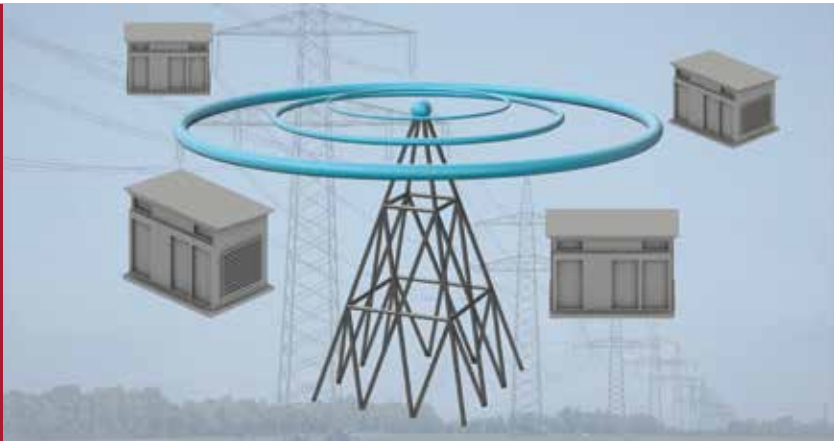# EMR-2

Compact WAN router for Secondary Substations

The **EMR-2** is a **router** specifically designed to provide **layer 3 connectivity** using public wireless networks

The **EMR-2** provides the ability to integrate an existing remote IP network with an Intranet.

The **EMR-2** allows secure access to devices connected to the router from and to the Internet.

The **EMR-2** facilitates the integration of a remote device (host), autonomous or connected in a remote LAN, in an existing or new IP network, in a reliable way.

The EMR-2 can be equipped with three options regarding the cellular interface, **4G (LTE), 3G (UMTS/HSDPA)** or **2G (GSM/GPRS)**, differing mainly in the bandwidth that they can provide to the user, although the interface with UMTS/HSDPA it is also capable of operating in GPRS mode and with LTE it is capable of operating in UMTS/HSDPA or GPRS mode.

The EMR-2 supports the **SNMPv1**, **SNMPv2c** and **SNMPv3** management protocols, as well as other protocols and services such as **DHCP, NTP/SNTP, TACACS+** and **RADIUS**.

Configurations that include an user serial port (two RJ-45 connectors) also incorporate **serial to IP encapsulation** capabilities.

Making the Smart Grid Real

Main Applications

- ✓ Remote access to local networks or to Ethernet devices.
- ✓ Back-up and Alternative Control links.
- ✓ Mobile networks.
- ✓ Secure access to remote data.
- ✓ Video transmission.
- ✓ Connections in remote locations.
- ✓ Serial to IP encapsulation (depending on configuration).

Equipment Interfaces

- ✓ 1 RS-232 or RJ-45 service console (DCE mode).
- ✓ 1, 2, 4 or 6 Fast Ethernet ports type 10/100Base-Tx with RJ-45 connector.
- ✓ 1 wireless GSM/GPRS (2G), UMTS/HSDPA (3G) or LTE (4G) WAN interface with 2 external slots for Mini SIM (2FF) cards.
- ✓ 1 optional port (encapsulation model only) with RS-232/RS-485 (DCE) interface.

Main Facilities

Automatic port speed detection. Static routing information (configured by the user). **Dynamic routing information** (RIP & OSPF routing protocol). **VRRP** redundancy protocol. **NAT** rules. **IPSec** tunnels with DMVPN (Dynamic Multipoint VPN) support. **NHRP** (Next Hop Resolution Protocol). **IPIP** (IP over IP) and **GRE** tunnels. VLANs management per port. The Fast Ethernet ports can have different IP addresses. Filtering. Stateful IP firewall. Assignment of Quality of Service, and **layer 3/4 Quality of Service** management.

STP and RSTP for resolving loops in the network and operation in rings.

Management System

Local and remote access via **console** (115200 bit/s) or built-in **web server** (HTTP/HTTPS), **Telnet** and **SSH**.

Additional Services

- · SNMP v1, v2c and v3 agent.
- · DHCP server and client.
- · NTP/SNTP server and client.
- · TACACS+ client.
- · RADIUS client.
- · FTP/FTPs server.
- · DNS client.
- · DHCP Relay.
- · DNS Relay.
- · PVLAN (RFC 5517).

Technical Information

WAN interface with GPRS (2G)
- Quad band: 850/900/1800/1900MHz.

WAN interface with UMTS (3G)
- UMTS/HSDPA: bi-band, 900/2100MHz.
- GSM/GPRS/EDGE: bi-band, 900/1800MHz.

WAN interface with LTE (4G) - modem Cinterion PLS8E
- LTE: 800/900/1800/2600MHz.
  LTE data up to 100 Mbit/s (downlink) and 50 Mbit/s (uplink).
- UMTS/HSPA+: 900/1800/2100MHz.
  HSPA+ data up to 42 Mbit/s (downlink) and 5.76 Mbit/s (uplink).
- GSM/GPRS/EDGE: 900/1800MHz.

WAN interface with LTE (4G) - modem Telit LE910 EU V2
- LTE: 800/900/1800/2100/2600MHz.
  LTE data up to 150 Mbit/s (downlink) and 50 Mbit/s (uplink). Cat.4.
- UMTS/HSPA+: 900/2100MHz.
  HSPA+ data up to 42 Mbit/s (downlink) and 5.76 Mbit/s (uplink).
- GSM/GPRS/EDGE: 900/1800MHz.

Encapsulation protocols (encapsulation model)
- ✓ IEC 60870-5 101/102/103 (the first two with the variants to support link addresses of 1 or 2 bytes).
- ✓ DLMS, GESTEL, MODBUS, DNP 3.0, SAP20, PROCOME, Pid1, Twc.

Asynchronous data port characteristics (encapsulation model)
- ✓ Data bits: 5, 6, 7 or 8
- ✓ Stop bits: 1 or 2
- ✓ Parity: odd, even or none
- ✓ Speed: from 600 bit/s to 115200 bit/s
- ✓ Flow control: none, hardware or software
- ✓ Interface: V.24/V.28 ITU-T (EIA RS-232C) or RS-485 (2w or 4w)

Mounting
DIN rail (EN 50022, BS 5548, DIN 46277-3)
Dimensions: Height: 67 mm; Width: 220 mm; Depth: 140 mm
Weight: 750 g

Power supply
Multirange Vdc and Vac (38-310 Vdc, 80-260 Vac)
Maximum power consumption at 48 Vdc: 6 W
Maximum power consumption at 230 Vac: 5 W

Temperature range	From -25° C to +70°C
Material	Grey (RAL 7024) Lexan 920 fire-resistant (UL 94 V0) plastic
EMI immunity & environment compliance	IEC 61850-3
	IEC 61000-6-5

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