

Imola E

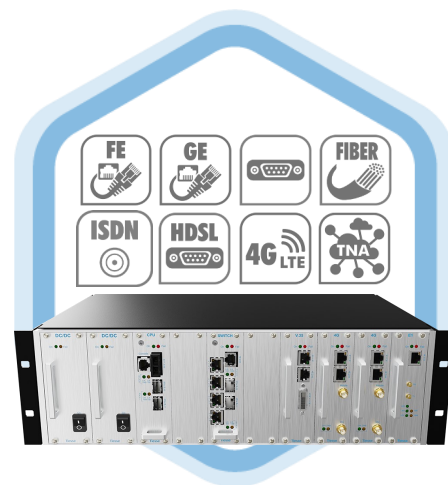
**Modular router and rack mountable
for industrial environments**



Datasheet

Imola E

Modular router, rack mountable for industrial environments



Imola E is a modular router, configurable and highly reliable, which integrates data and voice routing functions on LAN and WAN channels, both “wired” and “wireless”. It is certified to work in industrial environments where electromagnetic disturbances are present.

FEATURES

The **Imola E** modular routers fit into the evolution of the Imola router series, which are certified and used by the main telecommunication operators in their networks.

All Imola routers include the following functionalities:

- **Routing**
- **Switching**
- **Multi fail-over**
- **QoS**
- **Security**

Also for fiber networks

KEY BENEFITS

- ⇒ Modular, robust and reliable
- ⇒ Integration between different communication channels
- ⇒ Security
- ⇒ Always-on connectivity and service continuity
- ⇒ Easy installation and factory pre-configuration
- ⇒ SIMs are installed and tested in factory on each device
- ⇒ Remote management and provisioning
- ⇒ Scalability
- ⇒ Multiple backup
- ⇒ Zero touch provisioning

APPLICATIONS

Imola E is particularly suited for business applications where security, continuity of service and network performances are of primary importance. It is also certified to work in industrial environments where electromagnetic disturbances are present and in particular in the application sectors:

- Energy
- Substation Automation
- Transportation
- Smart Grid
- Utilities

MODULAR

Modular architecture allows the evolutionary growth of the product over time, with the integration of new features and communication channels on the system in the field. The automatic backup and the presence of redundant hot-swappable power supplies guarantees continuous up-time.

- 2 slot for power
- 1 CPU slot
- 7 slot for the other cards (LAN switch, fixed and cellular connectivity)

Integrazione between different channels

Imola E offers in a single modular system the maximum integration between different communication channels: Ethernet on wire and fiber optics, ISDN, serial WAN V.35, V.24/V.28, E1 G.703, 3G/4G and HDSL.

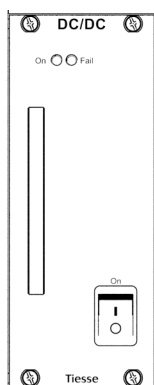
LAN ports can be used for satellite connections.

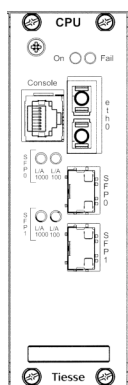


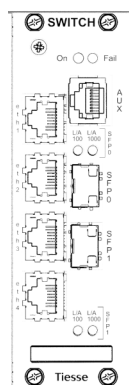
INTERFACES

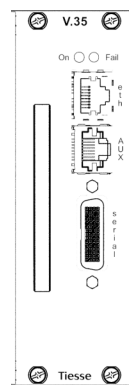
HARDWARE INTERFACES FOR THE IMOLA E CARD SLOTS			CPU	Switch	WAN V.35	WAN E1	WAN 4G
LAN	GE	100/1000 Mbps dual purpose port - SFP/RJ45 connectors	2	2	-	-	-
		10/100/1000 base TX port - RJ45 connector	-	-	1	-	-
	FE	100 Base FX ports - MTRJ connectors	1	-	-	-	-
		10/100 Mbps base TX ports - RJ45 connectors	-	4	1	1	1
WAN		V.35, 2 M port - ISO DIN 2593 connectors	-	-	1	-	-
ISDN		ISDN E1 port WAN serial G.703 interface - microcoax cable	-	-	-	1	-
RADIO CELLULAR	GSM GPRS EDGE	- Frequency band: GSM 850 Mhz, EGSM 900 Mhz) DCS 1800, PCS 1900 MHZ - GPRS multislot 10 - EDGE multislot 12 - throughput up to 236 kbps	-	-	-	-	•
	UMTS HSDPA HSUPA HSPA+	- Frequency band: Band 1 (2100 MHz), Band 2 (1900 MHz), Band 5 (850 MHz), Band 6 (800 MHz), Band 8 (900 MHz) - HSDPA data rates up to category 20 - HSUPA data rates up to category 6	-	-	-	-	•
	DC-HSPA+	- 42 Mbps in download	-	-	-	-	•
	WCDMA	- Frequency band: 900 / 2100 Mhz	-	-	-	-	•
	4G	- Frequency band: band 1 (2100 MHz), band 3 (1800 MHz), band 7 (2600 MHz), band 8 (900 MHz), band 20 (800 MHz) - Category 4, MIMO* - Peak rate 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)	-	-	-	-	•
CONSOLE		Asynchronous serial port, up to 115.2 Kbps - RJ45 connector	1	1	1	1	1

