



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 (2) 10/100 BaseTx, (2) FX100 fiber optics and RSTP/ PRP/ HSR redundancy**
- > **Up to 4 Ethernet ports, 4 serial ports, and optional, internal 4G, 3G and GPRS modems**



IEC Simple IEC 61850 Integration

Our scalable RTUs can simultaneously handle older and newer protocols on serial, wireless 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 PORTS

The iRTU comes with 2 independent 10/100 BaseTX Ethernet ports (two different MAC addresses, RJ45 connector) and an internal Ethernet switch with (2) 10/100BaseTX, (2) fiber optic FX100 sensors with ST, SC or SFP connectors, and RSTP/PRP/HSR redundancy.

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

1 full RS-232/RS-485/RS-422 + 2 basic RS-232/RS-485/RS-422 and 1 RS-422/RS-485 port (EXP422)

Optionally, one of the serial ports can be replaced with an internal 4G/LTE, 3G and GPRS modem.

STANDARDS AND COMPLIANCE

The diverse backgrounds of our partners and clients from all over the world have helped us gather state-of-the-art know-how and firsthand experience in a great variety of energy applications. This joint knowledge is the foundation of our optimized iRTU family, which has a proven track record of being particularly effective and resistant for a diverse range of applications and harsh environments belonging to the energy industry.

As a result, the iRTU meets and exceeds many requirements of extensive standards, such as IEC61850-3, IEC60870-2-1 & IEC60255-26.

TIME MANAGEMENT

The iRTU manages a broad range of time synchronization methods with fault tolerant priority schemes (*NTP*, *IEEE1588/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.

COMMUNICATION PROTOCOLS & IP

The iRTU was designed to use a high number of protocols (see data sheet) 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* capabilities have been A level certified by DNV-KEMA.

IEC61131-3 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 line program takes less than 3ms.

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 6 kV.



Even smaller, but just as smart.

The iGWlite is a special device for protocol conversion and other gateway functionalities. It almost takes no space on a DIN-Rail, but still employs the full iGrid protocol stack. It carries 1 Ethernet & 1 RS485/RS422 port and can be equipped with an optional RS232 port (copper or fiber) or a 2G/3G/4G modem.

It is the first gateway worldwide to handle TASE 2.0 to directly connect smaller generation plants with transmission control centers.

More specifications on the back

IRTU B0 SERIES

- (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*)
- (2) 10/100BaseTX Ethernet ports (RJ45 connector)
- (1) USB port to connect peripheral devices
 - (1) MGMT port (MiniUSB connector) for local maintenance

*for iRTUe connection

IRTU S SERIES

The S Series carries the B0 ports and an embedded Ethernet switch (connected to one of the two independent Ethernet ports), 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

M SERIES

The M series replaces one of the serial ports with an internal modem: **M0** (GPRS), **M1** (3G + GPRS) and **M2** (4G/LTE + GPRS)

