# REGESTA-PRO ER Routers

## *Industrial-grade broadband routers for remote infrastructure communications*

The REGESTA-PRO ER are highly intelligent industrial-grade routers that deliver secure and reliable broadband IP connectivity to SCADA telemetry and telecommand networks. They are designed for critical infrastructure and remote facilities with industrial processes including the Smart Grid, pipelines and traffic control systems.

Thanks to the integrated Ethernet switch, the REGESTA-PRO ER is capable of serving a large number of intelligent electronic devices at the remote site without additional equipment. Its embedded managed switch includes full support of VLANs and other advanced switching features.

The router can guarantee optimum performance and maximum security in communications among multiple services in IP networks. The router multiplexes remote site communications using embedded cellular broadband or DSL links; or flexible external modems. Maximum reliability communication is guaranteed thanks to a full range of management, supervision and backup functions.

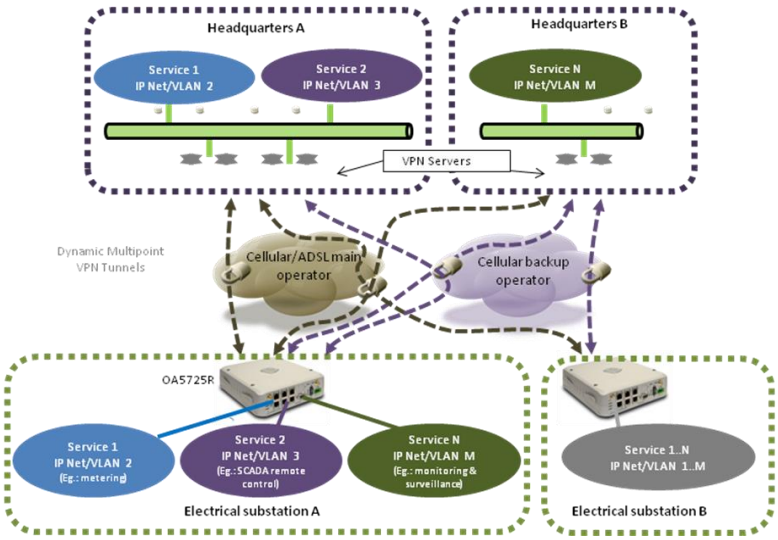
The Teldat Internetworking Software (CIT[1]) endows REGESTA-PRO ER routers with the intelligence required for the efficient implementation of highly secured, scalable and permanently available communications services based on broadband links. Communications security is supported with state of the art low latency hardware encryption, and the most complete stack of VPN protocols and firewalling techniques. The vast support of business-grade management features in CIT guarantees centralized operation, administration and management of the REGESTA-PRO ER installed base.

### PRODUCT OVERVIEW

- Up to two embedded wireless broadband interfaces, depending on the model, with dual SIM to automatically backup communications. Teldat's advanced system for proactive monitoring and Wireless-WAN failure recovery.
- Optional ADSL2+/VDSL2 port.
- Up to three asynchronous serial ports, depending on model.
- Up to 6-port Ethernet switch with autonomous management (per port), full VLAN support and MAC filtering.
- Adapted hardware designed for 24x365 use in industrial environments: comprehensive electrical insulation of communication ports, power source and critical components, HW supervision (watchdog).
- Prepared for DIN rail mounting.
- Powered at 24 or 48 VDC or at 110-220 VAC (depending on model).
- Status/speed LEDs per Ethernet port, network coverage/status LEDs and device management LED (configurable).
- Teldat command console for advanced configuration and detailed debugging reports of the communications service. Local (console port) or remote (telnet, ssh) access to management console.
- Comprehensive networking protocol stack, with advanced routing features, state of the art cyber-security and special resilience techniques.
- Centralized management for the wireless service through TeldaGES web-based console or leading third party network management platforms.
- Compatible with Teldat's central site concentrators for a complete turn-key solution. Given its standards-compatibility, it can also perfectly interoperate with third-party concentrators.

