

Tiesse

Innovation made in Italy®



M2M/IoT catalogue

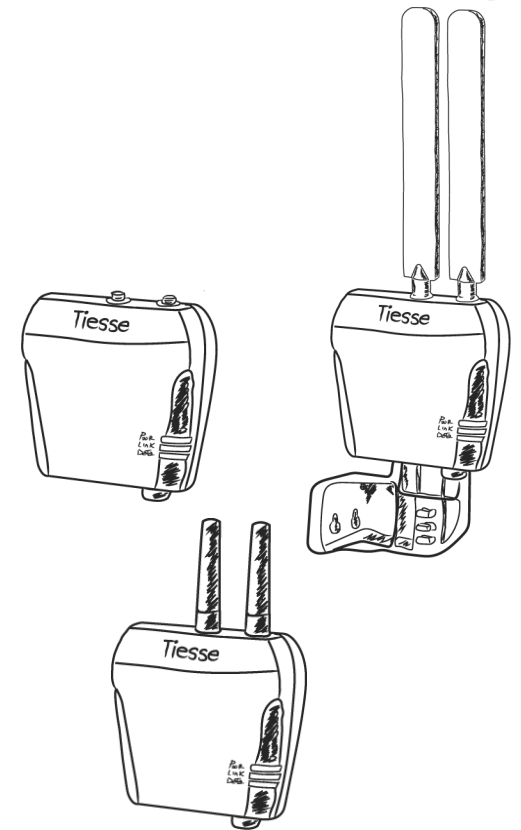
Levanto, KIOTO, TGR series

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Levanto series



Levanto series

Telecontrol, smart metering and industrial applications



Cellular routers for M2M/IoT applications

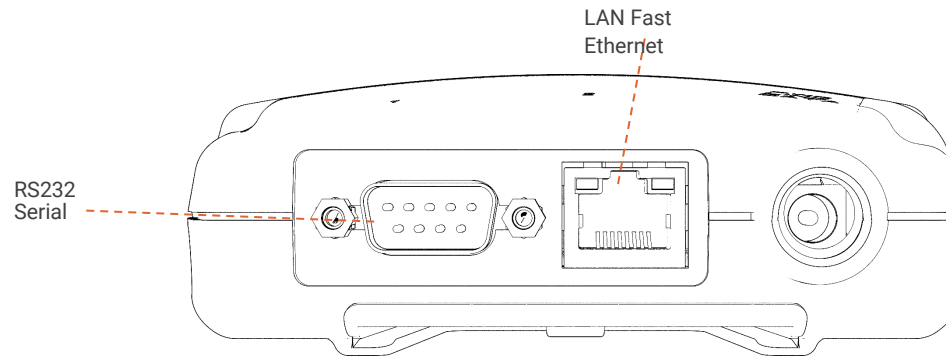


Levanto series

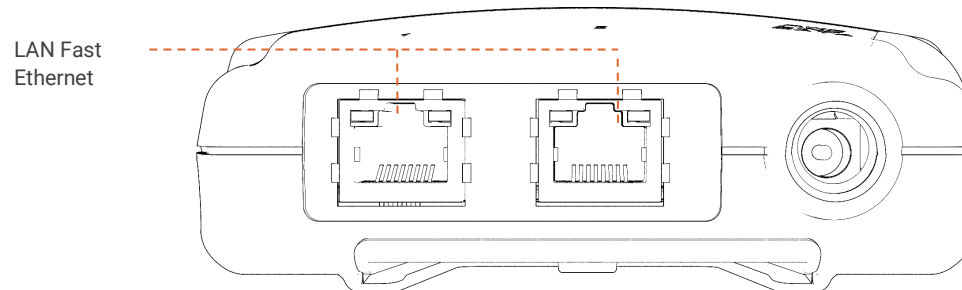
Levanto 520 is particularly suitable for business applications in the industrial and energy sectors, where safety and continuity of service are of primary importance, as well as reliability and durability for installations in noisy environments.

