Tiesse
Innovation made in Italy®

Imola
Router series

Imola
x872-IKF-IKW

GE
EVDSL
FIBER
4G LTE

Datasheet

WWW.TIESSE.COM

Imola x872-IKF-IKW

Ultrabroadband router
Fiber - eVDSL - Wi-Fi - LTE

SERIE IMOLA X872

Imola x872 series is an innovative line of routers with ultra broadband VDSL Enhanced and fibre connectivity, with 14 Ethernet ports (of which 5 Gigabit and 9 Fast Ethernet), Wi-Fi connectivity and cellular radio in one device.

Thanks to the optional mounting kit, all products in the Imola x872 series become **rack-mountable**.

ALL-IN-ONE

FTTC, FTTH, FWA, 4G/5G, in a single device for reliable, versatile and scalable connectivity. Our Imola series devices are adaptable to any technology and include the features

- Routing & switching
- QoS

KEY FACTORS

Secure by design
Right from the design phase for robust and natively secure solutions.

Always-On
Stable connections anywhere, with multiple links, transparent backup, and quality of service for uninterrupted business.

Certified
Validated for inclusion in business offering profiles and use within the networks of major telecom operators.

Rugged and carrier grade
Designed to withstand and operate for long periods in industrial and disturbed environments. Carrier grade reliability.

Smart value
Maximizes business value with an excellent performance-to-price ratio.

Zero Touch Provisioning
Zero Touch Provisioning facilitates remote management and agile configuration of the installed base.

Eco-efficient
Minimal consumption, lower environmental impact and higher operating cost savings.

Factory pre-configurations
Receive your product pre-configured according to your specific case.

100% factory-tested
We test all our equipment, including SIM cards for models with a cellular radio connection.

IMOLA x872-IKF-IKW models

The Imola x872-IKF-IKxW models include the features described in this datasheet in a robust, all-in-one device and are distinguished by the presence of the 4G radio cellular connection:

- 8 Fast Ethernet ports
- 5 Gigabit Ethernet ports
- 1 eVDSL port
- 1 fiber port
- Wi-Fi b/g/n
- 1 4G cat. 4 port
- 2 SIM slot for backup link
- Zero Touch Provisioning
- Rack-mountable with optional kit

IMOLA 0872-IKF-IKW

Model without radio cellular connection

IMOLA 5872-IKF-IKW

Model with radio cellular connection

BACKUP: high availability mission critical

Seamless backup

The user does not perceive service interruptions and the transition to backup.

Transitions from normal to backup mode and vice versa are performed considering the operational costs.

Multiple Backup

A pair of routers in VRRP performs physical backup of both the network and hardware.

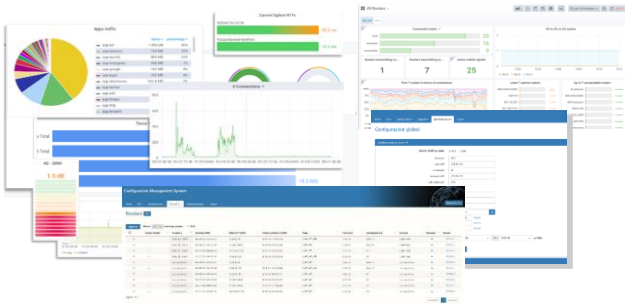
Homogeneous Backup

A single router integrates all ports, wired and mobile.

Heterogeneous backup

An installed base can be upgraded by adding a mobile router and using the VRRP (Virtual Router Redundancy Protocol).

ZERO TOUCH PROVISIONING



Tiesse's router are integrated in the **TNA (Tiesse Network Architecture)** suite.

TNA is the modular software suite that enables Zero Touch Provisioning network architecture, including monitoring, remote and automated web-based management of configurations and firmware releases of the installed fleet; it enables traffic engineering, network overlays, and many other functionalities.

A complete datasheet of the solution is available at www.tiesse.com.

SUGGESTED SCENARIOS AND APPLICATIONS

ISP & Telco Ready
Designed to meet the requirements of service providers, telecom operators, carriers, and system integrators.

