

# APR410

## The **4G router** to communicate data on broadband network in smart metering systems and smart city

APR410 is a device designed to allow wireless data communication over the **broadband network** and to be installed in secondary substations of the electricity distribution network.

It is a **powerful, programmable and high-performance industrial device** that allows **4G wireless connectivity** with fallback on 2G and 3G networks and the application of multiple strategies to ensure the "Always On" status, including routing / switching.

It offers a high level of immunity from electromagnetic disturbances and, in general, applies safety strategies anywhere: from the use of signed "packages" to allow software remote updating up to local management and maintenance via Ethernet port with protected access and remote maintenance through protected SSH sessions with authentication and encryption.

It also offers the possibility of **connecting other devices** thanks to its Fast Ethernet interfaces.

It is simple to install, boasts mechanical strength and a compact design with reduced dimensions; it does not include moving parts (eg cooling fans), it guarantees high reliability also in terms of duration and resistance in harsh operating environments and at low consumption.

This is the **ideal router** for the smart city!



The 4G APR410 router is the ideal device for remote management, remote control and smart city systems because it performs the tasks of collecting and transmitting data detected by sensors spread over the territory with maximum efficiency and the use of open and standard technologies. It has been designed to ensure minimum bulk and maximum compactness so that it can be easily adapted to environments that are less hospitable both in terms of space and environmental condition.

## TELEMEDICINE



# features that make APR410 unique and indispensable in smart metering and smart city systems

The router is designed with industrial and fan-less components to guarantee high strength. Its case is made of self-extinguishing V0 polycarbonate material.

The SIM card is installed without opening the casing.

APR410 operates at low energy consumption with maximum energy absorption, in any condition, less than 10W; it is powered by DC: 12V ... 24V (-15%, + 20%) and it is immune to a transient voltage reduction from 24V to 12V for 100ms. The power supply is via a polarized and anti-inversion connector, with a retention system.

Dimensions: 130x84x49 mm.

APR410 allows data transmission on 4G / 3G / 2G LTE / HSPA / HSDPA / UMTS / EDGE / GPRS networks; in this regard, it is equipped with a dual antenna (supporting LTE MIMO technology), adjustable and removable via two SMA female connectors.

In addition, the router has a dual 10/100 Mbps Fast Ethernet RJ45 connector, Auto-sensing, Full Duplex, MDIX auto, configurable in switching mode; a rubber cap is also supplied for closing the connector when not in use.

APR410 has a multiple degree of protection against atmospheric agents, compliant and certified according to CEI EN 60529/1997:

- IP51 on the entire cabinet
- IP54 for the SIM place, to guarantee the reliability of the SIM CARD component
- IP22 for the connector areas, located on the lower side of the device.

## SAFETY

- Encryption password
- It is not possible to interrupt the startup sequence of the router (boot uninteruptible)
- CHAP authentication on mobile WAN
- Authentication and Accounting RADIUS / TACACS for local/remote connection to the device
- Safe management of local authentication procedures
- L2/L3/L4 access list to assure access only to authorized users
- Firewall with status
- Ethernet interfaces management according to IEEE 802.1q standard
- Enabling and disabling unnecessary or obsolete services (eg. Telnet, tftp, rlogin, talk- server...) through the configuration file
- Disabling network services when not in use (eg. DNS, DHCP, direct transimission, source routing...) through the configuration file.



## MAIN FEATURES

Command line interface	simultaneous access (over 2 different users with different privileges) via RADIUS/TACACS; local connection;
main commands available	device status; statistics on the physical and logical resources of the devices (eg. CPU, interfaces, routing, protocols, IPsec); real time or buffered debug through different levels of details; disabling the local access remotely; remote disabling of local management interfaces (eg. No HTTPS); enable/disable login to different levels of details
	multilevel security access; SSHv2, HTTPS; sFTP; SNMPv3; Timestamp service; DHCP server/DNS client; Configuring IP Address for the management (eg. RADIUS client) Functionality of firmware update via remote script of the events (log) Events logging

## ALWAYS ON

In order to ensure that the subnet of the substation is always connected to the WAN and reachable from the central system, the APR410 router implements various automated strategies to manage the connection in the long run, without the need for manual interaction.

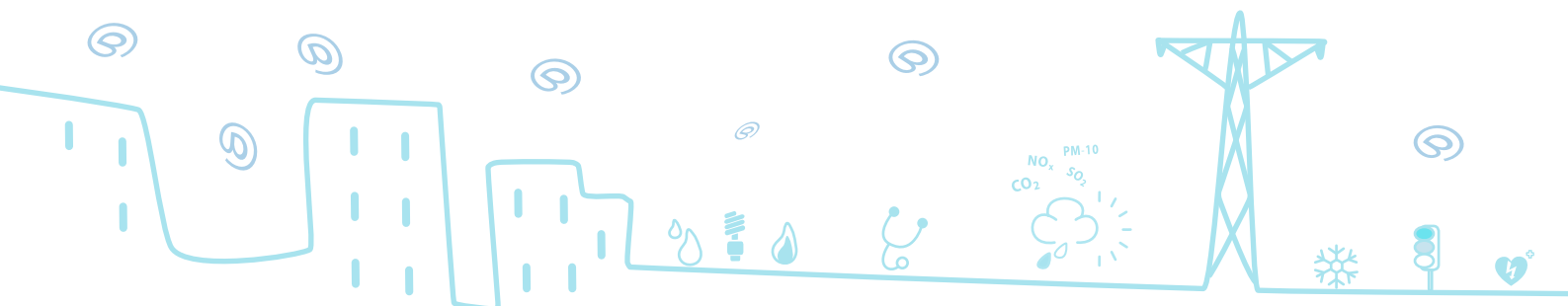
## FIRMWARE UPDATE

The APR410 firmware can be remotely updated.

