

EMR *WAN Compact Router for Industrial Ethernet Networks*



A secure access to Ethernet industrial networks making use of the public operator networks



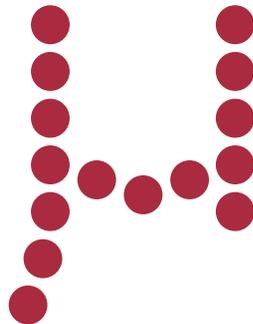
GPRS, Edge, UMTS, HSDPA...a wide range of transmission technologies to accomplish different bandwidth requirements .

Advanced security features to assure service availability and operation reliability.

Easy integration with existing Ethernet devices and networks.

Specifically designed for industrial applications.

μSysCom





EMR



Main Characteristics

Specifically designed for industrial applications

Optional transmission technologies:
GSM/GPRS/Edge
UMTS/HSDPA

Extended temperature range: - 40° to +85°C

Isolated power supply: multi-range AC/DC

Configuration through either local RS232 port or remotely over the air

Advanced security features implemented

Remotely firmware upgradeable

Description

EMR is a compact industrial router for wireless public operator networks. It allows a flexible and secure integration of an existing IP remote network into a corporate Intranet, or an access from the Internet. It also allows remote device integration into existing or new IP networks, just by connecting them to one of the Fast Ethernet Ports available in the EMR.

EMR is configured in a very user friendly way by means of a local connection or remotely, thanks to the integrated configuration web server available.

Due to its industrial orientation, both security and availability are of great importance.

Harsh environments

EMR is a WAN router intended for harsh industrial conditions, exceeding the stringent levels of isolation, immunity and protection.

EMR is the access bridge to an industrial network, and, therefore, it must provide all the security features to avoid unauthorized accesses.

Different models and mechanical enclosures are available in order to adapt to customer needs.

EMR is versatile in bandwidth. For high bandwidth networks, EMR with UMTS/HSDPA WAN interface is available, and for less demanding ones, GPRS /Edge WAN connection can be more accurate.

Due to the importance of security information integrity, EMR incorporates advanced security features, to avoid from of unauthorized accesses.

"Dual SIM" option gives the option to assure service availability, managing WAN connection between different public mobile operators.



EMR allows a SECURE remote LAN interconnection making use of the wireless public networks (GPRS /Edge, UMTS, HSDPA...). These local networks may belong to a single organization, or to different ones.



EMR allows a SECURE access to the devices connected to the router from the Internet.

Human Machine Interface

EMR includes a set of status LEDs both in the front and top pannel. These lighting indicators provide relevant information regarding:

- EMR status
- Ethernet port activity
- GPRS/3G+activity
- WAN Wireless Network status

Configuring EMR

EMR can be configured using either the front RS232 service port or accessing its web-based configuration menu, which resides in the internal Web Server.

RS-232 Configuration

EMR can be configured using its front serial port (SRV). For this purpose, a set of Command Line Interface (CLI) commands is provided. The user just needs to open a HyperTerminal session and all the configuration options will be displayed.