Backup and redundancy on multiple links
Optimised products for ultra-connected branches and remote locations

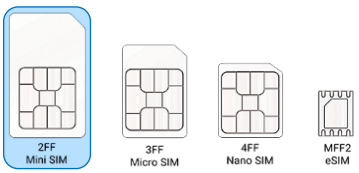
Service continuity and Mission Critical applications
Business applications requiring always-on links and quality of service

HARDWARE INTERFACES

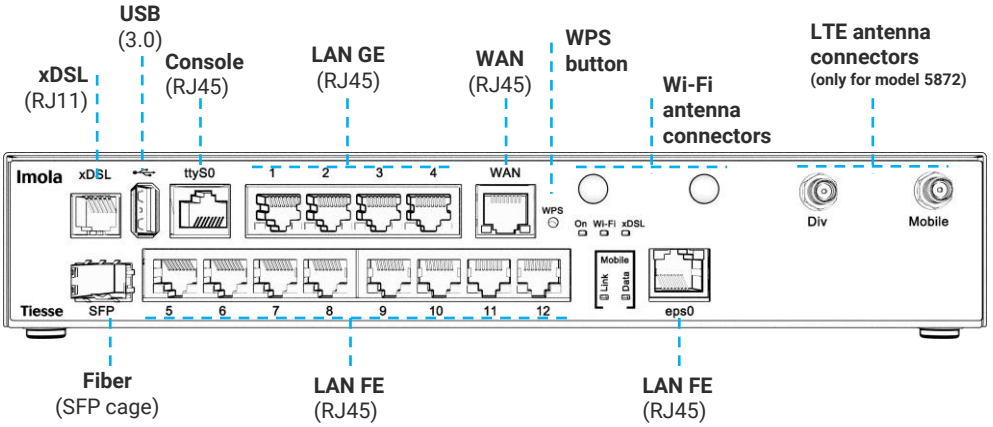
Port	N°	Type	Details
LAN	9	**FE**	10/100 Mbps
	5	**GE**	10/100/1000 Mbps
	1	**Simultaneous Wi-Fi**	- 802.11 b/g/n port (2.4 GHz) 2x2, up to 300 Mbps - 2 removable antennas, SMA male connector, located on the front of the product
	1		- 802.11 ac (5.4 GHz), up to 1300 Mbps - 2 removable antennas, SMA male connector, located on the rear of the product
WAN	1	**GE**	10/100/1000 Mbps WAN, RJ45 connector (WAN labels)

	1	**Fiber**	- SFP port for WAN access with fibre optic cable
			- GPON connection support
			- Support of different models of SFP transceiver modules (not included)
			  - Maximum data rate 1000 Mbps (SX, BX, LX, ZX)
			  - Supported connectors LC simplex, LC duplex

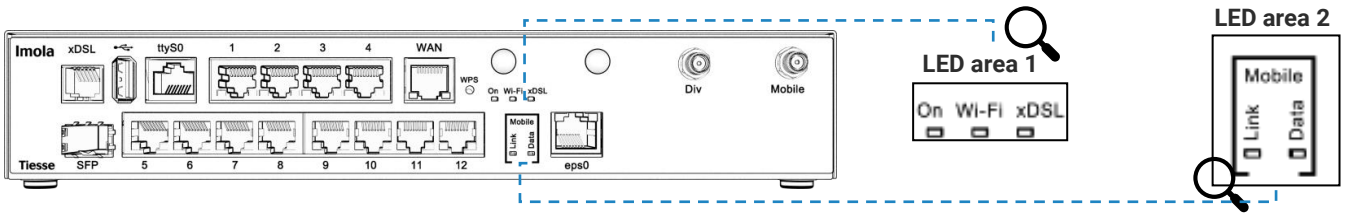
	1	**xDSL**	Full rate ADSL2/2+ / eVDSL
		ADSL2/2+	- Downstream data rate up to 24 Mbps and upstream data rate up to 3.5 Mbps - Compliant with Standard G.992.1 annex A, B, C & I, G.992.2-g.Lite, G.992.3 annex A, B, I, J, M, G.992.4-g.Lite.bis, G.992.5 annex A, B, C, I, J, M, ANSI T1.413 issue2, ETSI TS 388 - ADSL-over-ISDN, ITU T-I361, ITU T-I.363.5, ITU T-I.432, ITU T-I610, ITU T-I731
		VDSL2	- Support for all VDSL2 profiles: 8 MHz up to 30 MHz ITU-T G993.2 - Compliant with G.Vector standard (ITU-T G.993.5) - Compliant with ITU-T G.998.4 G.INP standard - Compatible with ADSL2 (backward compatibility)
		eVDSL	- Support for all VDSL2 profiles: 8 MHz up to 35 MHz, in compliance with ITU-T G993.2 Annex Q (35b or Vplus profiles), capable of aggregate rates of up to 400Mbps - G.Vector support (ITU-T G.993.5) - Compliant with ITU-T G.998.4 G.INP standard (impulse noise protection) - Compatible with ADSL2 (backward compatibility) - Excellent connection stability in case of line disturbances
RADIO CELLULAR (just on 5872 models) **NOTE: the throughput value depends on the network configuration, assigned bandwith, number of users and RF signal conditions.*	1	**GSM / GPRS / EDGE**	- Frequency band: 900 / 1800 / 1900 MHz - GPRS multislot 10 - EDGE multislot 12
		UMTS / HSDPA / HSUPA / HSPA+	- WCDMA frequency bands: 900 / 2100 Mhz - HSDPA data transmission rate up to category 20 - HSUPA data rates up to category 6 - HSPA+ data rate: 21.1 Mbps in Downlink and 5.7 in Uplink - Dual Carrier HSPA mode support
		DC-HSPA+	42 Mbps in download
		LTE	- **Model with LTE cat.4 modem** - Frequency bands: 800 / 900 / 1800 / 2100 / 2600 Mhz - Data rate: Category 4, MIMO* - LTE data rate: 150 Mbps in Downlink and 50 Mbps in Uplink - Two APNs can be configured and activated simultaneously - **Model with LTE cat.6 modem** - Optional version on request
	2	**ANTENNAS**	- 2 removable antennas, male SMA connector, on the front of the product - Multiple Input/Multiple Output (MIMO) support - Outdoor version antennas (omni-directional and directional), high-gain and vandal-proof (optional) also available
	2	**SIM**	- 2 mutually exclusive mini SIM card slots - One internal and one external access slot



