



iRTU

A compact device, designed to **solve** any communication challenges in the network.

- > **Adaptable and modular Remote Telecontrol Units** suitable for all environments.
- > **Full range of protocols (DNP3.0, IEC 61850, IEC 60870-5...)** to communicate with all devices and control centers.
- > **Embedded Ethernet switch with 10/100 BaseTx, FX100 fiber optics** and **RSTP/ PRP/ HSR** redundancy.
- > The **Hot-Standby** and **Hot-Hot** architectures of the **iRTU** ensure high availability and operational continuity, enabling automatic or manual switchover between redundant units without data loss or service interruption.



Simple IEC 61850 Integration

Our scalable iRTUs can simultaneously handle older and newer protocols on serial and Ethernet networks - making substation automation less complex and more affordable.

Our modular iRTUs are powerful controllers with embedded ethernet switches, state-of-the-art features and internal I/Os, allowing you to do it all with one small device. They can map serial servers to IEC 61850 logical nodes, collect and process data from old and new IEDs, report directly to the control center with any standard protocol (e.g. IEC 60970-5-104, DNP3) and handle all common protocol conversions.

An architecture based on iRTUs is open and scalable: you can easily integrate future generations of devices (IEDs, sensors, routers etc.) and adapt to any present and future needs, such as changing network topology or communication media.



COMMUNICATION PROTOCOLS & IP NETWORKING

The iRTU was designed to use a high number of protocols and communicate with several control centers at once.

It is equipped with transparent TCP bridging and configurable IP routing to tunnel any serial protocol (such as Modbus) over a TCP/IP connection and facilitate the control of complex IP networks.

The iRTU IEC 61850 client capabilities have been A level certified by DNV-KEMA.



COMMUNICATION PORTS

The iRTU comes with 2 independent 10/100 BaseTX Ethernet ports (two different MAC addresses). iRTU-S series use one of these ports to extend the number of ports with an internal switch to provide RSTP/PRP/HSR redundancy, Redbox function and fiber optic ports.

Additionally, the iRTU carries (4) software configurable serial ports to connect iRTUe models:

(1) full RS-232 (8 signals)/RS-485/RS-422 + (3) basic RS-232 (TX,RX,RTS,CTS)/RS-485/RS-422 and (1) RS-422/RS-485 port for iRTUe I/O modules expansion.



IEC 61131-3 PLC AUTOMATION

Thanks to its internal PLC based on IEC 61131-3, the iRTU can provide powerful automation and control functionalities.

For example, you can easily reuse programs on different projects, run multiple PLC instances simultaneously or use triggered variables for control commands and set points. It also allows to run hot program updates, stop PLC executions depending on the quality of selected PLC inputs and debug PLCs online, either cycle-by-cycle or step-by-step.

The iRTU has a high execution speed – a 2000 ST lines program takes less than 3ms.



IRTU REDUNDANCY ARCHITECTURE

The iRTU device supports both Hot-Standby and Hot-Hot redundancy architectures to ensure high system availability, fault tolerance, and uninterrupted operation. Automatic switchover logic can be customized depending on the system needs.

Hot-Hot mode enables parallel operation and ensures seamless failover with realtime synchronization, while Hot-Standby allows to implement redundancy in any kind of system.



TIME MANAGEMENT

The iRTU manages a broad range of time synchronization methods with fault tolerant priority schemes (NTP, IEEE-1588/ PTP, IEC60870-5-101, DNP 3.0) to ensure that your network is synchronized and you can retrace any network failures.

The time stamp accuracy of the iRTU is superior to one 1ms and has a 1 microsecond resolution. In case the time server fails, the iRTU can rely on its high accuracy real time clock (1.5ppm) as a backup.



CYBER SECURITY – IEC 62443 & IEC 62351

iGrid enforces several layers of security measures guided by the propositions of the IEC 62443 and IEC 62531 standards to protect its devices from all kinds of threats.

The iRTU is a hardened device featuring Role Based Access Control (RBAC) to avoid intrinsic risks such as security holes and unauthorized actions by authenticated users. Beyond encryptions via TLS/SSL, HTTPS, SSH and VPN support (e.g. OpenVPN), its communication can also be secured with network control methods such as firewalls, IP filters, ACL or TCP port blocks.