It is designed to meet the requirements and needs for the following applications:

- ⇒ Smart Metering
- ⇒ Remote assets monitoring and management
- ⇒ Remote telereading
- ⇒ Remote telecontrol
- ⇒ Environmental monitoring
- ⇒ Smart City
- ⇒ Industry 4.0



Levanto 510



Levanto 520
Levanto 520-D

Cellular Routers - Levanto series

Telecontrol, smart metering and industrial applications

- Levanto 510
- Levanto 520
- Levanto 520-D

Hardware FEATURES			510	520	520-D
LAN	FE	– 10/100 Mbps ports, RJ45 connectors	1	2	2
	SIM	– SIM slot number	1	1	2
RADIO CELLULAR	Frequency and throughput	– Up to LTE cat. 4	•	•	•
	Bands	– EU region	•	•	•
		– LATAM region	-	•	•
SERIAL		– DB Asynch port up to 115.2 Kbps It allows the use as COM Modem (via AT command)	1	-	-

RADIO INTERFACE	EU REGION	LATAM REGION
FREQUENCY BANDS	<ul style="list-style-type: none"> – LTE FDD: B1/B3/B7/B8/B20/B28 – WCDMA: B1/B8 – GSM: B3/B8 	<ul style="list-style-type: none"> – LTE FDD: B1/B2/B3/B4/B5/B7/B8/B28/B66 – LTE TDD: B40 – WCDMA: B1/B2/B4/B5/B8 – GSM: B2/B3/B5/B8
LTE	– LTE FDD: 150 Mbps (DL) - max 50 Mbps (UL)	– LTE FDD: 150 Mbps (DL) - max 50 Mbps (UL)
UMTS	<ul style="list-style-type: none"> – DC-HSDPA: max 42 Mbps (DL) – HSUPA: max 5.76 Mbps (UL) – WCDMA: max 384 Kbps (DL) - max 384 Kbps (UL) 	<ul style="list-style-type: none"> – DC-HSDPA+: max 21.1 Mbps (DL) - max 5.76 (UL) – WCDMA: max 384 Kbps (DL) - max 384 Kbps (UL)
GSM/EDGE	<ul style="list-style-type: none"> – EDGE: max 296 Kbps (DL) - max 236.8 Kbps (UL) – GPRS: max 107 Kbps (DL) - max 85.6 Kbps (UL) 	<ul style="list-style-type: none"> – EDGE Supports multi slot class 12 Supports GMSK and 8-PSK for different Modulation and Coding Scheme . Uplink coding scheme MCS 1-9 Max 296 Kbps (DL) - max 236.8 Kbps (UL) – GPRS: Supports multi slot class 12 Coding scheme : CS 1-4 Max 85.6 Kbps (DL) - max 85.6 Kbps (UL)

SYSTEM FEATURES		
POWER	Power supply	9-30 Vcc AC/DC 12V power adapter available
	Consumption	< 3 W
ENVIRONMENT	Operating temperature	-25° C / +55° C
	Operating limit range	-40° C / +70° C
	Storage temperature	-40° C / +70° C
	Max operating humidity	93% (non condensing)
PROCESSOR		ARM up to 400 MHz
MEMORY	DRAM	128 MB
	Flash memory	256 MB

EXTERNAL HARDWARE FEATURES		
HOUSING	Material	<ul style="list-style-type: none"> – Chassis in self-extinguishing polycarbonate V0 – Color “papyr white”
	Dimensions (W x H x D)	122 x 109 x 42,4 without antennas
ANTENNAS	Radio cellular	<ul style="list-style-type: none"> – External removable antennas, SMA male connector – Support for external antennas both directional and high gain omnidirectional connectable via cable with SMA male connector (optional)
MOUNTING	Form factor	<ul style="list-style-type: none"> – DIN rail mounting - optional bracket – Wall mounting - optional bracket
	Status LED	– 1 x power / operational status
LED	Radio cellular	<ul style="list-style-type: none"> – 1 x radio cellular link status – 1 x radio cellular data connection activity

Cellular Routers - Levanto series

Telecontrol, smart metering and industrial applications

- Levanto 510
- Levanto 520
- Levanto 520-D

SOFTWARE FEATURES

Note: the list below is purely indicative; the features depend on the product model and on the NOS release.

NETWORKING

- IPv4, IPv6
- TCP
- UDP
- ICMP
- ARP
- 801.q (VLAN)

ROUTING

- Static routing
- Dynamic routing protocols RIPv1, RIPv2, BGPv4

SERIAL INTERFACE

- Allows to use LEVANTO as COM Modem (AT command interpreter)

SECURITY

- Non interruptable boot
- NAT/PAT
- PAP, CHAP
- IPSEC, GRE
- ACLs, Stateful Firewall
- Port forwarding
- Enable / disable services
- Multilevel security access
- Password encryption
- Radius support
- VPN
- CSD-GSM CLI