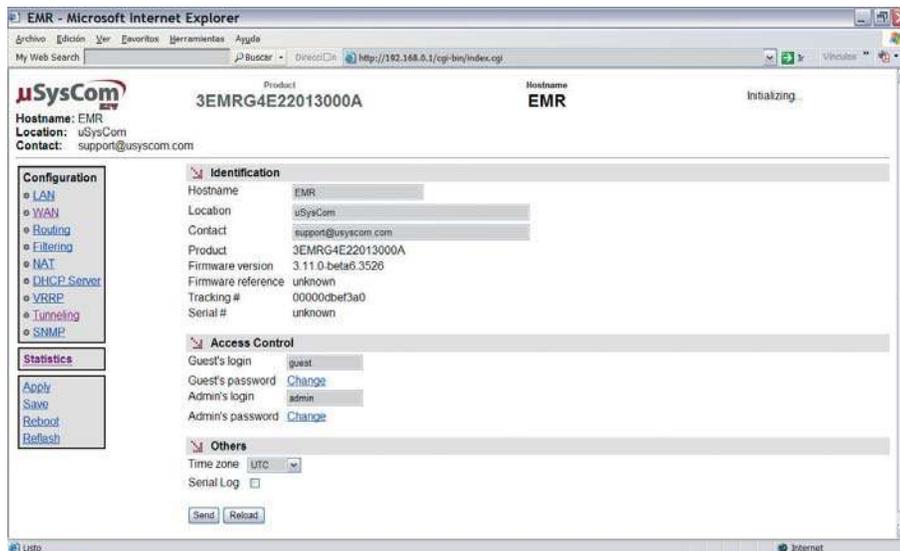
Web Page

EMR integrates a web page which can be accessed either locally (ethernet) or remotely (WAN interface). This page is very user friendly in order to access all EMR configuration parameters.

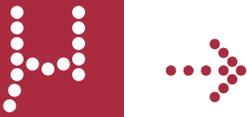
EMR Configuration Parameters

EMR configuration parameters can be grouped into:

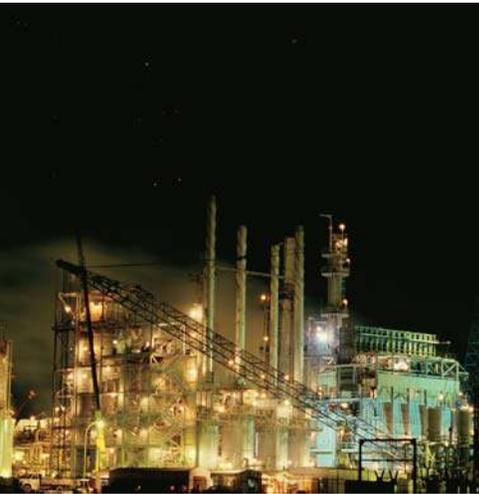
- WAN Interface
- Ethernet Interface (LAN)
- DHCP Server Configuration
- Flexible Filtering Rules Configuration
- Advanced Quality of Service (Layer 2 and 3 QoS)
- NAT (SNAT & DNAT) rules
- IP Routing Configuration Static routing and Dynamic Routing Protocols (RIP, OSPF)
- Tunneling Configuration (IPSec, GRE, IPoIP)
- Statistics & System Monitoring
- SNMP Simple Network Management Protocol
- VRRP Virtual router Redundancy Protocol
- NTP Client configuration
- DHCP Relay
- IGMP Snooping
- Advanced Security Protocols (https, TACACS, Radius, 802.1x...)



User friendly tools
for EMR configuration.



Reliable communications in industrial environments using public communication networks.



EMR makes it possible that industrial equipment benefit from the new packet data services provided by wireless operators. There is an easy integration of any remote TCP/IP network making use of the GPRS/EDGE/UMTS/HSDPA available services.

Remote Access

Accessing remote Ethernet industrial networks via public wireless data services

Wireless Public Operators are adding value to their networks, providing their customers new and competitive data – centric services.

GPRS packet data networks have been deployed during last years. 2004 was the introduction year for 3G (UMTS) mobile packet data services and HSDPA was recently adopted in 2006.