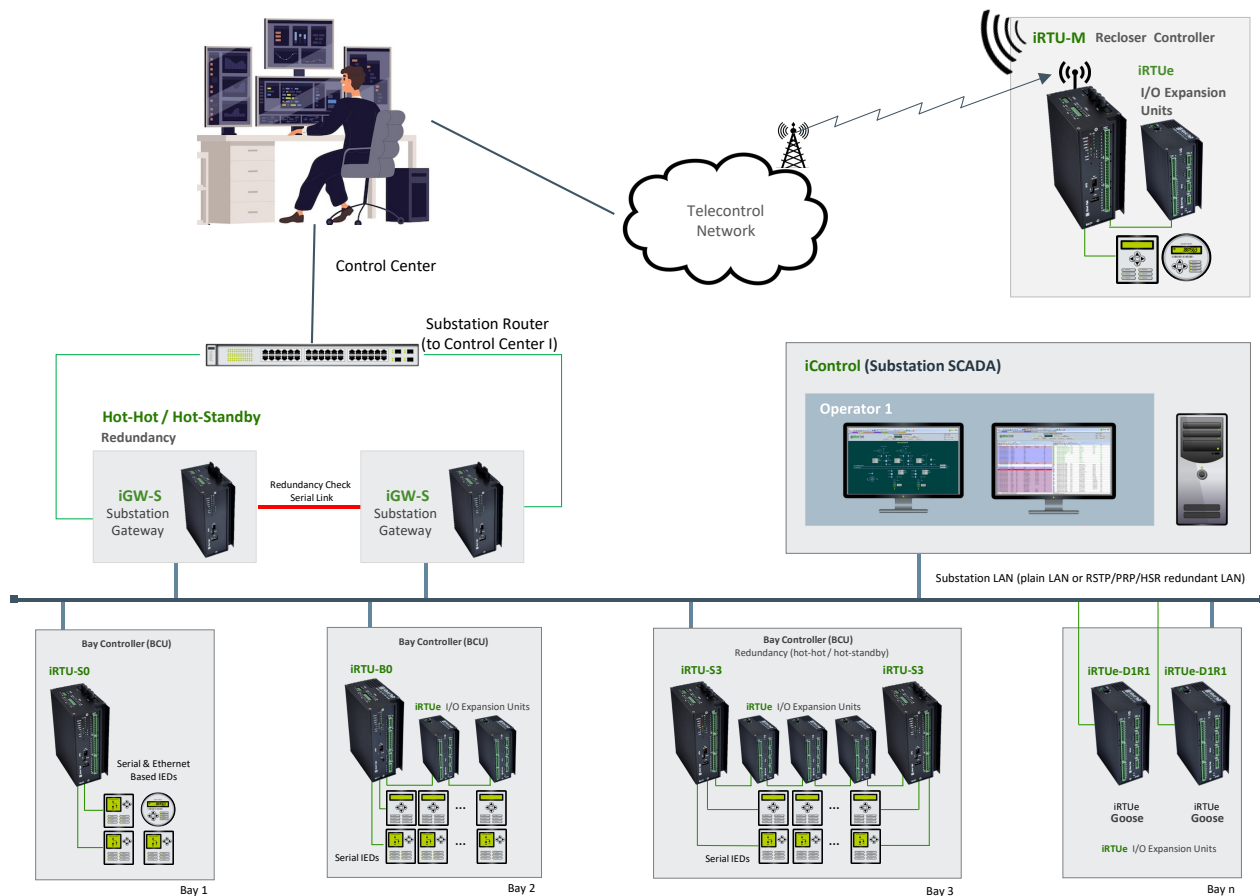
INPUTS AND OUTPUTS

iRTUs are equipped with internal I/O modules for direct data acquisition and feature a 2.5kV isolation. The **DIs** can be chosen in 4 voltage levels (or customized) and grant a 1 ms timestamp accuracy. Each input can also be defined as a counter and provide individually configurable debounce and decluttering filters. Its **AIs** have a current range of ± 20 mA (other voltages and currents upon request) and a 0.15% accuracy.

