

## Substation gateway and RTU

INGESAS™ IC3 consists of a high-performing **gateway** designed for substation environments, providing high reliability and availability thanks to the various **redundancy** mechanisms that it offers.

Its main functions are as follows:

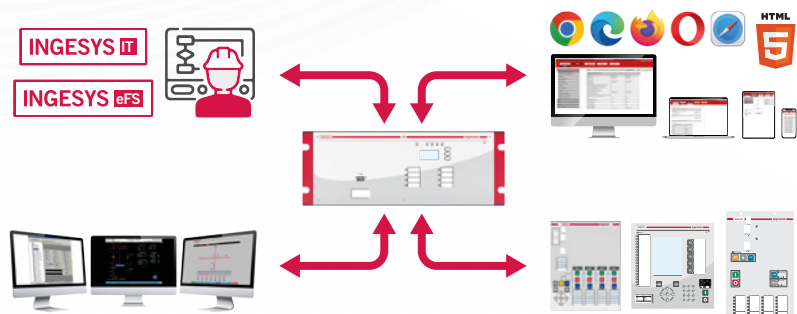
- **Collecting all the substation information** (alarms, states, measurements, counters, etc.) and sending it to different control centres, following telecontrol standards.
- **Receiving commands and set points** from different telecontrol centres and transmitting them to the corresponding IEDs.
- **Performing general logic operations** at substation level, receiving the necessary information from the IEDs at bay level.
- **Developing these logic operations** using IEC 61131-3 compliant tools.
- **Providing the latest cybersecurity features:** firewall, cryptographic techniques, role-based access, user accounts control, etc.
- **Acting as a synchronisation pattern** for all the devices connected to the communications network via the IEEE 1588, IRIG-B, SNTP or telecontrol protocols.

### Applications

- Power grid transmission and distribution
- Renewable substations

### Protocols

- IEC 61850 Client and Server
- IEC 60870-5-101 Master and Slave
- IEC 60870-5-104 Client and Server
- IEC 60870-5-103 Master
- DNP 3.0 Master and Slave
- MODBUS RTU / TCP Master and Slave
- PROCOME Serial and TCP Master
- OPC-UA Client and Server



## INSULATION AND ELECTROMAGNETIC TESTS

Electromagnetic compatibility requirements	IEC 60255-26
Dielectric withstand	IEC 60255-27
Insulation resistance measurement	IEC 60255-27
Voltage impulse	IEC 60255-27
Electrostatic discharge immunity	IEC 61000-4-2
Radiated radiofrequency electromagnetic field immunity	IEC 61000-4-3
Electrical fast transient / burst immunity	IEC 61000-4-4
Surge immunity	IEC 61000-4-5
Immunity to conducted disturbances, induced by radiofrequency fields	IEC 61000-4-6
Power frequency magnetic field immunity	IEC 61000-4-8
Impulse magnetic field immunity	IEC 61000-4-9
Damped oscillatory magnetic field immunity	IEC 61000-4-10
Immunity to conducted, common mode disturbances	IEC 61000-4-16
Ripple on DC input power port	IEC 61000-4-17
Damped oscillatory wave immunity	IEC 61000-4-18
Voltage dips, short interruptions and voltage variations immunity	IEC 61000-4-29
Withstand to radiated electromagnetic interference from transceivers	IEEE 37.90.2

## CLIMATIC TESTS

Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Change of temperature	IEC 60068-2-14
Damp heat cyclic	IEC 60068-2-30
Damp heat steady	IEC 60068-2-78
External protection level	IEC 60529

## MECHANICAL TESTS

Vibrations	IEC 60255-21-1
Shock and bump	IEC 60255-21-2
Seismic	IEC 60255-21-3



## MAIN FEATURES

Can be configured with IEC 61850 compliant tools

One single device makes it possible to centralise all of the information for different main telecontrol centres, whilst also managing different protocols

The information sent to each telecontrol centre can be configured

Logic programming is carried out using IEC 61131-3 compliant tools

Allows redundancy in devices (hot-hot, hot-standby and hot-warm), communications (PRP/HSR) and power supply, improving the overall availability of the system

Easily expandable database, being possible to add new IEDs to the system simply and securely

Provides an embedded HTML5 web server to display all information collected from IEDs and INGESAS™ IC3 data, in user-defined dashboards that can include dynamic graphical objects, historical event listing and alarm management

Different mechanisms for accessing to the information: front USB port, sFTP or HTTPs

All access follows cybersecurity standards and requires user identification

The device incorporates a firewall functionality through which any port communication can be blocked

## CYBERSECURITY

It uses secure communications protocols, guaranteeing the integrity and confidentiality of communications: HTTPs, SSH/sFTP, Secure Syslog, Secure LDAP, Secure DNP, OPC UA

It uses certificates to encrypt communications and checks the validity of firmware, etc.: HTTPs, SSH, VPN

It only uses encryption algorithms considered secure

Hardening

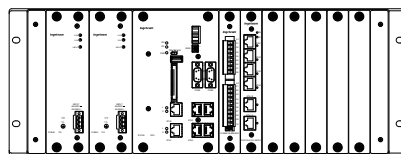
RBAC: users and sessions management (IEEE 1686, IEC 62351-8 standards)

Auditory

## HARDWARE OPTIONS

### Mounting options

- 19" 4U rack with display



### Boards options (up to 7 slots)

- 8 DI + 4 DO
- 6 PRP ports: RJ45, FO
- 6 HSR ports: RJ45, FO
- 3 serial ports: RS232/485

### Power supply

- 48, 125 and 220 Vdc
- Optionally redundant power supply

### Optional

- For projects that require a specific hardware configuration, INGESAS™ IC3 can be supplied embedded in an industrial PC with the same functionality

### CPU

- USB front port
- 4 Ethernet ports, 2 individual and 2 switched with 2 inlets each (6 connectors)
- 2 RS232/RS485 serial ports
- 11 signalization LEDs, plus 5 status LEDs