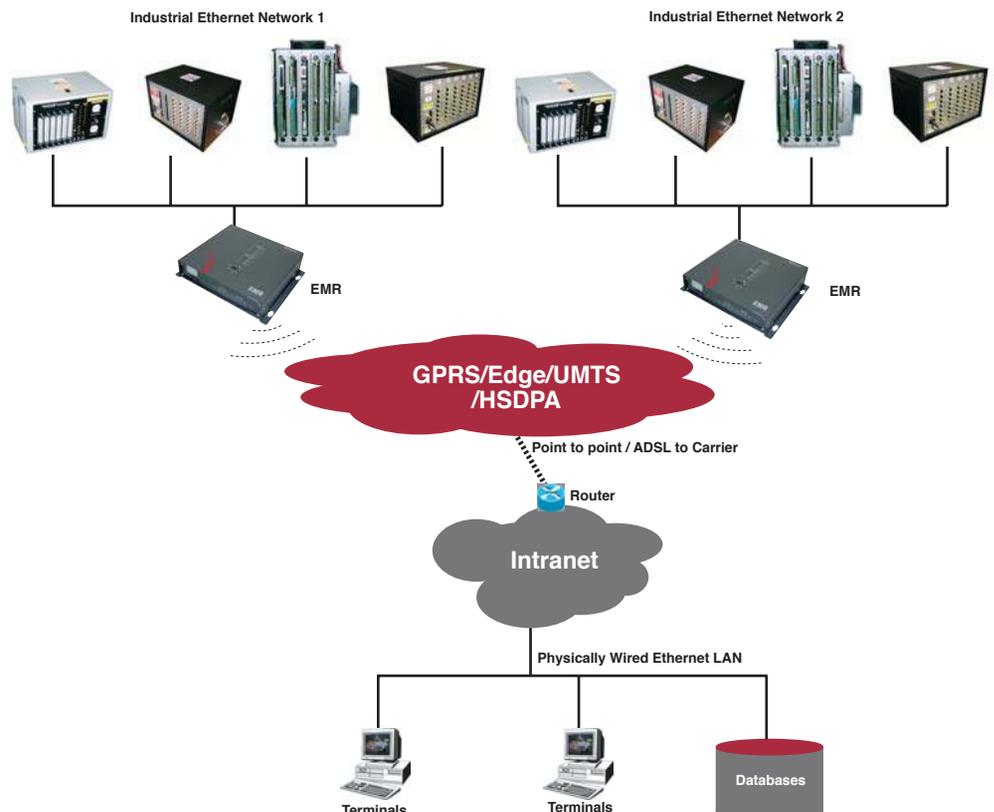
Ethernet is a LAN technology widely adopted in office environments. However, industrial applications are starting to use it, since vertical integration is becoming a key requirement for business success.

uSysCom believes that Ethernet will become a reality in industrial environments, mainly because of its robustness and flexibility. As an example of this trend, note that most of the Programmable Logic Controllers vendors integrate an Ethernet network interface in their equipments.

EMR enables remote LAN/WAN integration making use of the wireless data services (GPRS/3G/3G+based).

EMR allows to connect a remote manufacturing LAN with the central office LAN, achieving a complete vertical integration.

VIRTUAL LAN USING GPRS (Edge) / UMTS / HSDPA NETWORKS



All equipment in a remote site can be integrated into a local network.

Out of Band Control

Infrastructure networks (telecommunications, roads, gas, electricity...) are based on the proper function of different electronic devices spread geographically into different "network nodes".

People in charge of network nodes maintenance are nowadays used to accessing them remotely via a telephone modem. This way they can perform out-of-band control, configuring and monitoring activities. However, this has several drawbacks:

Collaboration is not possible. Only one person can access at a time to the remote network nodes.

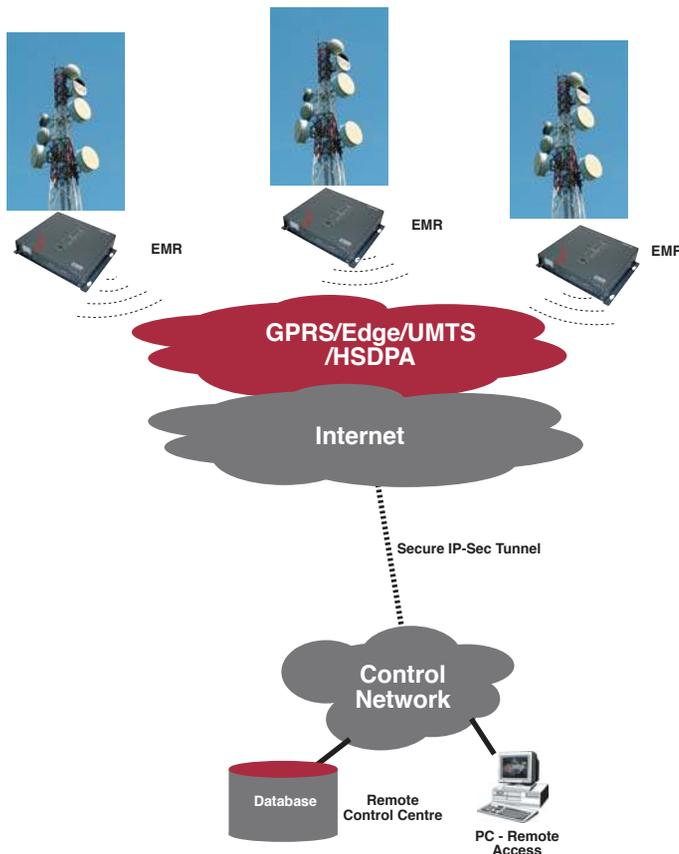
Great configuration efforts are required in both sides, remote and local sites.