SERVICES

- DHCP client, DHCP server
- HTTPS
- Ping, Traceroute
- NTP Client and Server support
- DNS
- Possibility to disable network services when not in use
- Timestamp service
- SSh client and Server
- Telnet client and Server
- FTP Client
- SMS

MANAGEMENT AND CONFIGURATION

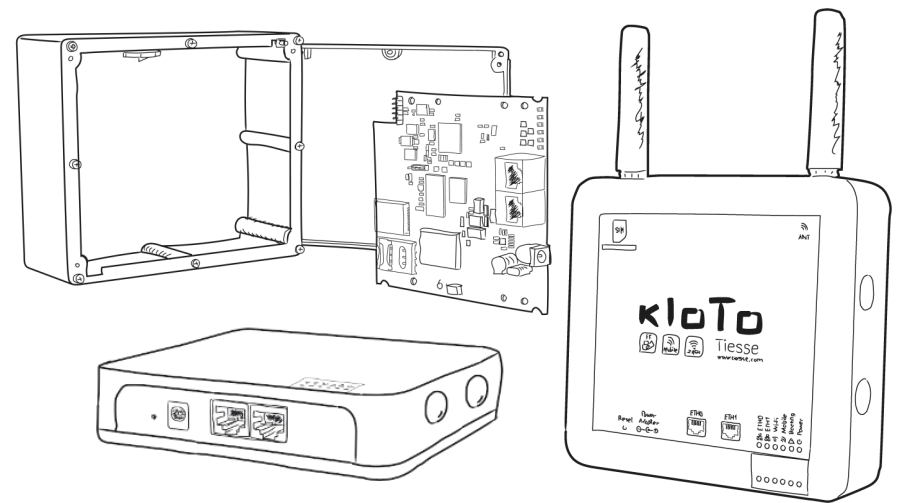
- SNMPv2, SNMPv3
- Telnet client and server
- SSHv2
- sFTP client
- Syslog server
- Event logging
- Different levels of logging
- Radius Support
- TACACS local authentication
- Configuration via command Line Interface (CLI)
- Possibility to implement custom commands

Add-ons for Levanto series

Levanto models are provided with optional add-ons like directional / omnidirectional antennas for outdoor installations as well as brackets for wall or DIN mounting and power AC/DC power supply



kloTo series

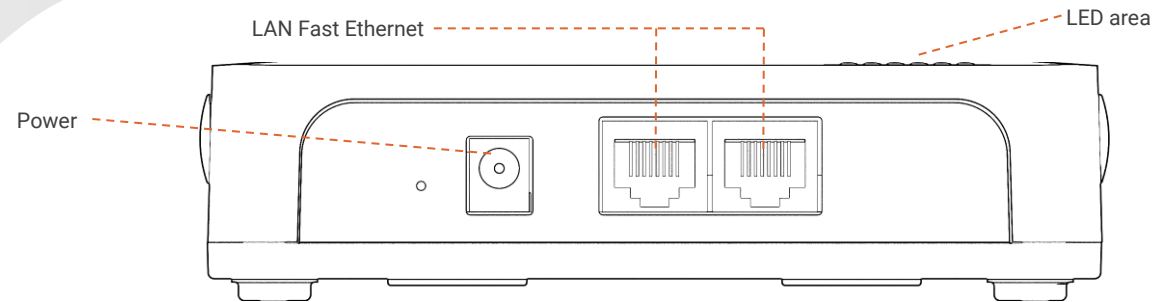


kloTo series

Cellular routers boxed and naked versions



Cellular routers for M2M/IoT applications



kloTo 532 boxed version

kloTo series

kloTo 532 series comes in two different version: the boxed one, which has a plastic case, that can be also be mounted on a DIN rail, and the naked version, which is composed by the card only.

The **naked version** is so versatile that many clients has chosen it because it can be mounted and connected inside other system.

For example, a model of kloTo has been inserted in a IP64 integrated system, used for telecontrol and remote monitoring in the energy field.

The naked version of kloTo can be easily integrated in other machinery, like professional coffee machines used in coffee shop, bar and restaurants.

kloTo 530 is a **highly customizable** router, which can be easily installed inside various types of machinery, so the data exposed must be taken as an example.