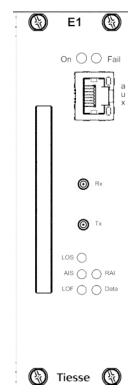
Card slots

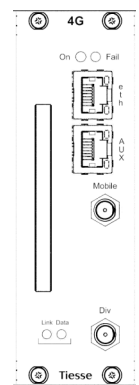

Power

 Code
M-PWR-DC_S1

CPU

 Code
IM-CPU_S2

Switch

 Code
IM-SW-2SFP-4TX_S2

WAN V.35

 Code
IM-W-V35_S2

WAN E1

 Code
IM-W-E1_s1

WAN 4G

 Code
IM-W-4G_S1


Imola E - modular router, rack mountable, for industrial environments

Modular architecture for the evolutionary growth of the product over time

FIBER ACCESS

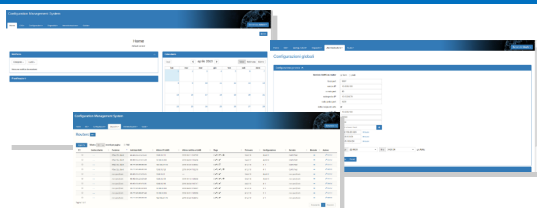
- Single and/or multiple fiber access for LAN and WAN via fiber and optic cables
- GPON connections are supported
- Different types of transceivers supported:
 - max data rate 1000 Mbps (SX, BX, LX, ZX)
 - supported connectors: LC simplex, LC duplex, RJ45

4G FEATURES for 4G CARD SLOT**Radio interfaces**

- LTE with 150 Mbps downlink data rate and 50 Mbps uplink data rate
- HSPA+, with 21.1 Mbps in Downlink data rate and 5.7 in Uplink data rate with fallback EDGE / GPRS
- Support of Dual Cell HSPA mode
- Multiple Input/Multiple Output (MIMO) support included
- It is possible to activate and configure two or more APNs simultaneously

4G ANTENNAS

- Multiple Input / Multiple Output (MIMO) support
- 2 magnetic removable antennas (SMA male connector)
- Frequencies: 820-960 / 1720-2700 Mhz (cod. ANT021)
- Optional: outdoor high gain antennas are also available (omnidirectional and directional) for outdoor installation

Zero Touch Provisioning

Imola E is 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

ROBUST AND FLEXIBLE

- Extended operating temperature range, from -10° C up to +55° C
- Suitable for industrial environments with presence of electromagnetic disturbances
- **High flexibility** in defining both main and secondary back up lines
- **Independent hot swappable boards**
 - **Routing**
Support of all main dynamic routing and Multicast protocol (BGP4, OSPF, RIP, IS-IS)
 - **Security**
Support of the main security protocols (IPSEC, EASY VPN, MS-PPTP, stateful firewall (integrated))
 - **Management**
All functionalities are manageable via SNMP

BACKUP: high availability - mission critical**Seamless backup**

The user doesn't notice any service interruption and the following passage to backup mode.

This passage from Standard mode to backup mode (and viceversa) is accomplished with taking care of operative costs.

Multiple backup

Two routers connected with VRRP creates the physical backup of both network and hardware.

Homogeneous Backup

One single router is equipped with both wired and mobile ports.

Heterogeneous Backup

You can upgrade the devices installed base with a mobile router and use the VRRP protocol (Virtual Router Redundancy Protocol).



