Overview
Introducing the μWEBox eRouter family of GSM/GPRS and PSTN Routers specifically designed for machine-to-machine (M2M) applications. This family consists of a range of boxes suited to integration within OEM equipment or adapting existing field-based equipment into an end-to-end system over a Wide Area Network (WAN). μWEBox eRouter enables remote Ethernet devices to communicate over GSM, GPRS or PSTN networks. They are easy to install and configure and provide access to equipment in remote locations without the complexity of using the end customers private network. μWEBox eRouter's have been designed for robust and resilient operation and are housed in a rugged aluminium enclosure. Comtech offer design license and private label branding to meet your product lifetime needs.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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<tbody>
<tr>
<td>μWEBox eRouter GSM/GPRS</td>
<td>Ethernet to GSM/GPRS Router</td>
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<tr>
<td>μWEBox eRouter PSTN</td>
<td>Ethernet to PSTN Router</td>
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GSM/GPRS & PSTN Routers
Tailored for M2M needs

μWEBox eRouter frees equipment from the restrictions imposed by wired LAN connections to drive new business.

How difficult is it for you to gain access to your equipment through your customers LAN infrastructure? The first challenge is getting the agreement to install an “alien machine” on a secure IT network where it can be perceived as a fundamental threat to the security and integrity of the network as a whole. Even with this in place, the installation and maintenance creates additional cost and workload due to the reliance on the end customer and his associated work practises. μWEBox eRouter eliminates these problems by creating a standalone network with wide area access through GSM, GPRS or PSTN. It provides ease of installation to reduce the reliance on the end customer and enables direct access to remote equipment for control and monitoring purposes. With a growing adoption of Ethernet interfaces integrated directly onboard equipment, μWEBox eRouter offers the ability to obtain remote access over GSM, GPRS or PSTN for standalone access or secondary network back up.

Key Features
- GSM/GPRS Option
  - CSD(9K6)
  - GPRS (Class B 4+2 Class 10)
  - On-board SIM Holder
- PSTN Option
  - Bell and ITU V.90 56Kbps
  - V.42 error correction
  - V.42bis data compression
  - RJ11 connector
  - EUR and FCC options
- Ethernet
  - 10B-T, RJ45 Connector
  - Protocols
    - TCP, IP, UDP, PPP, DNS
    - NAT, IP Forwarding
    - DHCP Server, ARP, PING
  - Dial out mode
  - Dial in mode
  - “Always Connected” mode
  - 8-36v PSU, Rugged enclosure

Benefits
- Standalone—Easy access
- Eliminate local wiring
- Reduce customer reliance
- Rapid installation
- Easy to relocate
- Increased profitability
- Ease of connectivity to remote locations
- Rapid Return on Investment
- Fast time to market
- Reduce costs
- Reduce downtime
- Improve customer service
- Ease of upgradability
- Remove fixed restrictions by enabling equipment mobility

Adaptive Modules Ltd - M2M (Machine-to-Machine) Solutions
**Dial out mode**

The router connects Ethernet client devices to a central server via the GSM, GPRS or PSTN Wide Area Networks (WAN) and optionally the Internet. In this mode of operation, multiple client devices may be connected to the LAN port of the remote router. The router will initiate a connection over the WAN upon detecting data from the client devices. It supports a DHCP server to allocate IP addresses to the client devices, which can also be configured to use the router as a DNS server. The router will forward DNS requests on to the server which is negotiated during PPP, and return the responses. Network Address Translation (NAT) is performed between the Ethernet and WAN connection.

**Dial in mode**

In this mode of operation, a central client device is able to dial-up the remote router over the GSM or PSTN network, where an IP address is allocated to it on the Ethernet port. Multiple server devices are supported on the Ethernet port, which can be addressed by the central client device. Network Address Translation (NAT) is obviated and full access to the network is provided as a transparent extension of the central network.