HARDWARE FEATURES		530	532	532-N
LAN	– FE – 10/100 Mbps ports, base T - RJ45 connectors	1	2	2
	– Wi-Fi – 802.11 b/g/n (2.4 GHz), mode Station or SoftAP	1	1	1
	– Different versions are available for region (WW, LATAM, ...) and category	•	•	•
	– Bands – LTE FDD: B1/B3/B7/B8/B20/B28 – WCDMA: B1/B8	•	•	•
RADIO CELLULAR	– GSM – EDGE: max 296 Kbps (DL) - max 236.8 Kbps (UL) GPRS: max 107 Kbps (DL) - max 85.6 Kbps (UL)	•	•	•
	– UMTS – DC-HSDPA: max 42 Mbps (DL) – HSUPA: max 5.76 Mbps (UL) – WCDMA: max 384 Kbps (DL) - max 384 Kbps (UL)	•	•	•
	– LTE – Support up to CAT4	•	•	•
	Serial port	•	-	-

kloTo series

Cellular routers boxed and naked versions

- kloTo 532
- kloTo 532-N

SOFTWARE FEATURES

Note: the list below is purely indicative; the features depend on the NoS version and update.

NETWORKING

- IPv4, IPv6

SERVICES

- DHCP
- Intelligent DNS Proxy, Dynamic DNS
- Tracking for backup management, commands and scheduled events

SECURITY

- SSID broadcast disable feature
- WPA-PSK e WPA2-PSK, WEP data encryption
- NAT/PAT

MANAGEMENT AND CONFIGURATION

- SNMP
- SSH
- Telnet
- Configuration via command Line Interface (CLI)

Add-ons for kloTo series

kloTo models are provided with optional add-ons like directional / omnidirectional antennas for outdoor installations as well as brackets for wall or DIN mounting.

Please, see the add-ons documentation for specific information. You can download it at www.tiesse.com.



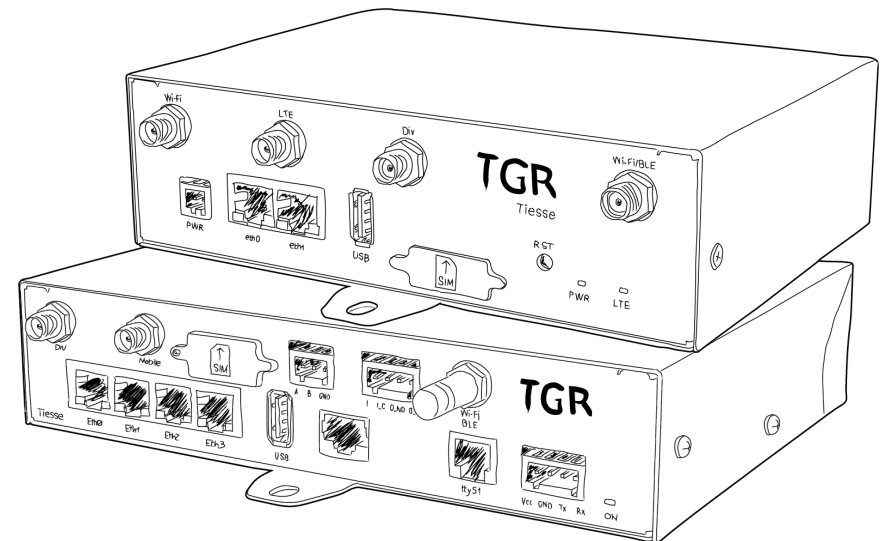
SYSTEM FEATURES

POWER	Power supply	– 100-240 VAC (12 V adapter) – Power 9-30 Vdc
	Consumption	< 3 W
ENVIRONMENT	Operating temperature	-10° C / +55° C
PROCESSOR		ARM up to 400 MHz (kloTo 532) ARM9 (kloTo 530)
MEMORY	DRAM	128 MB (kloTo 532) - 1GB (kloTo 530)
	Flash memory	256 MB (kloTo 532) - 2 GB NAND (kloTo 530)

kloTo 532 - EXTERNAL HARDWARE FEATURES

HOUSING	Material	– Plastic - color: white (chassis version only)
		– kloTo 532 (chassis) – Without antennas: 123 x 34 x 134 mm
SIZE	Dimensions (W x H x D)	– kloTo 532-N (naked) card only: 120 x 17 x 105 mm
		– kloTo 530 (naked) card only: 75x134x22,6 mm
ANTENNAS	WLAN	– On board antennas
	Radio cellular	– 2 x external removable antennas SMA male connectors
MOUNTING	Default	– Desktop (kloTo 532)
	Optional	– DIN rail mouting with optional kit (kloTo 532)
LED (kloTo 532)	Status LED	– 1 x power / operational status
	Boot	– 1 x booting status for each port
	Ethernet	– 1 x operative status for each port
	Wi-Fi	– 1 x radio signal 2.4 GHz activity
	Cellular	– 1 x radio-cellular connection status and network