SOFTWARE features

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

NETWORKING

- TCP-UDP IPv4
- IPv6
- IP protocol suite: ICMP, ARP, NTP
- DDR – “Dial on Demand Routing” ISDN (Call Back, CLI identification – Caller and Calling, Channel aggregation)
- PPP Point-to-point Protocol or SLIP for data encapsulating on serial line or dial-up

LAYER 2 features

- VLAN: support without limitation of the tags usable on each L2 or L3 interface - interVLAN routing
- L2TPv3 (RFC 3931) static and dynamic
- L2 tunnel for “GOOSE” messages (IEC 61850)

ROUTING & MULTICAST

- Static, Policy-based routing, RIPv1, RIPv2, RIPv3

MULTI LAYER SWITCH

- Tunnel IPv6 in IPv4
- BGP-4, BGP-4+
- OSPF multi area NSSA areas support
- IPv6 routing protocols: RIPv3, OSPFv2, OSPFv3

FRAME RELAY

- Multi VRF
- VRRP (Virtual Routing Redundancy Protocol) with IPv4-IPv6 authentication
- IGMP v1-v2-v3, IGMP snooping, IP Multicast routing with PIM sparse-mode PIM Source Specific Multicast (SMM), IP Multicast over
- IEEE 802.1q/802.1p
- Rapid Spanning Tree
- Internetworking: backup trigger and routing based on interfaces, table routing content and ICMP Probing
- “Bridge Loop Prevention” protocols, for both physical and ring topologies
- Configurability of allowed tags on L2 interfaces (trunk)
- Local switching (for Ethernet L2 ports)
- Multi-protocol over Frame Relay RFC 2427, up to 8 active PVC, ITU-T X.36, ANSI T1 617 Annex D
- ITU-T Q.993 Annex A

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
- Traffic Marking: CoS (Ethernet) or IP Precedence/DSCP on previously classified traffic
- Congestion management
- Guarantee bandwidth management
- QoS functionalities applicable to the traffic in the L2TPv3 and IPSec tunnels

SECURITY

- IEEE 802.1x
- NAT/NAPT network and port address translation - IPSec NAT-Traversal
- ACLs
- Stateful and Zone Based Firewall
- SSL and GRE Tunneling
- Password Encryption
- GRE Tunneling, GRE over IPSec
- Tunnel IPv6 in IPv4

SERVICES

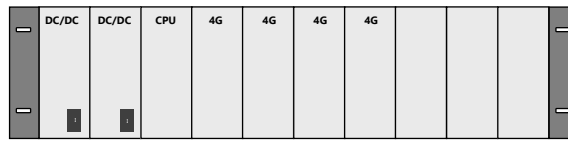
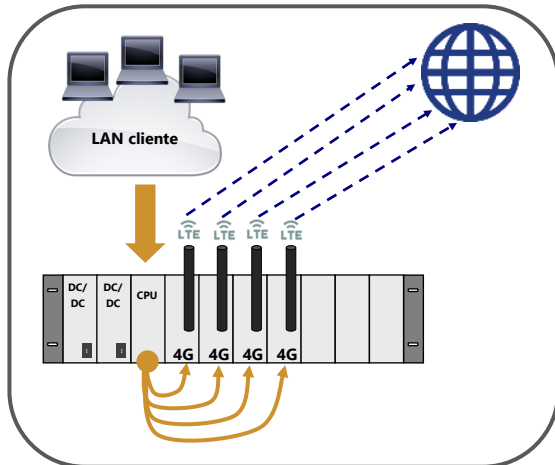
- DHCP client, DHCP server
- Traceroute
- DNS Client
- Syslog (Local and remote) with timestamping
- Source IP configurable for management purposes
- Running actions triggered by event detections
- Probing of remote destinations

