Tiesse

Innovation made in Italy®

Smart Grid router series

Imola x272-SGR-IKxW

Smart Grid Router

Fiber Network Access

Datasheet 2024

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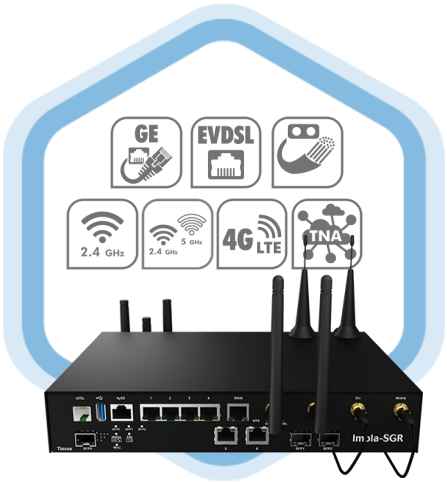


The **Imola S**MART **G**RID **R**OUTER series meets the needs of communication, automation, control and protection of the Smart Grid architecture (for the production, transmission and distribution sector of water, gas, electricity and renewable energy).

The **IMOLA SGR** series router are suitable for industrial environments. They guarantee low absorption power and they are available both with AC or DC power supply.

FEATURES

Imola SGR models fits the evolution of the Imola router series, that are certified and used by the networks of the main telecommunication operators. All Imola routers include the following functionalities:

- Routing
- Switching
- Multi fail-over
- QoS
- Security
- Zero Touch Provisioning

KEY BENEFITS

⇒ Always-on connectivity and service contiuity

⇒ Security

⇒ Easy installation and factory preconfiguration

⇒ SIMs are installed and tested in factory on each device

⇒ Remote management and provisioning

⇒ Scalability

⇒ Multiple backup

APPLICATIONS

Thanks to the possibility to connect via Fiber (active and GPON), ultrabroadband eVDSL and integrated LTE, the Imola SGR routers guarantee **"always on" connectivity** between:

- primary and secondary substations
- towards telecontrol, monitoring and smart metering control centers in cloud.

Models

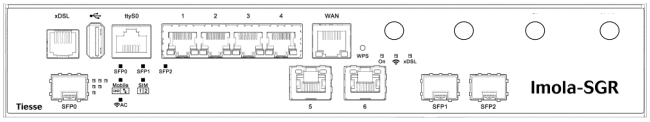
IMOLA 0272-SGR

IMOLA 0272-SGR-IK2W

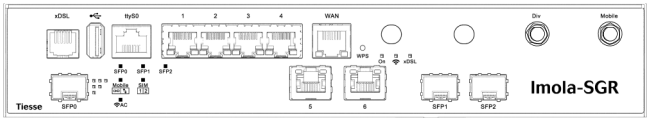
IMOLA 5272-SGR

IMOLA 5272-SGR-IK2W

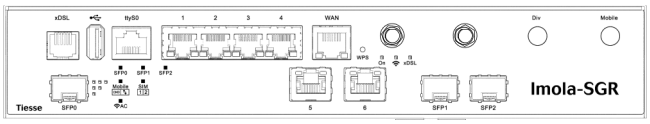
INTERFACES



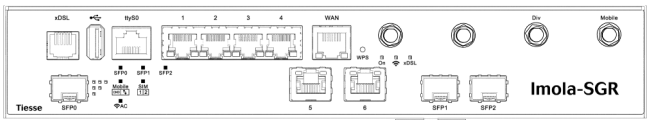
Imola 0272-SGR



Imola 5272-SGR



Imola 0272-SGR-IK2W



Imola 5872-IKF-IK2W

	IMOLA x272-SGR		IMOLA x272-SGR-IK2W	
	0272-SGR	5272-SGR	0272-SGR-IK2W	5272-SGR-IK2W
LAN port - ETH 10/100/1000 Mb Switch	6	6	6	6
Fiber LAN port - SFP cage	2	2	2	2
WAN port - ETH 10/10/1000 Mb	1	1	1	1
WAN port - SFP cage	1	1	1	1
WLAN port - 802.11 b/g/n	1	1	1	1
WLAN port - 802.11 ac	-	-	1	1
eVDSL / VDSL2 /ADSL2+ port	1	1	1	1
4G	-	•	-	•
Console port	1	1	1	1

eVDSL

Support of thenew generation networs (NGN), ensuring:

