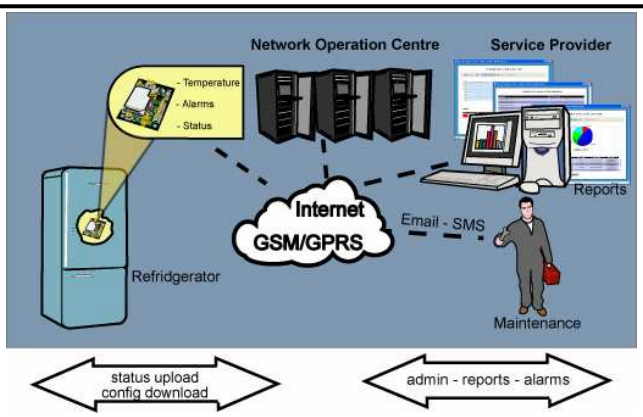
M2M telemetry adoption is made simple - all you need to do is configure the µWEAVE management system for your application and integrate the µWEAVE Gateway into your remote machine or monitoring device.

M2M deployment

Deploy your application specific M2M-enabled system within 8 weeks! By leveraging the strengths of a robust, resilient and proven technology, you can focus on your core business and show immediate benefits.

µWEAVE enables OEMs, System Integrators and VARs to deliver M2M solutions to end users in their chosen market, through an added value managed services approach.





Remote Temperature Monitoring

Assets such as food and medical supplies need to be maintained in a temperature controlled environment to prevent losses and damage. Due to the high value of assets and potential health risks, storage temperatures need to be monitored and recorded at several points throughout the day.

Problem

Traditionally, temperature monitoring relies on a manual process which often results in unreliable records and paper trails due to the "human element". Hard wired automated solutions often require an onsite PC for local management or reliance on the end customer's network for remote access.

Solution

µWEAVE enables OEM’s and VAR’s to build an automated remote temperature monitoring system utilising GSM/GPRS and the Internet. The system provides automated data collection and provides notification via email and SMS when temperature alarms are detected. It offers centralised management via the Internet for data logging, alarming, reporting and administration.

Benefits

- Fast response to problems
- Offer a managed service
- Reduce losses
- No reliance on the end customer’s network

Applications

- Refrigeration & food
- Medical & Pharmaceutical
- Environment
- IT server rooms

Solution Examples

Trial new machine prior to launch

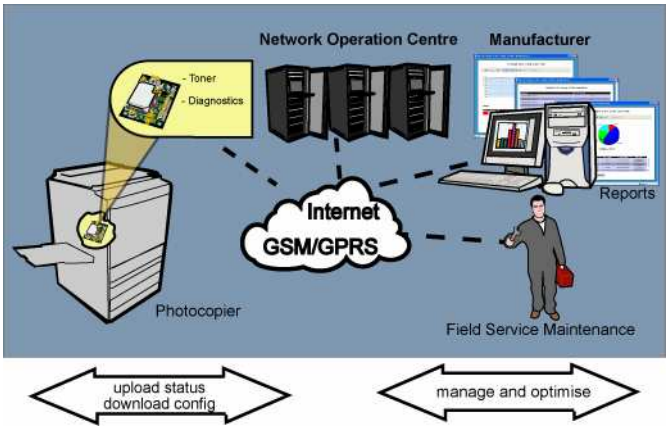
New machines are often trialed in the field prior to product launch so the design can be tested and optimised in order to reduce returns and increase reliability. This may be particularly important for machines needing refill of consumables such as photocopiers where suppliers may wish to profile inventory from forecast usage.

Problem

Information is traditionally collected manually from the trial machine, often by 3rd parties outside the control of the manufacturer or consumable supplier. This is often slow and unreliable such that new machine designs are not optimised to their full potential, leading to reliability problems and increased maintenance costs. Furthermore, poor forecasting of consumable replenishment can lead to increased stock holding or lost consumable sales.

Solution

µWEAVE enables OEM's, service operators and consumable suppliers to monitor new product performance utilising GSM/GPRS and the Internet. It provides automated data collection at scheduled times and notification of exceptions via email/SMS. It offers web-based management for data logging, alarming, reporting and administration.



Benefits

- Optimise design
- Increase reliability
- Forecast consumable usage
- Reduce maintenance burden

Applications

- Domestic Appliances
- Gaming and Vending
- Printers
- Photocopiers

Mobile Field Service Automation

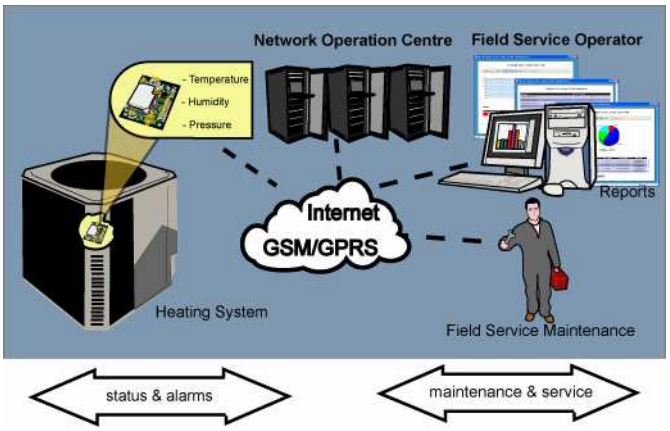
Field service engineers are increasingly automated within the mobile enterprise through mobile devices such as PDAs. However, unnecessary site visits and downtime occur where remote machines are not connected automatically within the mobile enterprise also.