Data calls are expensive and potentially unsecure

EMR solves all these problems, allowing a secure access to remote network nodes, making use of the available packet data services (GPRS/3G).

EMR integrates additional features, such as a firewall, or a DHCP server, in order to speed-up installation process.

As a summary, Wireless Packet Data Services can be an optimum solution for those applications that require, either a back-up line for their current telemaintenance solutions, or an out-of-band telecontrol system.



Out of band control allows a secure infrastructure monitoring and configuration access, even when the primary channels are not available.



Industrial companies can also benefit from the new packet data services provided by wireless operators.



Warranty

All products and services sold by uSysCom are warranted against any defect in design, materials and workmanship for a period of two years after of delivery.

Quality

uSysCom owns the quality company certificate ISO 9001-20

From uSysCom, we are highly committed with a Continuous Improvement Plan, following the Total Quality Policies.



Assistance

uSysCom offers a high quality local support service wherever you are. In Spain, Brazil and U.S.A. it is directly offered by ZIV resources. For the rest of the world, there is a local partner network to offer support service.

Additionally, there are different permanent assistance services (24 hours /day, 365 days/year) for immediate support



24 h. Service for Spain and Europe



24 h. Service for Brazil and South America



24 h. Service for U.S.A. and Canada

Technical Characteristics

Mechanical Characteristics

EMR-G/E (Wall Mount): 53 x 249 x 203 mm
EMR-U (Wall Mount): 53 x 249 x 249 mm
EMR (Compact Wall Mount for DUAL SIM): 40 x 126 x 119 mm
EMR (19" Rack Mount): 43 x 442 x 246 mm
EMR (DIN Rail Mount): 45 x 118 x 126 mm

Firmware

Routing functions

Static and Dynamic (RIP, OSPF) routing protocols supported.

IP Aliasing

Allows different subnetworks under a same physical network segment

NAT

IP address and port translation. S-NAT and D-NAT allows translation of both Source and Destination addresses.

VPN-IPSec

IPSec tunnelling for secure connections

IP Firewall

Filtering rules to restrict unauthorized access to EMR.

Failure Detection and Notification

Self test failure detection, and notification via SNMP traps

Traffic Adaptation (Layer 2 and 3 QoS)

Allows bandwidth prioritization for the different devices connected to EMR.

DHCP Server and Relay

EMR assigns can assign a pull of IP addresses to the devices connected to it

IP Traffic Redirection

Allows access from the Internet to the devices connected to EMR

Ping Keep Alive

Security mechanism to continuously monitor WAN connection status

VRRP

Redundancy master-slave protocol to increase availability of the default gateway.

Statistics

Information about LAN and WAN connection status, tunnelling, ...

Power

Options

Wall mount&Rack mount:

- Isolated DC (14-75Vdc)
- Multirange: AC(60-360Vac@47-63Hz) DC(60-260Vdc)

DIN rail mount:

- Non Isolated DC (6-36Vdc)
- Isolated DC (14-75Vdc)
- Multirange:AC(60-260Vac@47-63Hz) DC(60-360Vdc)

Consumption

Normal mode < 2 W
Transmission mode < 5 W

General Data

Quad-Band: GSM 850/900/1800/1900 MHz

GPRS multi-slot class 12

EDGE(E-GPRS) multi-slot class 10

Output power

- Class 4 (2 W) for EGSM850
- Class 4 (2 W) for EGSM900
- Class 1 (1 W) for GSM1800
- Class 1 (1 W) for GSM1900

SIM Card

SIM Card: 3V

Antenna Type

SMA bulkhead female connector.