**Always connected mode**

This mode of operation maintains the router in a connected state with the GPRS network such that it is available for incoming connections from other client devices on the GPRS network. This enables a central client application to poll or initiate a call to a single server device connected to the Ethernet port of the router. In addition, multiple client devices can also be connected to the Ethernet port, thereby providing the "Dial in" and "Dial out" capabilities required for the GPRS network. Network Address Translation (NAT) is performed between the routers Ethernet and WAN connection, with IP forwarding supported to allow access to the single server from the WAN.

**About the GPRS Network**

The General Packet Radio Service (GPRS) network is an "always on", private network for data. It uses the existing GSM network to transmit and receive TCP/IP based data to and from GPRS mobile devices. Private IP addresses are typically dynamically assigned within the network to mobile devices. However, Access Point Names (APN’s) provide a gateway route to other networks such as the Internet, WAP services or private corporate networks. Firewalls typically reside at the APN to isolate the public and private networks. IP addresses allocated to mobile GPRS devices are therefore not addressable from outside the GPRS network (e.g. from the Internet) without specialised services or infrastructure.

**Public Internet access to GPRS devices**

The Internet and GPRS networks are designed for client driven applications and are therefore directly supported by the router’s dial out mode of operation. Due to APN firewalls, remote GPRS server devices can only be addressed by a private network solution or via more complex VPN technology.

**Private network access to GPRS devices**

Although client GPRS devices can communicate with ease over Public and Private networks, GPRS server devices require a static IP address. Network Operators offer private APN’s to corporate networks over Leased Lines or VPN’s, where IP address assignment is managed by the customer’s corporate Network e.g. using a radius server. Alternatively, Wireless

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**Applications**

- Postal and Courier services
- Electronic Displays
- Passenger Information
- Security Surveillance
- Access Control
- Transportation
- HVAC
- Telematic Systems
- Industrial Systems
- Environmental Control
- Traffic Systems
- Industrial Automation
- Office Business Systems
  ... Many More ...

Operators in some countries offer private APN’s with static IP address support thereby creating customers their own private network within the GPRS network. These are supported by the routers “Always on” mode of operation.

**Note:** Contact your local Wireless Operator to investigate the options available to you.

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Adaptive Modules Ltd - M2M (Machine-to-Machine) Solutions
Remote Locations
There is an increase in Ethernet adoption as a standard interface for many types of equipment. However, this restricts deployment to locations where there is a local network. Where the location is physically remote or isolated from the local network, this results in loss of connectivity and associated business opportunities.

Problem
The core problem is that there is no local network in place to provide the connectivity. Furthermore, installing a local network is either not feasible or would be expensive due to the isolated nature of the location. Without connectivity, the status of the equipment is unknown and results in costly on-site maintenance visits and inefficient operations.

Solution
The solution is to create a network access point for the equipment using GSM/GPRS or PSTN with the option for connectivity to a local Internet Point of Presence. The µWEBBox eRouter simply extends the Ethernet connection of the remote equipment to the central server or PC over public networks. As a result, this opens new business opportunities, reduces costs, increases profitability and efficiency.

Benefits
- New business opportunities
- Efficient operations
- Reduced costs
- Increased profitability

Applications
- Passenger information
- Traffic systems
- Security surveillance
- Industrial automation

Standalone networks
Where local networks are available, these are not owned or operated by the equipment manufacturer or equipment service provider. Although Ethernet-enable equipment can connect to this local network, access may be denied or restricted to parties outside of the network itself.

Problem
The network is owned by the end customer who operates a firewall between his network and “the outside world” for security purposes. Furthermore, there are dependencies on the end customer to aid installation through wiring and network set up which are often resisted within the IT department. This creates a barrier to sales, an increased cost of ownership to the end customer and reduced profits.

Solution
Creating your own standalone network eliminates the installation and maintenance issues of utilising the customers network. The µWEBBox eRouter provides a public network access point and Internet Point of Presence to gain access to information when it is needed. This reduces the barrier to sales, creates new business opportunities and simplifies the installation and maintenance process.