To perform efficiently and safely this feature as well as the OTA (Over The Air) remote maintenance, the SSH protocol is used that make possible establishing a remote and encrypted session, during which the security and integrity of data transmission is guaranteed.

## CONSOLE

Using the "2" labeled Ethernet port you can turn on a secure SSH session with authentication and encryption to manage the router with a protected login on various levels. During the session you can send console commands to the router in order to configure and manage it. In addition to standard and proprietary console commands there is a series of customized commands.





**RF INTERFACE**

technical specification references	GPRS/EDGE	ETSI TS 100 910 V8.20.0 (2005-11) Digital cellular telecommunications system (Phase 2+); Radio Transmission and Reception
	UMTS/HSDPA	ETSI TS 125 101 V11.9.2 (2014-04) Universal Mobile Telecommunications Systems (UMTS); User Equipment (UE) radio transmission and reception (FDD)
	LTE	ETSI TS 136 101 V13.4.0 (2016-09) LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception
frequency bands	GPRS/EDGE	900-1800 Mhz
	UMTS/HSDPA	band I and band VIII
	LTE	band 1, band 7, band 8, band 20 and band 3.
power class	GPRS/EDGE	power class 4 (2W for GSM 900) power class 1 (1W for GSM 1800)
	UMTS/HSDPA	power class 3 (24dBm for HSPA)
	LTE	power class 3 (23 dBm for LTE)
radiated immunity and radiated emissions	Directive 2014/53/EU of the European Parliament and of the Council of 16th April 2014 on the harmonization on the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.	
BER/BLER measurement	ETSI TS 100 910 V8.20.0 (2005-11) - Digital cellular telecommunications system (Phase 2+); Radio Transmission and Reception ETSI TS 125 101 V11.9.2 (2014-04) - Universal Mobile Telecommunications system (UMTS); User Equipment (UE) radio transmission and reception (FDD) ETSI TS 136 101 V13.4.0 (2016-09) - LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception At room temperature, @ +55°C, @ -20°C and during thermal cycles for a period of 3 hours (-20°C and +55°C): <ul style="list-style-type: none"> <li>• for 2G BLER not higher than 10% after at least 20 measurements;</li> <li>• for 3G BER lower than 1% after at least 100 packets. Reference Measurements Channel 12.2 Kbps;</li> <li>• for LTE throughput ≥ 95% of maximum throughput</li> </ul>	
VSWR	ETSI TS 100 910 V8.20.0 (2005-1) ≤ 2,2	

**RELIABILITY**

temperature range	specified operating range	-25°C ÷ +55°C
	operating range with functional deterioration	-40°C ÷ +70°C
	limit range for storage and transport	-40°C ÷ +70°C
cumulative distribution of errors	F(t=1 year) ≤ 0,3%	
failure rate	$\lambda \leq 3,99 \cdot 10^{-7} \text{h}^{-1} = 0,0035/\text{years}$	
MTTF	1/λ ≥ 285 years	
FIT	≤ 400	
lifetime	≥ 10 years	

**SUPPORTED COMMUNICATION PROTOCOLS**

RFC 791 (IP) RFC 793 (TCP), RFC 768 (UDP), RFC 1006 (ISO transport on TCP)	
TCP/IP protocols	IPv4; IPv6 IPSEC, TLS 1.2 and 1.3 GRE ICMP ARP NTP
routing protocols and network standards	static routing RIPV1, RIPV2 Domain Name System (DNS) Network and Port Address Translation (NAT/NAPT) Port Forwarding VLAN (802.1q)

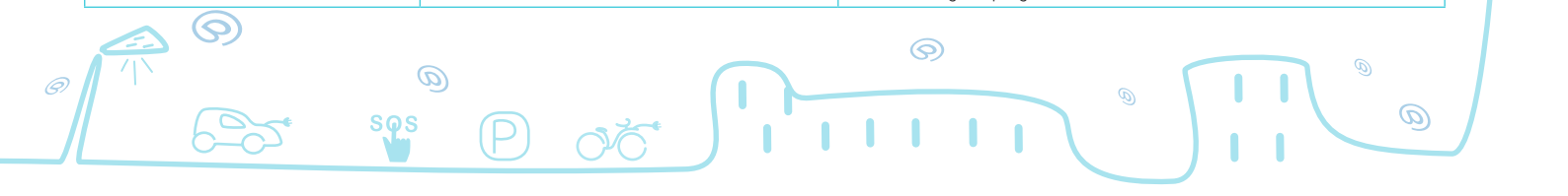
**COMPLETE SET OF ACCESSORIES**

power supply cable	0,75 mm <sup>2</sup> section, > 75 cm length
cable for Ethernet data	CAT 7S-FTP length > 50cm
antennas	2 adjustable orientable multiband SMA antennas

**VISUAL SUPPORTING**

The router is equipped with a series of very bright LEDs that are positioned on the front and provide the following information	power supply device registration on the network type of connection (2G, 3G o 4G) activity status of the PDP context data exchange status network power
	each Ethernet port shows the following LED sign

activation (not locked)  
connection of a device  
data exchange in progress





SMART TECHNOLOGIES

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