The iRTU also offers internal dry contact electromechanical relay outputs in several ratings and with an isolation of 2.5 kV.

CONFIGURATION WITH iCONF

The **iRTU** features **iConf**, a powerful configuration tool tailored for electrical automation systems. It simplifies setup and maintenance, reducing engineering time, costs, and project risk. **iConf** supports uploading/downloading configurations, importing or scanning SCL (IEC 61850) files, and creating reusable templates—enabling faster deployments while ensuring consistency and reliability across multiple installations or projects.

**SUBSTATION SCHEMA WITH iRTU FUNCTIONING AS BAY CONTROLLER UNIT****iRTU (B, S, M) SERIES COMMON FEATURES****GENERAL**

(4) Software configurable serial ports with LEDs:

- **(1)** Full RS-232/ RS-422/ RS-485 serial port
- **(2)** Basic RS-232/ RS-422/ RS-485 serial ports
- **(1)** RS-422/ RS-485 serial port (EXP-422 port*)

(1) USB port to connect peripheral devices

(1) MGMT port (MiniUSB connector) for local maintenance

(1) internal MicroSD slot for up to 16 Gb of data storage

*for iRTUe connection

INTERNAL I/O CONFIGURATIONS

D1 – 24 digital inputs

C1 – (8) digital inputs, (4) relay outputs, and (2) DC current analog inputs (4-20mA)

C2 – 8 digital inputs + 4 relays

C3 – (8) digital inputs, (4) relay outputs, and (2) RTD PT100 temperature inputs

CAPABILITIES**iRTU-B**

(2) 10/100BaseTX Ethernet ports (RJ45 connector)

iRTU-S

The **S Series** carries the B0 ports, replacing one of the two independent Ethernet ports with an embedded Ethernet switch, which provides:

S0 – (3) 10/100BaseTX RJ connectors (2) FX100 ports with HSR/PRP redundancy and SC, ST or SFP connectors

S3 – (2) 10/100BaseTX RJ connectors and (2) FX100 ports with RSTP redundancy and SC, ST or SFP connectors

iRTU-M

The M series replaces one of the serial ports with an internal modem.

M3 (LTE Cat 1 (4G) with 2G/3G fallback)



PROTOCOL STACK

Master DLMS	Master Spabus	Slave OPC UA Client
Master IEC 60870-5-102	Master/Slave IEC 60870-5-101	SNMP Agent/Manager
Master IEC 60870-5-103	Master/Slave IEC 60870-5-104	TASE2.0/ICCP
Master IEC 62056-21	Master/Slave ModbusRTU	IEC 61850 MMS Client/Server
Master Procome	Master/Slave OPC UA	Master/Slave MQTT*
Master/Slave DNP3.0 (serial, UDP, TCP)	IEC 61850 GOOSE Publisher/Subscriber	Master/Slave Modbus TCP/UDP and JBUS (master)

*Implementation of non standard packaged data payload under quotation

IGCOMMS SOFTWARE APPLICATION

Redundancy deployable on a Hot-Standby and Hot-Hot configuration.

Security IEC 62443-4-1, IEC 62443-4-2, IEC 62351-3, IEC 62351-8 and IEC 62351-5 support, including TLS/SSL, SSH and VPN connections.

IEC 61131-3 automation logic and PLC programming, with LD, IL, FBD, ST and SFC editor.

LUA language can be used to create simple and complex logic and mathematical expressions.

COMMUNICATION PORTS & CPU

Serial up to 4 software configurable ports with RS-232/RS-485/RS-422

Ethernet (B Series) (2) 10/100BaseTX ports with two independent MAC addresses.

Ethernet switch (S Series) up to (4) 10/100BaseTX ports with RJ45 connection and (2) FX100 with ST, SC connectors or SFP interface, and supporting RSTP, HSR and PRP redundancy.

Modem: LTE Cat 1 global worldwide connectivity with 2G/3G/4G .

CPU ARM Cortex-A7 @ 528MHz, with 128 MBytes Flash and 256MBytes RAM.