MANAGEMENT and CONFIGURATION

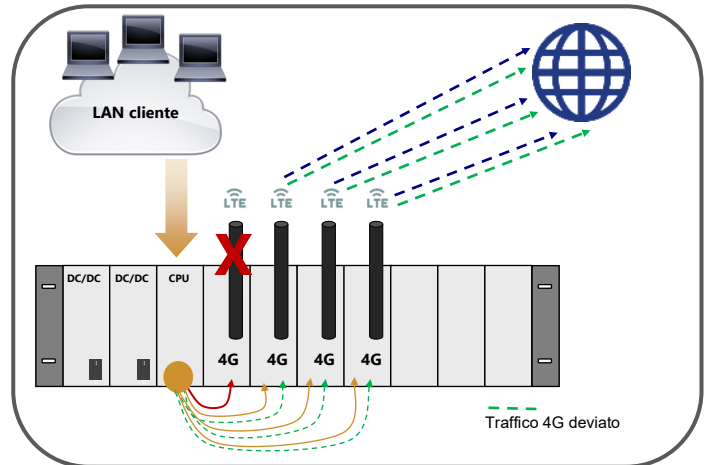
- SNMP v1, SNMPv2, SNMPv3 for alarm sending and MiB access
- Telnet server
- SSH server
- Radius Support, TACACS+
- Configuration via Command Line Interface (CLI), status and resource statistics displaying (i.e. CPU, interfaces, routing protocols, IPSec)
- Real-time debug and log buffer debug with timestamping
- Session logging
- TNA (Tiesse Network Architecture) suite for auto-provisioning and remote automated management

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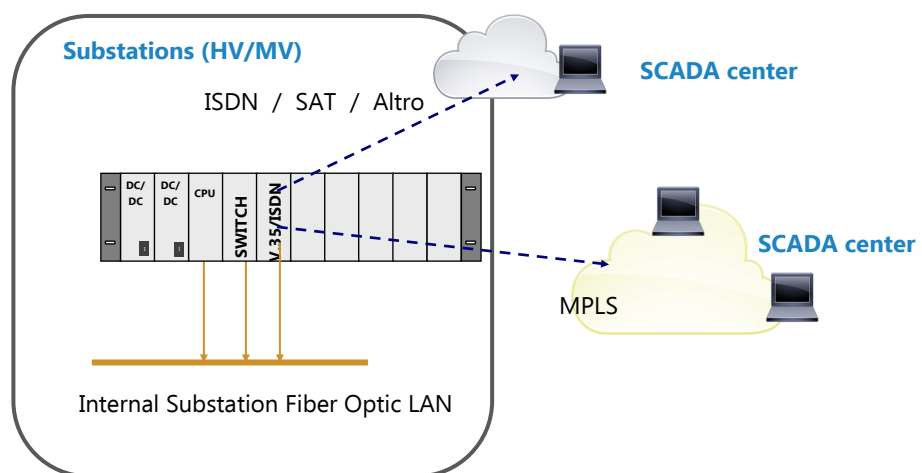
Modular architecture for the evolutionary growth of the product over time

SCENARIOS**4G usage scenario****Imola E with four 4G cards****LOAD BALANCING**

Guarantees the distribution of traffic on the 4G available cards.

**ACTIVE BACKUP**

In the event that one or more cards fail to operate, traffic is automatically switched vs the other 4G cards.

Substations Remote Control System Scenarios

Imola E provides network link backups, all common security levels and flexibility to implement future connections and smart grid networks.

SYSTEM FEATURES

POWER

DC/DC card

Power supply DC 24 Vcc positive to ground

Power supplies operate in a load sharing configuration with active reserve. Three alternative configurations are possible:

- 2 power supplies 24 V \pm 20% DC (positive ground)
- 2 power supplies 48 V \pm 20% DC (positive ground)
- 2 power supplies 220 V \pm 20% AC (on request)

ENVIRONMENT

Operating temperature:

-10° C / +55°

PROCESSOR

RISC Network processor

MEMORY

DRAM 64 MB memory default
Maximum 128 MB @ 66/133 Mhz

FLASH MEMORY

Default 16 MB – Maximum 64 MB

BOOT FLASH

512 K

SIZE

19" / 443,5 mm

3 U

12,59"

321,2 mm (included contact protection shell on the back)

EXTERNAL HARDWARE FEATURES

Material

Case: metal - black color

Cards: metal - silver

Antennas

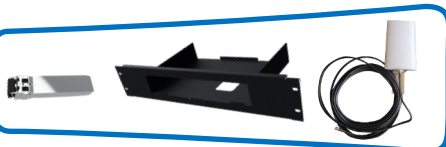
4G Radio cellular card

2 external removable antennas for each card
SMA male connectors

Mounting

Desktop / horizontal plane
3U rack mounting

ADD-ONS



Imola E models are provided with optional add-ons like omnidirectional outdoor antennas and brackets for mounting on a 1U rack.

These fiber models support also a wide range of SFP transceivers.

Please, refer to the specific documentation on both add-ons and supported SFP transceiver for more information.

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

innovation made in Italy®

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) as well as in the largest networks of the main gaming operators and energy sector.

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