Data transmission features

- CSD: Circuit switched data; up to 14,4 kbps
- GPRS Class 10 (4+2); up to 85,6 Kbps 12 (Class B). Coding Scheme 1-4
- EDGE/E-GPRS) Multislot Class 10 (Class B). Coding Scheme MCS 1-9
- SMS text/PDU mode
- UMTS/HSDPA

Environmental characteristics

- Operating Temperature: - 40°C to +85°C (excluding PC Card)
- Storage temperature: - 30°C to 75°C (GPRS / EDGE models)

Interfaces

- 4 Ethernet Ports (1 Optional 100BaseFx)
- 1 or 4 Ethernet Ports: 10/100BaseT (RJ45).
- 1 Optional 100BaseFx(MTRJ) port
- RS232 port for configuration



Model selection

Specific model, depending on the required characteristics, can be selected using the following chart:

Transmission Technology

GSM/GPRS

UMTS/HSDPA

EDGE/GPRS

Rear Ports

1 port

4 ports

Rear Ports Connector Type

10/100BaseT: RJ45

1 port 100BaseFX (multimode): MT-RJ

1 port 100BaseFX (singlemode): MT-RJ

Service Port

DB9 RS232

Power Supply

Isolated: DC(20-75 VDC)

AC(60-260VAC@47-63Hz and DC55-360VDC)

AC(50-260VAC@47-63Hz and DC55-360VDC) + Int

Non isolated DC (5VDC)

Non isolated DC(6-36VDC)

Factory Defined

Not used

Basic Software

Isolation

Non-isolated Data Ports

Isolated Data Ports

Enclosure

Wall Mount

Rack Mount

Outdoor IP67

DIN mount

Radio Type

Default (Option PC Card for UMTS & embedded module for GPRS/Edge)

Novatel / Lucent PC Card for UMTS

Huawei PC Card for UMTS

UMTS/HSDPA Embedded module

Dual SIM

Default

Dual SIM

Mounting PC Card

PC Card not mounted

PC card mounted

Factory defined (REV)

Default

		E	
		M	
		R	
		-	
Cod.			
G			
U	→	<input type="checkbox"/>	
E			
Cod.			
1	→	<input type="checkbox"/>	
4			
Cod.			
E			
M			
S	→	<input type="checkbox"/>	
Cod.			
2	→	<input type="checkbox"/>	
Cod.			
0			
1	→	<input type="checkbox"/>	
2			
5			
6			
Cod.			
Q	→	<input type="checkbox"/>	
B			
Cod.			
0	→	<input type="checkbox"/>	
1			
Cod.			
0	→	<input type="checkbox"/>	
1			
Cod.			
0	→	<input type="checkbox"/>	
1			
Cod.			
0	→	<input type="checkbox"/>	
1			
Cod.			
A	→	<input type="checkbox"/>	

Standards and Type Tests

Isulation Test	IEC 255-5
Between Circuits and Ground	2kV, 50/60 Hz - 1 minute
Between Independent Circuits	2kV, 50/60 Hz - 1 minute

Surge Immunity Test	IEC 61000-4-5
Common Mode	4 kV; 1,2/50 μs;0.5 J
Differential Mode	2 kV; 1,2/50 μs;0.5 J

Fast Transient Burst Test	IEC 61000-4-4 Class IV
Power	4 kV±10%
Data	2 kV±10%

Test of Immunity to electromagnetic RF fields	IEC 61000-4-3
Amplitude Modulated	10 V/m
Pulse Modulated	10 V/m

Conducted Electromagnetic Field Disturbance	IEC 61000-4-6
Amplitude Modulated	10 V

Test of Immunity to Electrostatic Discharges	IEC 61000-4-2 Class IV
	15 kV±10%

Radio Frequency Emissivity	EN 55011 Class B, EN 55022 Class B
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Electromagnetic Compatibility	EN 61000-6-2; EN 61000-6-3; EN 61000-6-4
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Temperature	IEC 255-6
Operating Range	-20 °C to +70 °C
Storage Range	-40 °C to +85 °C
Relative Humidity	95% (non condensing)

Power Supply Dips and Interruptions	IEC 61000-4-11
	30% 500 ms
	60% 100 ms
	100% 10 ms

Vibration Test (sinusoidal)	IEC 255-21-1 Class I
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Shock and Bump Test	IEC 255-21-2 Class I
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All the models satisfy the 89/336/CEE electromagnetic compatibility European directive.