HARDWARE INTERFACES



LED DESCRIPTION



LED	Color	Position	Details
Power	**Green**	Led area 1	Operational status of the product power supply
Wi-Fi	**Green**	Led area 1	Wi-Fi b/g/n (2.4 GHz) operative status
xDSL	**Green**	Led area 1	xDSL connection operational status
LAN	**Yellow**	On LAN ports	One for each ETH port, operational status of the 1Gbps connection
	Green	On LAN ports	One for each ETH port, operational status of the connection up to 100Mbps
Radio Cellular (only on 5872)	**Green**	Led area 2	Link: radio cellular connection operational status
	Green	Led area 2	Data: radio cellulare connection data activity

MONITORING AND PERFORMANCE MEASUREMENT FUNCTIONALITIES

IP SLA / Active Probing support for quality measurements

- One-Way Delay
- Round-Trip Delay
- Jitter
- Packet Loss

Active measurement of link quality using test packages

- BFD – Rapid detection of connectivity faults
- ICMP Echo / Ping – RTT and reachability
- UDP/TCP Probe – Verification with real transport protocols
- HTTPS Probe – Application service availability check
- TWAMP/OWAMP – Standardised measurement of delay, Jitter and loss

Data collection and supervision

- SNMPv2/v3 – Polling and status traps
- Syslog – System event and alarm logs
- NetFlow / IPFIX – Traffic flow analysis
- TNA MOS Tiesse

SOFTWARE

Note: the following list is purely indicative, active features depend on version and software update (NOS).

NETWORKING	- TCP-UDP IPv4 - IPv6
LAYER 2	- LAN Bridging - VLAN on802.1q LAN interfaces 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 - VRF Lite, Routing redistribution and tagging - IEEE 802.1d (Spanning Tree Protocol) - VRRP (Virtual Routing Redundancy Protocol) with IPv4-IPv6 authentication - IGMP v1-v2-v3, IGMP snooping, IGMP proxying - Multicast routing with PIMv2 sparse-mode and PIMv2 dense-mode, MSDP
QoS	- Traffic classification based on source IP, destination IP, protocols (UDP, ICMP,TCP, etc.) and ports, and their combinations, on application recognition, on IP Precedence and DSCP - DiffServ - Remarking of IP Precedence, DSCP and CoS - QoS on ATM classes - Shaping with guaranteed bandwidth allocation and redistribution of excess bandwidth - Committed Access Rate and Multicast rate limit - Traffic prioritisation mechanisms, definition of an arbitrary number of priority classes - IEEE 802.3ad link aggregation
SECURITY	- NAT/PAT - ACLs, Stateful Firewall - SSL Tunnelling - L2TP - GRE Tunnelling with keep alive and key sequence numbering (cellular network optimisation) - VPN with IPSEC/ESP or IPSEC/AH IKEv1/IKEv2
SERVICES	- DHCP client, DHCP server with anti-spoofing 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 & 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 - Syslog /Trap fault management - Radius, TACACS+ support - Tracking for management of backups, commands and scheduled events - Software update via TFTP, FTP, sFTP, HTTP, HTTPS, SCP - Configuration via Command Line Interface (CLI), Text/Menu oriented and Telnet - TNA (Tiesse Network Architecture) suite for self-provisioning and automated remote management - Management of an unlimited number of configurations