RELAY OUTPUTS

Isolation 5 KVRms (between contact and coil)

Contact Dry

Connectors MVSTBR 2.5, 4-pin connectors for grouping 2 outputs blocks

Breaking Capacity 8A @ 220Vac – 8/8/1/0.4A @ 24/48/125/220Vdc

CONFIGURATION & MAINTENANCE

Easy configuration with iConf tool

Internal web server, allowing real time monitoring of the system and all its internal parameters

Command console with full information on packet exchanges, with all available protocols

Local or remote maintenance via USB or Ethernet port

Fault relay to indicate device operational status.

GENERAL CHARACTERISTICS

Power supply 24 : 19.5-60 Vdc (2.5kVrms isolation)

Power supply W : wide range, 32 - 250 Vdc (2.5kVrms isolation)

MTBF 177,000h (one hundred seventy-seven thousand hours)

Physical External dimensions: 173 x 78.4 x 137 mm (H x W x D)
IP30 enclosure with DIN Rail mounting

Operating temperature : -25°C to +70°C

EMC STANDARDS

- IEC 61000-4-2
- IEC 61000-4-3
- IEC 61000-4-4
- IEC 61000-4-5
- IEC 61000-4-6
- IEC 61000-4-8
- IEC 61000-4-9
- IEC 61000-4-10
- IEC 61000-4-12
- IEC 61000-4-16
- IEC 61000-4-17
- IEC 61000-4-18
- IEC 61000-4-29
- CISPR 32

ENVIRONMENTAL STANDARDS

- IEC 60068-2-1
- IEC 60068-2-2
- IEC 60068-2-14
- IEC 60068-2-30
- IEC 60068-2-38
- IEC 60068-2-78

VIBRATION & SHOCK TEST STANDARDS

- IEC 60068-2-6
- EN 60068-2-27
- EN 60068-2-64
- EN 60255-21-1
- EN 60255-21-2

SAFETY STANDARDS

- IEC 60255-27

RTC & TIME SYNCHRONIZATION

Real-time Clock (RTC) with 1.5 ppm drift and microsecond resolution timestamp

Client IEEE 1588(PTP), SNTP, IEC 60870-5-101, IEC 60870-5-104, DNP3.0

Server IEEE 1588(PTP), NTP, IEC 60870-5-101, IEC 60870-5-102, IEC 60870-5-103, IEC 60870-5-104 DNP3.0, DLMS, Spabus and Procome

ORDERING INFORMATION

iRTU-**b#bb****ii****vv****www****ff****s**

MAIN BOARD & COMMUNICATIONS

- B#01** (2) 10/100BaseTX RJ45 Ethernet + (4) serial RS232/RS485/RS422 ports
- S#01** PRP/HSR switching, (4) 10/100BaseTX, (2) FX100 Ethernet, (4) serial RS232/RS485/RS422 ports
- S#31** RSTP switching, (3) 10/100BaseTX, (2) FX100 Ethernet, (4) serial RS232/S485/RS422 ports
- M#31** LTE Cat 1 (4G) global worldwide connectivity with 2G/3G fallback, (2) 10/100BaseTX RJ45 Ethernet, (3) serial RS232/RS485/RS422 ports

I/O BOARD

- D1** (24) digital inputs
- C1** (8) digital inputs + (4) relays + (2) 4-20mA DC analog inputs
- C2** (8) digital inputs + (4) relays
- C3** (8) digital inputs + (4) relays + (2) PT100/RTD analog inputs

POWER SUPPLY

- 24** 19.2-60 Vdc
- WV** 32-250 Vdc / 80-230 Vac

SD CARD

- O** No SD memory
- S** Internal industrial grade 16GB microSD card (32GB on demand)

FIBER OPTICS (S MODELS)

- O** No fiber optic connectors
- T** ST connectors
- C** SC connectors
- F** SFP interface

DIGITAL INPUTS VOLTAGE

- 024** 24 Vdc digital inputs
- 048** 48 Vdc digital inputs
- 125** 110-132 Vdc digital inputs
- 220** 220 Vdc digital inputs