TGR series



TGR series

Industrial LTE router and EDGE gateway



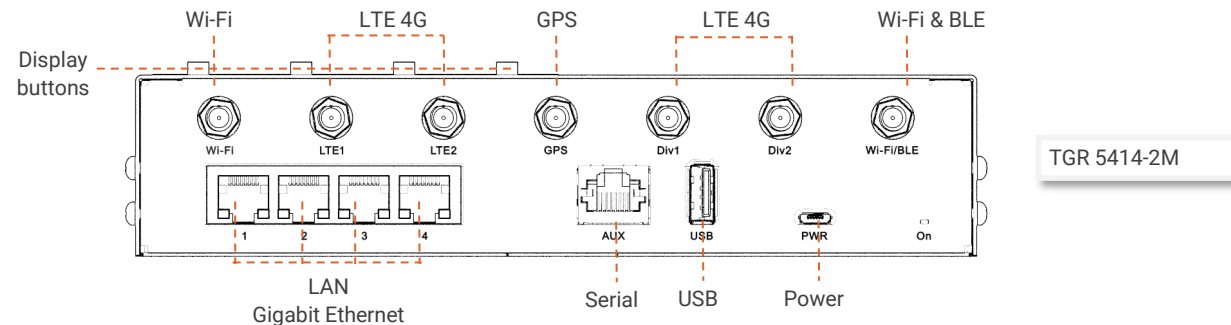
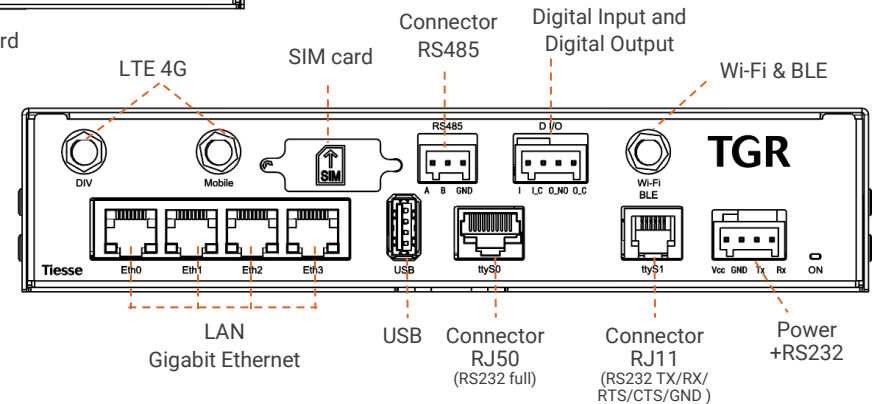
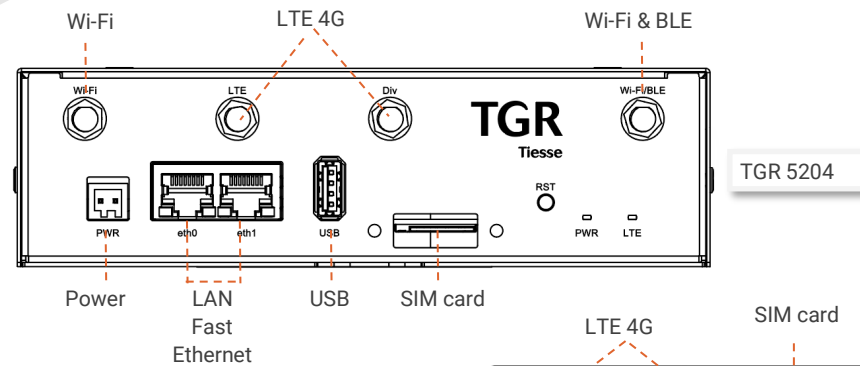
Cellular routers for M2M/IoT applications

TGR series

The **TGR** product series is designed to be used in industrial and security scenarios with **open source** or third party software hosted directly on the hardware platform.

TGR offers a wide range of connectivity and routing capabilities in a compact design.

Thanks to the LTE port, they are suitable for "always-on" communications in mission-critical scenarios.