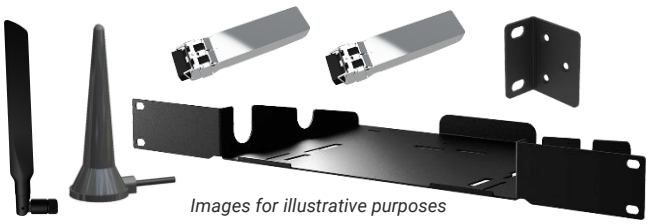
SYSTEM FEATURES

PROCESSOR	RISC Network processor
MEMORY	DRAM 256 MB
FLASH MEMORY	256 MB
CHASSIS	Metal material, black color
FORM FACTOR	Desktop Rack (optional kit)
Wi-Fi ANTENNAS	2 external removable antennas on the back SMA male connectors
4G ANTENNAS	2 external removable antennas on the front SMA male connectors

ADD-ONS

Optional accessories such as antennas for both indoor and outdoor omnidirectional and directional installations, SFP transceiver modules and rack-mount kits are available.

Please check the add-ons datasheets, which can be downloaded from www.tiesse.com.



Images for illustrative purposes

OTHER INFORMATION AND SUPPORT

SUPPORTO.TIESSE.COM

- Technical documentation, installation instructions, quick start guide, first access data
- Firmware updates
- Declaration of conformity EMC, RED, RoHS, ...
- Technical support request
- End of sale and end of product support information
- Warranty repair and product reconditioning

WIKI.TIESSE.COM

- Website dedicated to software documentation
- User manuals
- First access guides
- Case studies, tutorials and other useful resources for product use

PRODUCT IMAGES

Imola 0872-IKF-IKW

Imola 5872-IKF-IKW

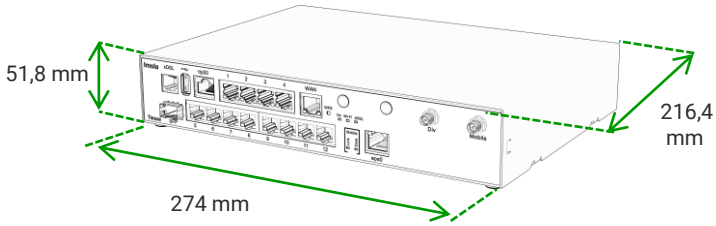
SUSTAINABILTY

SYSTEM

Power	- Internal 100-240 VAC (IEC socket) - On/Off button
Power (optional version)	DC/DC converter with extended input range (18-75Vdc)
Cooling	Fanless
Consumption (full functions)	- Imola 0872-IKF-IKW: ≈ 11,5W - Imola 5872-IKF-IKW: ≈ 12W
EEE (Energy-Efficient Ethernet)	Tiesse products comply with the EEE (802.3az) standard, which saves energy by automatically switching off Ethernet ports when not in use.
Dynamic Power Scaling	Tiesse products use control mechanisms to automatically reduce power consumption by lowering the CPU clock frequency when the load is low.
Mean Time Between Failure (MTBF)	- Imola 0872-IKF-IKW: 330427 hours - Imola 5872-IKF-IKW: 317112 hours

ENVIRONMENT DATA

Operating temperature	–25° C / +70° C (96 hours)
Storage temperature	–40° C / +70° C
Maximum relative operating humidity	93% (non condensing)
Protection grade	IP40



SIZE and WEIGHT - Imola 0872-IKF-IKW

Machine body	274 x 210,4 x 51,8 (W x D x H mm)
Total weight	≈ 2280 gr (maximum weight including packaging and accessories)
Product	≈ 1820 gr
Accessories	≈ 290 gr
Packaging	≈ 170 gr

SIZE and WEIGHT - Imola 5872-IKF-IKW

Machine body	274 x 216,4 x 51,8 (W x D x H mm)
Total weight	≈ 2440 gr (maximum weight including packaging and accessories)
Product	≈ 1850 gr
Accessories	≈ 415 gr
Packaging	≈ 175 gr

OTHER INFORMATION

Packaging and wrapping	The packaging material of this product is ≈88% paper/cardboard, and the incidence of plastic packaging is 12% or less.
	100% of the packaging material is recyclable
RAEE waste	For the correct disposal of Waste Electrical and Electronic Equipment (WEEE), pursuant to Article 26 of Legislative Decree No. 49 of 14 March 2014 'Implementation of Directive 2012/19/EU': contact raee@tiesse.com

Tiesse

Innovation made in Italy®

Tiesse is a totally Italian company with more than 25 years of experience in the design, development and production of network equipment and IoT devices, suitable for use in mission-critical and industrial scenarios. Tiesse's most successful series, Imola, Lipari and Levanto, are innovative, competitive and certified, and are present in the networks of the major telecommunications operators, in the energy sector, large-scale distribution and vertical sectors, both in the Italian and foreign markets.

Further information on Tiesse solutions can be found on the company website www.tiesse.com.

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