[1] CIT: Teldat router Internetworking Software for professional environments.

## APPLICATION SCENARIO: Smart Grid management and monitoring




Each power utility transformer substation has multiple intelligent devices and industrial control equipment managed through SCADA protocols, grouped in the IP subnet and the appropriate VLAN segment, and connected via a serial or Ethernet port of the REGESTA-PRO ER.

The router combines the SCADA traffic flow for each service in a VPN tunnel thus guaranteeing maximum security in wireless communications. The VPN servers take each flow from the VPN tunnel and transmit it to the corresponding monitoring station through the central IP subnet and the appropriate VLAN segment.

The REGESTA-PRO ER proactively monitors the wireless connection and the VPN tunnel. When the router detects unusual degradation in communications or if the tunnel is down, it automatically switches transmission to the backup network and the VPN tunnel thus maintaining constant communication continuity with the remote site.

## TELDAT ADVANCED COMMUNICATION FEATURES

- **Outstanding cellular broadband communication performance and reliability**
  - Embedded wireless module constantly monitored by the router's management engine.
  - Passive supervision (non poll based): Automatic unavailability detection for wireless communications technology in the service area, connection failure and/or inactivity in traffic reception.
  - Active supervision (poll based): Proactive degradation detection in wireless communications. The router analyses IP packet error rate, latency and link jitter in a predefined timeframe.
  - Auto-recovery mechanisms against faults detected in supervision: Restart the connection or switch to an alternative network.
  - Real time network diagnostics available on console, in the corporate network management station (SNMP and Syslog alarms).

- **Latest generation meshed VPN networks**
  - IPsec state of the art technology. Guaranteed compatibility with third party VPN servers.
  - Dynamic Multipoint VPN technology to deploy efficient and scalable meshed VPN networks.
  - Access list system to control the access.

- **Optimum remote site LAN communications performance:**
  - Full VLAN support (labeling, filtering, VLAN trunking, etc.) guaranteeing optimum performance from each M2M service subnet on site, together with seamless integration in the enterprise's communications network.
  - Per port MAC filtering and IP for LAN segment security.
  - DHCP server with subnetting to auto-configure IP subnets on site.
  - Detailed diagnostics and SNMP management per Ethernet port.

- **Teldat QoS:** DSCP classifying, prioritization and labeling for different M2M traffic flows transmitted through the VPN tunnel (*QoS-preclassify*) thus delivering the most critical service during network congestion.

- **Enterprise-grade management**
  - Operations, Maintenance and Administration for the REGESTA routers park using TeldaGES (massive upgrading and other programmable operations, router state reports, SNMP alarms service, etc.).
  - Proactive incident notification via Syslog and SNMP.
  - Text based command line interface (Teldat commands). Hierarchical system for the router professional management (advanced diagnostics, communications fine tuning, etc).
  - Simple configuration modification and cloning (from a single text configuration file).
  - Network clock synchronization.
  - Remote firmware and configuration upgrading via FTP.

## Characteristics: Hardware, Mechanical and Environmental

### Interfaces & Connectors
Up to 6 x 10/100 Fast Ethernet, RJ-45F
Up to 2 wireless broadband modules
2 x internal SIM trays (easy to access)
2 x SMA connectors for external antennas
1 x port for local console, RJ45F
Up to 3 x asynchronous serial ports, DB-9
Up to 1 ASDL2+ port, RJ11 H

### Hardware Architecture
2 status/speed LEDs per Ethernet port
2 wireless status/coverage LEDs
1 System LED (configurable)
1 on/off switch

### Local Console
RS-232 at 9600 bps (configurable max. 115200 bps)
8 bits without parity with 1 stop bit (8N1)

### FastEthernet Switch
10/100-BaseT automatic detection
Half/Full duplex automatic negotiation
MDI / MDI-X crossover detection
Ethernet V2 / IEEE 802.3
LLC (802.2), ARP
IEEE 802.1Q (VLAN)
IEEE 802.1X
Managed Switch:
- EtherLike-MIB (RFC 2665)
- SNMP-REPEATER-MIB (RFC 2108)
- MAU-MIB (RFC 2668)