- Support for VDSL2 profiles: from 8 MHz to 35 MHz in accordance with ITU-T G993.2 Annex Q standard (35b profiles or Vplus) capable of aggregate rates up to 400Mbps
- G.Vector standard-compliant (ITU-T G.993.5)
- ITU-T G.998.4G.INP standard-compliant (impulse noise protection)
- ADSL2 compatible (backward compatibility)

4G

Radio interfaces

- LTE: downlink data rate of 150 Mbps and 50 Mbps uplink*
- DC-HSPA+ (42 Mbps in DL) with fallback
- Support of Multiple Input/Multiple Output (MIMO)
- It is possible to activate and configure two APN simultaneously.

Frequencies

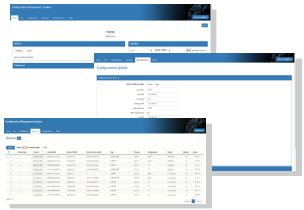
- GSM: 900/1800 MHz
- WCDMA: B1/B5/B8
- LTE-FDD: B1/B3/B5/B7/B8/B20 / LTE-TDD: B38/B40/B41
- LTE/WCDMA: receive diversity

FIBER ACCESS

- Single and/or multiple fiber access for LAN and WAN via optic cables
- GPON connections are supported
- Different types of transceivers supported:
  - max data rate 1000 Mbps (SX,BX, LX, ZX)
  - supported connectors: LC simplex, LC duplex, RJ45

Zero Touch Provisioning

IMOLA routers are integrated in the **TNA (Tiesse Network Architecture)** suite, which is used for the remote and automated management via WEB of the configurations and firmware releases of the installed device park.



INTERFACES

INTERFACCE HARDWARE MODELLI x272-SGR			0272 -SGR	5272 -SGR	0272 -SGR-IK2W	5272 -SGR-IK2W
LAN	**GE**	10/100/1000 Mbps port, RJ45 connector	6	6	6	6
	Wi-Fi	802.11 b/g/n (2.4 GHz) 2x2	1	1	1	1
		802.11 ac (5.0 Ghz) - Only IK2W models	-	-	1	1
	Fiber	SFP Cage for LAN side Fiber connection (SFP module not included)	2	2	2	2
WAN	**GE-WAN**	Combo port GE 10/100/1000 Mbps RJ45 (label WAN) and WAN SFP (SFP0)	1	1	1	1
	SFP WAN	SFP Cage WAN for Fiber and GPON connections (SFP module not included)	1	1	1	1
	ADSL 2/2+ **VDSL2** **eVDSL2**	Full rate ADSL2/2+ / VDSL2 RJ11 - RJ11 connector **ADSL2/2+** – Downstream data rate up to 24 Mbps - Upstream data rate up to 3.5 Mbp – Conformity to the Standard: G.992.1 annex A,B,C&I, G.992.2-g.Lite, G.992.3 annex A, B, I, J, M, G.992.4-g.Lite.bis, G.992.5 annex A, B, C, I, J, M, ANSI T1.413 issue2, ETSI TS 388 – ADSL-over-ISDN, ITU T-I361, ITU T-I.363.5, ITU T-I.432, ITU T-I610, ITU T-I731 **VDSL2** – Support of VDSL2 profiles: 8 MHz to 30 MHz ITU-T G993.2 – Conformity G.Vector (ITU-T G.993.5) standard – Conformity to ITU-T G.998.4 G.INP standard – Compatible to ADSL2 (backward compatibility) **eVDSL2** Support of 35 MHz ITU-T G993.2 Annex Q (profiles 35b or Vplus) profile, with aggregate rate up to 400 Mbps	1	1	1	1
RADIO CELLULAR	**GSM/GPRS EDGE**	Frequency band: 900/1800 MHz GPRS multislot 10, EDGE multislot 12	-	•	-	•
	UMTS / HSDPA / HSUPA / HSPA+	– Frequency band: 900 / 2100 Mhz – HSDPA data rates up to category 20 – HSUPA data rates up to category 6	-	•	-	•
	DC-HSPA+	– 42 Mbps in DL	-	•	-	•
Only 5272 models	**LTE**	– Data rates (category 4, MIMO)* – Peek data rates 150 Mbps DL, 50 Mbps UL *(actual throughput depends on network configuration, bandwidth assigned to the UE, the number of users and the RF signal conditions)* – LTE-FDD: B1/B3/B5/B7/B8/B20 / LTE-TDD: B38/B40/B41 – LTE/WCDMA: receive diversity – WCDMA frequencies: B1/B5/B8 ** category 6 and12 are available on request*	-	•	-	•
CONSOLE		RJ45 connector	1	1	1	1
USB		USB 3.0 port	1	1	1	1