TGR series

Industrial LTE router and EDGE gateway

HARDWARE INTERFACES FOR THE IMOLA E CARD SLOTS			5204	5432	5414-M
LAN	– FE	– 10/100 Mbps ports, RJ-45 connector	2	-	-
	– GE	– 10/100/1000 Mbps ports, RJ-45 connector	-	4	4
SERIAL		– 1x RS-232 (RJ11 female) - RX-TX-RTS-CTS – 1x RS-232 (RJ50 console port) - FULL – 1x RS-485 (3-pole external screw terminal) half duplex – 1x RS232 TX-RX	-	•	-
USB		– USB 2.0 Host (type A connector)	1	1	-
		– USB 3.0	-	-	1
Digital/O		– 4-pole, external screw terminal	-	1	
Bluetooth & Wi-Fi	– BLE	– BLE 5.0	•	•	•
		– Personal & Enterprise IEEE 802.11 WEP, WPA, WPA2 Security	•	•	•
	– Wi-Fi	– Wi-Fi IEEE 802.11 a/b/g/n/ac (2x2) – Throughput up to 867 Mbps – Max number of client supported: 32	•	-	•
		– Wi-Fi IEEE 802.11 b/g/n 20 MHz (1x1) – Throughput up to 50 Mbps – Max number of client supported: 8	-	•	-
RADIO CELLULAR	– SIMS	– Simultaneous active SIM	1	1	2
	– GSM / GPRS / EDGE	– Bands: 900 / 1800 / 1900 MHz GPRS multislots 10, EDGE multislots 12	•	•	•
	– UMTS / HSDPA	– Bands: 900 / 2100 Mhz	•	•	•
	– HSUPA / HSPA+	– HSDPA data rates up to category 20 – HSUPA data rates up to category 6	•	•	•
	– DC-HSPA+	– DC-HSPA+ (42 Mbps in DL)	•	•	•
	– WCDMA	– Frequency band: 900 / 2100 Mhz	•	•	•
	– 4G	– Bands: 800 / 900 / 1800 / 2100 / 2600 Mhz – Data rates (category 4, MIMO)* – Peak data rates 150 Mbps DL, 50 Mbps UL (actual throughput depends on network configuration, number of connected users and RF signal conditions) – WCDMA 900/2100	•	•	•

* category 6 and 12 available on request



TGR 5414-2M, a highly customizable model

TGR 5414-2M is the last TGR model introduced in the series.

It is built to encounter the customer needs with high customization standards.

For example, it has **two LTE modem simultaneously active**; thanks to a management Api both SIM and IMEI can be swapped and changed.

Other hardware features also include **GPS** and **accelerometer**, with their relative APIs.

TGR 5414-2M comes with **Asterisk** pre-installed.

TGR series

Industrial LTE router and EDGE gateway

SYSTEM FEATURES

POWER	Power supply	<ul style="list-style-type: none"> – TGR 5204: 12-48 Vdc – TGR 5432: 9-29 Vdc – TGR 5414-2M: connector USB C 5V 	
	PSU option	<ul style="list-style-type: none"> – 230 Vac 	
	Consumption	<ul style="list-style-type: none"> – Average power consumption: 4 W 	
ENVIRONMENT	Operating temperature	<ul style="list-style-type: none"> – -20° C / +70° C 	
	Storage temperature	<ul style="list-style-type: none"> – -40° C / +70° C 	
	Max operating humidity	<ul style="list-style-type: none"> – 95% (non condensing) 	
PROCESSOR		<ul style="list-style-type: none"> – TGR 5204 – 4x Cortex-A53 up to 1.6GHz per core – + 1x Cortex-M7 core up to 400MHz 	
		<ul style="list-style-type: none"> – TGR 5432 – 2x Cortex A7 core up to 1.2 GHz – +1 x Cortex-M4 	
		<ul style="list-style-type: none"> – TGR 5414-2M – 4x Cortex-A53 up to 1.8GHz per core – + 1x Cortex-M7 	
MEMORY	Main	<ul style="list-style-type: none"> – TGR 5204: LPDDR4 2 GB – TGR 5432: DDR3 1 GB – TGR 5414-2M: LPDDR4 2 GB 	
STORAGE		<ul style="list-style-type: none"> – TGR 5204: eMMC Storage 8 GB + internal microSD – TGR 5432: eMMC Storage 8 GB – TGR 5414-2M: eMMC Storage 8 GB + internal microSD 	

SOFTWARE

OS	<ul style="list-style-type: none"> – TGR 5432 and 5204: Debian by default – TGR 5414-2M: Asterisk
	<ul style="list-style-type: none"> – Optional: other Linux versions
Software platform	<ul style="list-style-type: none"> – Docker
Extended features	<ul style="list-style-type: none"> – Configurable via script based on Python or PERL