Benefits
- Rapid installation
- Less dependency on the end customer and their network
- Efficient operations

Applications
- Postal and courier services
- HVAC
- Security and access control
- Electronic displays

Mobile Connectivity
In many cases, equipment is located in mobile environments such as transport, where a wired network “to the outside world” is not possible. Alternatively, equipment may be leased on a short term basis or regularly re-located. In this case, installation with existing networks becomes difficult and expensive.

Problem
Clearly it is not feasible to connect an Internet leased-line to a moving vehicle! Likewise it is not practical to expect an end customer to re-install equipment when moved within a building. Installation costs, particularly where it involves the end customer, are expensive and therefore need to be eliminated where equipment is regularly re-located.

Solution
µWEBBox eRouter enables mobile equipment with dedicated GSM, GPRS and Internet connectivity. There is no burden on the end customer or operator if the equipment is re-located within the building or leased to other customers. It creates a routing gateway that other co-located equipment can share, thereby adding further value.

Benefits
- Reduced installation costs
- Access to mobile information
- Ease equipment relocation
- New business opportunities

Applications
- Leased equipment
- Mobile assets
- Security
- Transportation
Modules, development tools & order information

OEM Modem Modules
Comtech have adopted a Box-Module-Licensed IP philosophy. This provides rapid time to market through a box product with the ability to integrate OEM modules or licensed designs directly into the equipment. Comtech therefore offer wireless and wireline modem modules to adapt OEM equipment to communicate over public communication networks. Each module is footprint compatible offering interchangeability between different types of networks. Modems range from simple modems to provide serial-network adaptation, through to intelligent modems which include TCP/IP protocols and application level features.

<table>
<thead>
<tr>
<th>Order Code</th>
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<tbody>
<tr>
<td>OEM-GPRS-2E</td>
<td>Low power GSM/GPRS Modem Module</td>
</tr>
<tr>
<td>OEM-MODEM-56C2</td>
<td>PSTN Modem Module Family</td>
</tr>
<tr>
<td>EUR-MODEM-24</td>
<td>PSTN Low Speed V.24 Modem Module</td>
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<tr>
<td></td>
<td>Also see the µWEB Lite family of intelligent modem modules</td>
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Starter Kits
Starter kits are available for each µWEBBox eRouter product to simplify evaluation and ease design integration. They contain the eRouter of choice together with the appropriate accessories for rapid evaluation.

Each Starter Kit includes:

- µWEBBox eRouter (GSM/GPRS or PSTN)
- Power Supply
- Cell Block Antenna (GSM/GPRS version)
- Input filter cable
- 9-way serial cable
- Ethernet x-over cable
- PSTN Cable (PSTN version)
- User Guide

µWEBBox eRouter Core Feature Matrix

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<tr>
<td>FR06000211</td>
<td>µWEBBox eRouter GSM/GPRS (ROHS)</td>
</tr>
<tr>
<td>FR06000215</td>
<td>µWEBBox eRouter PSTN (ROHS)</td>
</tr>
<tr>
<td>Call Comtech</td>
<td>µWEBBox eRouter PSTN FCC</td>
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Tools and Accessories

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<tbody>
<tr>
<td>FR06000210</td>
<td>µWEBBox eRouter GSM/GPRS Starter Kit</td>
</tr>
<tr>
<td>FR06000216</td>
<td>µWEBBox eRouter PSTN Starter Kit</td>
</tr>
<tr>
<td>Contact Comtech</td>
<td>µWEBBox eRouter PSTN FCC Starter Kit</td>
</tr>
<tr>
<td>CASE-0013/M</td>
<td>1 off Box Mounting Bracket (inc screw)</td>
</tr>
<tr>
<td>CABLE-027</td>
<td>Input filter cable*</td>
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</tbody>
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* NOTE: This must be used if the unit is powered from a low voltage source

For more information, visit our website www.adaptivemodules.co.uk, mail us at sales@adaptivemodules.com or call +44 (0)1273 248977

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