SOFTWARE – Features

Imola SGR routers are supporting all the functionalities needed to use them in Smart Grid mission critical scenarios.

- Execution of event based command
- Dynamic Routing RIPv1, RIPv2, OSPF, BGP support of BFD and VRRP
- Conversion of IEC 61850-101 to 104 and IP Tunnelling IEC 61850-101 (on specific models)
- Precision Time Protocol IEEE 1588
- Traffic management L2 Generic Object Oriented Substation Event (GOOSE) and L2TPv3 (RFC 3931)
- Ring Protocol STP
- QoS Advanced Features, with the possibility to define an arbitrary number of priority clases

Trigger event
RIP - OSPF - BGP - BFD - VRRP
61850-101 vs 104
IEEE 1588
GOOSE-L2TPv3
Ring Protocol
Advanced QoS

PROTOCOLS

NETWORKING

- TCP-UDP IPv4
- ARP ICMP
- IPv4 Path MTU Discovery
- IPv6 support: ICMPv6, IPv6 Path MTU Discovery, IPv6 Neighbor Discovery
- IPv6 Stateless Address Auto Configuration

LAYER 2 features

- LAN Bridging
- VLAN support on LAN interface 802.1q in Access mode, Trunk, native VLAN and Hybrid mode
- Layer 2 Protocol Tunneling (L2PT)
- 802.1Q-in-802-1Q

ROUTING & MULTICAST

- Static, Policy routing, RIPv1, RIPv2; BGP-4, BGP-4+, OSPFv2
- Routing redistribution and tagging
- IGMP v1-v2-v3, IGMP snooping, IGMP proxying
- Multicast routing with PIMv2 sparse-mode and PIMv2 dense-mode, MSDP
- VRRP (Virtual Routing Redundancy Protocol) with IPv4-IPv6 authentication
- IEEE 802.1d (Spanning Tree Protocol)

QoS

- Traffic classification based on source IP, on a combination of source IP, destination IP, protocol (UDP, ICMP, TCP, etc) ports, application recognition, IP Precedence and DSCP
- DiffServ
- Remarking di IP Precedence, DSCP and CoS
- QoS on ATM class
- Shaping with guaranteed allocated bandwith and redistribution of bandwith excess
- Committed Access Rate e Multicast rate Limit
- Mechanisms of traffic prioritization, ability to define an arbitrary number of priority classes
- Link aggregation IEEE 802.3ad

SECURITY

- NAT/PAT
- ACLs, Stateful Firewall
- SSL Tunnelling
- L2TP
- GRE Tunnelling with keep alive and key sequence numbering (radio mobile network optimization)
- VPN with IPSEC/ESP or IPSEC/AH IKEv1/ IKEv2

SERVICES

- DHCP client, DHCP server with antispoofing functions, DHCP Layer Discovery Protocol IEEE 802.1ab, DHCP relay
- Intelligent DNS Proxy, local and remote
- Traceroute
- NTP Client and Server support
- Easy VPN
- DDns

MANAGEMENT AND CONFIGURATION

- SNMP v1, SNMPv2, SNMPv3
- Telnet server with multiple simultaneous sessions
- SSH server with multiple simultaneous sessions (SSHv2)
- Netflow
- IP SLA support for: One Way Delay, Round Trip Delay, Jitter, Packet Loss
- Fault management Syslog /Trap
- Radius Support, TACACS+
- Tracking for backup management, commands and scheduled events
- Software update via TFTP and FTP
- Configuration via command Line Interface (CLI), Text/Menu oriented and Telnet
- TNA (Tiesse Network Architecture) suite for auto-provisioning and remote automated management
- Management of an arbitrary number of configurations