EXTERNAL HARDWARE FEATURES

HOUSING	Material	<ul style="list-style-type: none"> – Metal, blue sapphire
	Dimensions (W x H x D)	<ul style="list-style-type: none"> – TGR 5204: 165 x 47 x 164 mm (hooks included) – TGR 5432: 195 x 42,1 x 184 mm (hooks included) – TGR 5414-2M: 195 x 42,1 x 184 mm (hooks included)
ANTENNAS	Radio Wi-Fi / BLE	<ul style="list-style-type: none"> – External removable antennas – TGR 5204: 2 x SMA male connector – TGR 5432: 1 x SMA male connector – TGR 5414-2M: 1 x SMA male connector
	Radio mobile	<ul style="list-style-type: none"> – 2 x 4G external removable antennas, SMA male connector
MOUNTING	Default	<ul style="list-style-type: none"> – Desktop / horizontal plane / wall mounting
	Optional	<ul style="list-style-type: none"> – DIN rail mounting with optional kit
LED	Status LED	<ul style="list-style-type: none"> – 1 x power / operational status
	Ethernet	<ul style="list-style-type: none"> – 2 x operational status (for each port)
	Radio mobile	<ul style="list-style-type: none"> – TGR 5204: 1 x radio mobile connection link status



About us

Tiesse is a 100% Italian company that, since 1998, has been designing and manufacturing ultrabroadband and cellular routers, industrial routers, switches, gateways, IoT/M2M devices and automation, management and monitoring systems.

With more than 25 years of experience, Tiesse has become one of the leading suppliers of CPE (Customer Premise Equipment) with both fixed and cellular radio and Wi-Fi connectivity for the main Telecommunications operators.

Tiesse S.p.A. has a long experience in providing - from designing to production - **innovative products and technologies for enterprise networks and mission critical infrastructures**. Our customers are large national and international companies in sectors such as telecommunications, energy, finance, industry, public administration and defence.

Tiesse's solutions consist of **Imola** and **Lipari**, Tiesse's ultrabroadband router series with both fixed and cellular connectivity, and the Elba switch series: you can find them in the major telecommunications networks, petrol stations, insurance companies, banks and the networks of major gaming operators.

The **Levanto** and **kIoTo** series IoT devices are present in the networks of major international operators in the energy and utilities sectors. Last but not least, the **TGR** series consists of products that are industrial LTE routers and Edge gateways, which also meet security and satellite communication requirements.

Innovative, competitive and certified, the entire line of Tiesse products and solutions is further enhanced by virtual routers and the **TNA** (Tiesse Network Architecture) software suite, which allows remote management and real-time monitoring of the network and its individual devices.

Innovation made in Italy

Our motto denotes our desire for innovation and continuous research, to provide intelligent and secure connectivity to national and international companies. Made in Italy is synonymous with **reliability, quality** and **security**.

In addition, since 2016, Tiesse has been granted the status of **Innovative SME by the Ministry of Economic Development (MISE)**, as it is characterised by a strong innovation component with significant R&D expenditure. Tiesse's products are at the cutting edge of technology also thanks to continuous investment in R&D and close collaboration with Telco's and Universities.

Passion for Technology

is written in the **DNA** of Tiesse and of the people who are part of it: this factor, added to the enhancement of talent, resource management and flexibility, makes our company an excellent organisation.

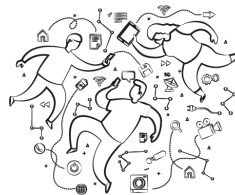
Commitment to the customer

is present at every stage of the product lifecycle, from design to installation and after-sales support. The total resolution of any problems that may arise is accompanied by the complete satisfaction of our customers. Our **competence, reliability** and **experience** have also enabled us to develop innovative projects for our customers, who have entrusted Tiesse with the research and development of some of their products



INNOVATION

Our motto is "Innovation Made in Italy" and we stuck to it!



PASSION

The passion for technology is written in our DNA



COMMITMENT

Commitment to the customer is present at every stage of the product lifecycle

About us

Quality and sustainability

Tiesse implements a quality management system in accordance with the principles of the latest **ISO 9001** standard and guarantees the **quality, safety and efficiency** of its research, products and services.