### Internal 3.7G Interfaces
Passive detection when interface drops (analyzing received traffic)
Active detection when interfaces drop (poll)
Management protocol via SMS
Advanced monitoring of the radio interface.
Remote upgrading of module firmware over the air
Automatic handover
Internal SIM trays
Downstream speeds: up to 21 Mbps
Upstream speeds: up to 5.76 Mbps

### DSL2 Interface
Selected through the configuration of the following standards:
- G.993.2 (VDSL2)
- ANSI T1.413 Issue 2
- ITU G.992.1 (G.DMT) - Annex A
- ITU G.992.2 (G.Lite) "LiteADSL over POTS"
- ITU G.992.3 (ADSL2) - Annex A, L & M
- ITU G.992.5 (ADSL2+) - Annex A & M

SELT diagnostics ("Single Ended Line Testing")
DyingGasp
Annex B on demand, contact your dealer

### Serial Ports
Asynchronous
Up to 115200 bps
RTS/CTS flow control
PPP, M-PPP
SCADA (Modbus, IEC-101/102, gateway IEC-104)
RS-232 & RS-485 options available

### Environmental Specifications
Operating temperature: -10 / +60 °C
Relative humidity: 5% to 95%

### Dimensions and weight
Length x depth x height (without protectors):
186 x 203 x 47 mm
Length x depth x height (with protectors):
198 x 337 x 47 mm
Approximate weight: 680 g

### Power
From 20 up to 75 VDC (on selected models)
From 85 to 264 VAC (on selected models)
Possibility of supporting AC & DC currents on a single unit (40-75 VDC & 85-264 VAC)
Power consumption (max): 14 W

### Installation options
DIN rail
Table-top

## Software Characteristics

### IP Protocol

IP, ARP, Proxy ARP
Static IP Routing, RIP I, RIP II, OSPFv2, BGP-4 & Policy Routing
BFD Protocol
Compatible with HSRP
RFC 2281 VRRP – Virtual Router Protocol
VRF-Lite
Quality of backup: Routing based on network quality measurements
Multi-path per IP packet (with static & dynamic routing)
Weighted balancing per TCP/IP session
Multicast: IGMP, IGMP-proxy, MOSPF & PIM-SM*
DHCP client, server & relay
DNS client & proxy. DNS cache. Dynamic upgrades in DNS (RFC 2136)
SNAT/DNAT/NAPT. Visible subnets, Port Mapping
PAT fire-walling
Multiple addresses per interface
Loopback interfaces
IEC101 encapsulation
IP over asynchronous PPP on serial ports

### Security and VPNs

IPSec Client / Server. Fully parameterized, compatible with third party IPSec
IPSec security services: ESP & AH
IPSec operation modes: tunnel & transport
Encryption: RC4, DES, 3DES & AES
Authentication: SHA-1 & MD5
IKE protocol
ISAKMP. Oakley Groups 1, 2, 5, 15
NAT-Traversal
Reverse Route Injection (RRI)
Digital certificates X.509v3, LDAP, PKIX, PEM, DER
SCEP Protocol
Tunnel End-point Discovery Protocol (TED)
IPSec PMTU Discovery
GRE & multi-GRE. RC4 encryption in GRE tunnels
Next Hop Resolution Protocol (NHRP)
Dynamic Multipoint IPSec VPNs (DMVPN)
Gateway Encryption Transport VPN (GET VPN - GDOI) RFC 3547
Radius Access Control (RFC 2138)
L2TP client (LAC) & L2TP server (LNS)
L2TP/IPSec Server, compatible with Microsoft clients
Advanced IP filters
Advanced Firewall System (AFS)
Statefull Firewall
Advanced packet classification and marking
URL & content filtering
MAC filtering per port and per VLAN