Problem

Mobile field service automation results in inefficient operations where the remote machine does not directly provide real time status information. This is compounded for smaller companies that often rely on "paper trail" systems for job management without any form of automation. For larger companies, integrating data from remote machines with existing CRM and ERP systems is complex and non-trivial especially where the business model is not proven.

Solution

µWEAVE enables Field Service Operators to build an automated field service system connecting remote assets, central management and mobile field devices utilising GSM/GPRS and the Internet. The system provides automated data collection and notification via email and SMS when alarm exceptions are detected. Alarms can be acknowledged and monitored centrally or by a mobile device.



Benefits

- Reduce downtime
- Fast response to problems
- Efficient operations
- Offer a managed service

Applications

- HVAC
- Refrigeration
- Industrial Control
- Power and Utilities

Remote Alarm Monitoring

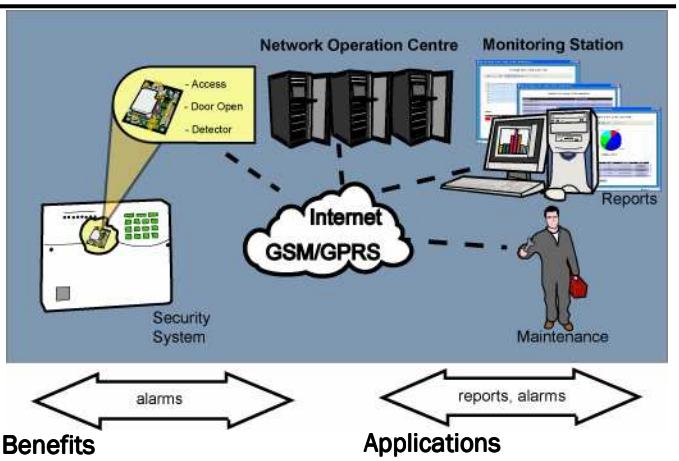
Problems with remote equipment such as HVAC and process control need early detection so that they can be resolved to minimise downtime. Alternatively, security and access control systems need warning of unauthorised entry or usage.

Problem

The traditional approach is to support local management of alarms at site level, which requires dedicated onsite management. This is usually suited to larger sites, which can justify the additional management costs. However this is often difficult to justify for small remote sites where single items of equipment are deployed.

Solution

µWEAVE enables installers, systems integrators and VAR's to build an automated remote alarm monitoring system utilising GSM/GPRS and the Internet. The system provides automated data collection and notification via email and SMS when alarm exceptions are detected. Alarms can be acknowledged and monitored centrally or via a mobile device. The system offers centralised management via the Internet for data logging, alarming, reporting and administration.



Benefits

- Offer a managed service
- No reliance on the end customers network

Applications

- Security and Access Control
- HVAC
- Process Control
- Power and Utilities

Development tools & order information

µWEAVE Starter Kit "Out of the box" M2M

A starter kit is available for the µWEAVE product-set to simplify evaluation and ease design integration. It provides access to µWEAVE software and includes a µWEAVE Gateway with the appropriate accessories for rapid evaluation of the end-to-end system "out of the box". The Starter Kit includes: -

- µWEAVE Gateway
  - GSM/GPRS module
- RS232 board
- Power Supply
- Cell Block Antenna
- 9-way serial cable
- Host 10-way ribbon cable
- Example "C" driver
- µWEAVE Software access
  - Comtech hosted
  - 3-month access
  - Full functionality at site level limited to 1 µWEAVE gateway
- CDROM
- Remote machine PC simulator (Vending)

System Asset Cost Elements

The following elements identify one-off costs to create and tailor the µWEAVE system to your application requirements.

µWEAVE Software Service Set-up
The µWEAVE central management platform template set-up on it's own domain incorporating your company logo and style.

µWEAVE Gateway
The µWEAVE hardware integrated within each remote machine providing connectivity within the end-to-end system.

Optional Consultancy

Comtech offer optional consultancy to aid integration and tailor the system to meet application, market or customised needs.

- System Integration
- Training
- Custom Reports

Operational Service Cost Elements

The following elements identify ongoing service costs to operate and support the µWEAVE system enabling companies to offer onward managed services to their customers.

µWEAVE Support
Fixed annual charge for technical support hotline to problems resolution

µWEAVE Hosting
Monthly charge per application and per unit for hosting µWEAVE on Comtech's IT infrastructure.

µWEAVE Usage and Licensing
Monthly charge per unit (remote machine) for usage and licensing of the µWEAVE application.

SIM's and data services
Comtech offer SIM's enabling data connectivity over the GSM/ GPRS network charged per month per unit.

µWEAVE Products and Services

Order Code	Description
FG0000xx	µWEAVE Software Set-up
FG000092	µWEAVE Gateway 1000 (900/1800Mhz) EUR
FG000093	µWEAVE Gateway 1000 (850/1900Mhz) FCC
Contact Comtech	µWEAVE Annual Support Service
	µWEAVE Monthly Hosting Service
	µWEAVE Monthly Usage and Licensing Service
	SIM's and data services
	Consultancy services

Tools and Accessories

Order Code	Description
FG000096	µWEAVE Starter Kit (900/1800Mhz) EUR
FG000097	µWEAVE Starter Kit (850/1900Mhz) FCC
OEM-GSM-A10	Standard MMCX cellblock antenna
OEM-GSM-A9	Standard MMCX stub antenna

Order Code	Description
GSM-ANT-001	Standard male SMA cellblock antenna
GSM-ANT-002	Standard male SMA stub antenna
GSM-ANT-006	Standard SMA wall-mount dipole antenna
CABLE-004	PCB mount MMXC to female SMA cable

For more information, visit our website www.comtechm2m.com, mail us at sales@comtechm2m.com or call +44 (0)1942 851800

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