Tiesse is also certified both **UNI EN ISO 14001:2015** (Environmental Management System) and **UNI EN ISO 14064-1:2019** (Greenhouse Gases), furthermore it activates projects to compensate CO2 emissions generated by the production of its products, such as the planting of trees. Tiesse works continuously to improve the **durability of its products** and to reduce the use of plastic in the packaging process in view of the plastic-free objective, selecting recycled and recyclable materials from verifiable and controlled supply chains.

Last but not least, it focuses on remanufacturing, refurbishing, upgrading or replacing its products for new use in the field.



ISO 9001:2015

QUALITY

We got certified to ensure high quality standards



ISO 14001:2015

ENVIRONMENT

We care about nature and the environment, we design and produce in their respect



ISO 14064-1

GREENHOUSE

Because we care about nature, we worked hard to limit the gas emissions that hurt the planet



1000 Trees in Italy

Sustainability

And even before we got the environmental certifications, we had already started planting trees to support the planet

Milestones

Tiesse has achieved several milestones over the years, the most important of which include:

- **Leadership** with connectivity solutions in the areas of **e-money, regulated gaming** and betting
- **Leadership** in the **telecommunications** network sector with products certified by the main Telco operators in the Italian market, with volume (white label) and project-based supplies
- **Leadership** with the supply of **LTE routers** for the main telecommunications operators also for mission critical scenarios
- **Leadership** in the **energy field**, with important volume supplies of routers for remote control and monitoring in primary and secondary substations in Italy, Europe and Latin America (also in Smart Grid scenarios)
- **Strong position** for supplies in the **distributed networks** of banks, service stations, insurance companies, municipalities and public bodies, dealers, large-scale distribution, retailers and franchising

Research and innovation

Tiesse pursues research and technological innovation through:

- Digitisation with 5G radio connections
- Virtual routers
- Overlay network
- Network Anomaly Detection
- Edge routing solutions and IoT applications with docker containers
- Embedded systems

Where we are

Tiesse is located in the North of Italy in **Ivrea** (To), where you will find the headquarters with management, administration, research & development, 2 production sites and warehouses. Further sales offices and R&D centres are located in **Rome**, **Avezzano** (AQ) and **Turin**.

On the Internet, Tiesse can be reached from its website www.tiesse.com and its page on [LinkedIn](#).



Our solutions and products: security, business continuity and high performances

ACCESS ROUTERS

Ultra broadband routers

- o Imola
- o Imola LX



Cellular routers

- o Lipari



Industrial routers

- o Imola SGR
- o Imola E



Switch

- o Elba



- Selected and certified by leading TELCOs and ISPs
- Compact and all-in-one models
- xDSL, fibre, 4G and 5G cellular radio, Wi-Fi radio
- Industrial and rack mountable devices
- Models for industrial and Smart Grid environments

DEVICES FOR IoT CONNECTIONS

IoT & M2M devices

- o Levanto
- o kloTo



- Radio-cellular connectivity up to 4G
- Remote device management and control
- Suitable for being housed within industrial systems, cabinets or machinery, power cabins,...

Industrial LTE gateway and EDGE routers

- o TGR



- High reliability, flexibility and versatility
- Multiple serial, I/O and Ethernet ports to support different application scenarios
- Open platform to host even third-party applications

SOFTWARE FOR MANAGEMENT AND AUTOMATION

Automation software

- o TNA (Moduli CoS, MoS, OVN)



- Software suite enabling Zero Touch Provisioning management of networks
- Includes monitoring, automatic configuration management, traffic engineering: 360 degree network control
- Network Anomaly Detection

Virtual routers

- o MTNOS



- Virtual Router implementing layer 2 and layer 3 functions
- Suitable to be hosted on third-party hardware platforms with Linux operating system.
- Installable on virtual machines in Cloud scenarios.

INTEGRATION AND CUSTOMISATION

Custom & Vertical

- Customised software pre-configurations and bundles
- White labels for volume sales
- Design, engineering, production and certification to customer specifications
- Research and development projects for solutions with different technologies (e.g. NB-IoT, LoraWAN, ...)



Tiesse

Innovation made in Italy®

Tiesse is a **totally Italian company** which has more than 20 years of expertise in designing, developing, and manufacturing both M2M/IoT and network devices. The **IMOLA**, **LIPARI** and **LEVANTO** product series are innovative, competitive and certified, and they are present in the largest distributed Italian networks (telco and from gas stations to large retailers, insurance companies and banks) as well as in the largest networks of the main gaming operators and energy sector.



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