### Data compression

X.25 & PPP compression
IPHC compression
Van Jacobson & STA LZS compression algorithm

### Specific WWAN functions

Automatic Hand-over
WWAN service passive fault detection
Active detection of interface drops based on polls
WWAN interface advanced real time monitoring
Connected dual SIM with multiple selection criteria: Signal level, GPRS availability in service area, IP-GPRS communication quality (packet error rate, latency, jitter)
Dual PDP context for simultaneous connection to two APNs
OTA firmware upgrading

### Management

Teldat commands console with local (serial port) and remote (telnet, ssh) access for advanced router management
SNMPv1/2/3, MIB2 Agent, Teldat MIB
Syslog Client
NTP Protocol
DynDNS Client
FTP & TFTP Software, BIOS & configuration upgrading
Internal Protocol Analyzer, compatible with Ethereal /WireShark
Default configuration reset knob
Radius Accounting (RFC 2139)
Integrated in Teldages (Teldat professional management platform)

### Quality of Service (QoS)

Packet tagging (DiffServ) per interface, subinterface, protocol, port and MAC
Congestion control: FIFO, queue priorities, BRS proprietary system, WFQ
Low Latency Queuing (LLQ)
Traffic shaping: proprietary (over BRS), ATM traffic shaping, Frame Relay traffic shaping
QoS-Preclassify
Fragmentation in FR (FRF.12), PPP & MPPP

### Protocols PPP & PPPoE

PPP (RFC 1661), PAP/CHAP, IPCP
Multilink PPP
Multi-Class Extension a Multi-Link PPP (RFC 2686)
PPPoEoE, PPPoE Bridge + routing (PPPoE pass-through)
Multilink PPP over PPPoE
Renegotiation based on PADT

### Bridge

Bridge over PPP (BCP)
STP "Spanning Tree Protocol" (IEEE 802.1d)
RSTP "Rapid Convergence Spanning Tree Protocol"(IEEE 802.1w)
Multiple bridge domains
Simultaneous bridging & routing
IEEE 802.1p CoS ("Class of Service")
PVST ("Per VLAN Spanning Tree Protocol")*
Source Routing, MAC filtering & NetBIOS

## Certifications include

- **Insulation**
  - **UNE-EN 60255-5**
    - **Electric strength**
    - **Insulation resistance**
    - **Insulation with voltage impulses**
- **Immunity**
  - **UNE-EN 61000-4-2 Level 4 Crit. A**
  - **UNE-EN 61000-4-3 Level 3 Crit. A**
  - **UNE-EN 61000-4-4 Level 4 Crit. B**
  - **UNE-EN 61000-4-5 Level 4 Crit. B**
  - **UNE-EN 61000-4-6 Level 3 Crit. B**
  - **UNE-EN 61000-4-8 Level 5 Crit. A**
  - **UNE-EN 61000-4-10 Level 5 Crit. A**
  - **UNE-EN 61000-4-12 Level 3 Crit. A**
  - **UNE-EN 61000-4-13 Level 3 Crit. A**
  - **UNE-EN 61000-4-18 Level 3 Crit. A**
- **Electrical**
  - **UNE-EN 61000-4-11 Class 3 Crit. A**
  - **UNE-EN 61000-4-29**
- **Climatic**
  - **UNE-EN 60068-2-78 10/060/04 40ºC,93%, Crit. A**
  - **UNE-EN 60068-2-2 10/060/04 Crit. A**
  - **UNE-EN 60068-2-1 0/060/04 Crit. A**
  - **UNE-EN 60068-2-14 10/060/04 Crit. A**
- **Mechanical**
  - **UNE EN 60 870-2-2**
  - **UNE EN 60 068-2-6 Environmental Class 2.3, Crit. A**
  - **UNE EN 60 068-2-27 Environmental Class 2.3, Crit. A**

Please inquire regarding further certifications passed.

## TELDAT DOCUMENTATION

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