HARDWARE FEATURES

POWER	AC/DC (internal Universal 100-240 VAC) Optional: DC/DC 12V or DC/DC 24V-48V version Power Switch ON/OFF
CONSUMPTION	< = 12W (Full configuration)
ENVIRONMENT	**Operating temperature**: –25° C / +70° C (96 hours) –40° C / +70° C (4 hours) **Storage temperature**: –40° C / +70° C **Max operating humidity**: 93% (non condensing)

LED INDICATORS

Status LED	1 x power / operative status
Ethernet	2 x operative status - for each port
SFP	1 x operative status - for each port
xDSL	1 x connection status
Wi-Fi	1 x 2.4 GHz radio signal activity 1 x 5 GHz radio signal activity (IK2W models only)
Radio cellulare	1 x radio cellular connection status 1 x radio cellular data exchange activity 1 x operational SIM

PROCESSOR	Dual CORE 1 GHz
MEMORY	DRAM 256 MB DDR3
FLASH MEMORY	256 MB

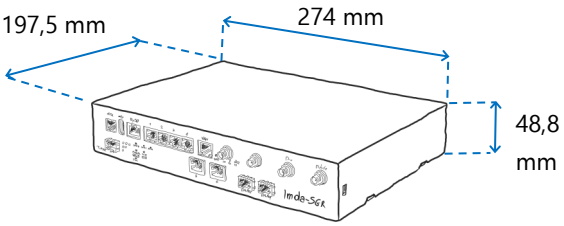
EXTERNAL FEATURES

Material	Metal - black
Antennas	**Radio WLAN** 2 external removable antennas for models which have Wi-Fi b/g/n 5 external removable antennas for IK2W models SMA male connectors
Mounting	Horizontal plane Rack mouting available via optional kit

4G ANTENNAS

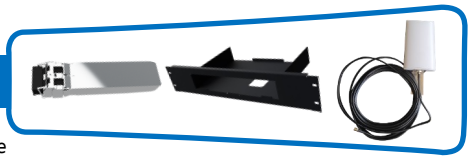
- Support OF Multiple Input/Multiple Output (MIMO)
- 2 removable antennas, SMA male
- Outdoor high gain antenna available on request, both omnidirectional and directional

SIZE



STANDARD WEIGHT	1900 gr ±10%

ADD-ONs



Accessories add-ons are optionally available, like SFP modules, omnidirectional or directional antennas (indoor and outdoor - only for cellular models) as well as rack mounting kits.

Please, refer to the specific documentation available on our website www.tiesse.com.

TECHNICAL SUPPORT

Tiesse provides the user with two sites that are constantly updated:
Support.tiesse.com: the site with technical documentation, assembly instructions, software updates, and how to request technical support.
Wiki.tiesse.com: the site with manuals, instructions for installation, case studies, scenarios, FAQs, etc.

Tiesse
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Tiesse is a 100% italian company which has more than 20 years of expertise in designing, developing, and manufacturing M2M/IoT and network devices. The products series **IMOLA**, **LIPARI** and **LEVANTO**, which are innovative, competitive and certified, are present in the largest distributed national networks (from gas stations to large retailers, insurance companies and banks)

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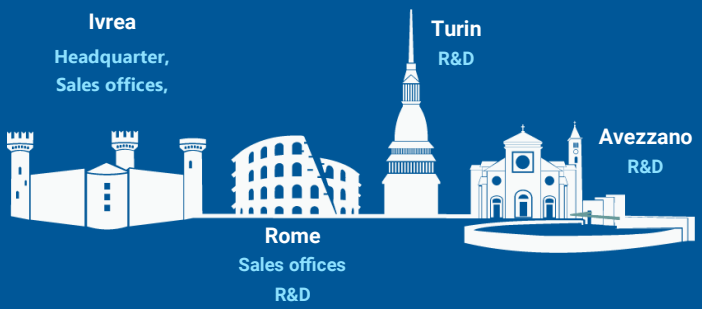

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