INTERNAL I/O CONFIGURATIONS

iGW S/M/B Series: no I/Os, same ports as iRTUs

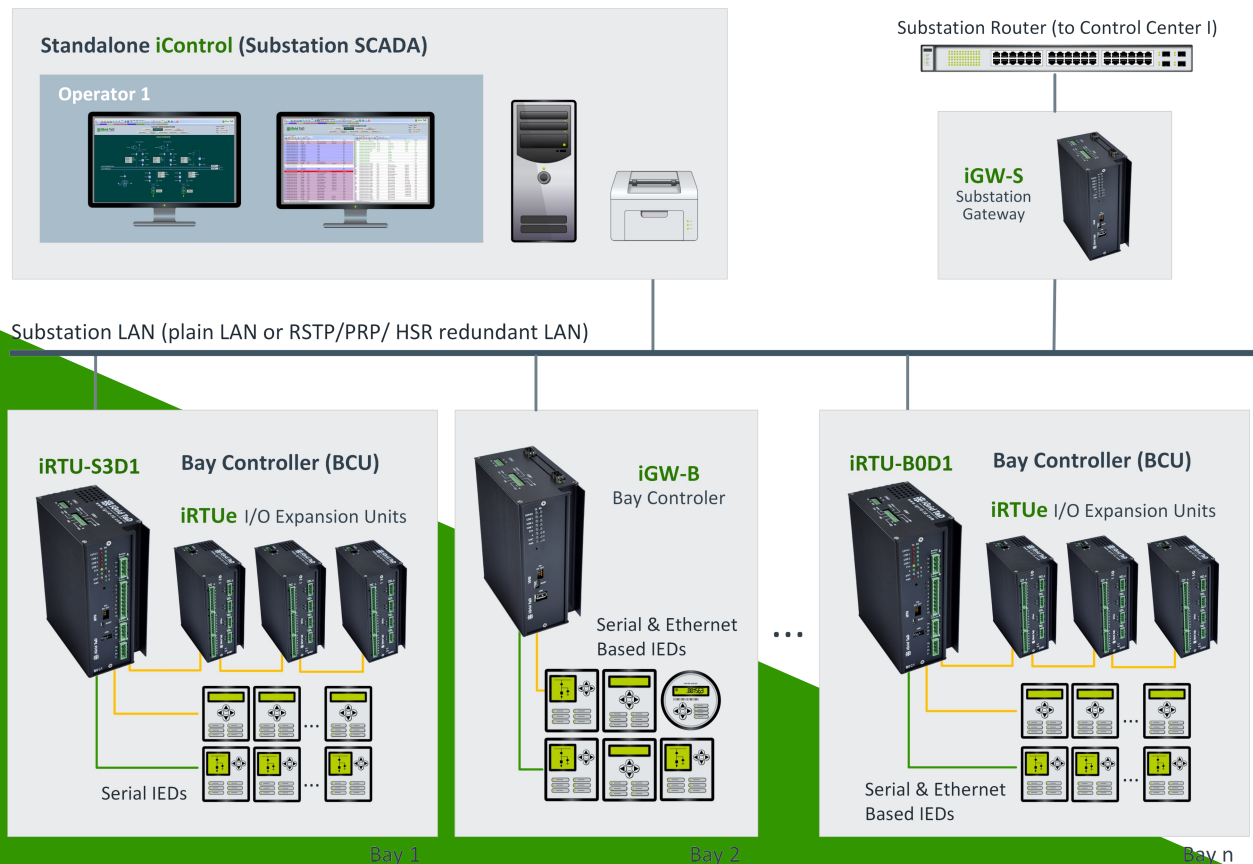
C1 – (8) digital inputs, (4) relay outputs, and (2) DC current analog inputs (4-20mA)

D1 – 24 digital inputs

IRTUE – REMOTE I/O EXPANSIONS

iRTUs and iGWs can be freely extended by connecting several iRTUe. They support **IEC 61850 GOOSE** messaging and come in many configurations such as: 48 DI (D1D1), 16 relays (R1R1), 16 AI (A1A1), 24 DI + 8 relays (D1R1), 24 DI + 8 AI (D1A1) or 8 relays + 8 AI (A1R1).

SUBSTATION SCHEMA WITH IRTU FUNCTIONING AS BAY CONTROLLER UNIT



PROTOCOL STACK

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

IGCOMMS SOFTWARE APPLICATION

Redundancy deployable on a hot-standby configuration, optional redundant power supply

Security IEC 62351-3 and IEC 62351-5 support, including TLS/SSL, SSH and VPN connections

IEC 61131-3 automation logic and PLC programming, with LD, 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 (2) 10/100BaseTX ports with independent MAC addresses

Wireless full internal 4G(LTE), 3G and GPRS modem (optional)

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 configurations

CPU ARM Cortex-A7 @ 528MHz, with 4GBytes Flash and 256MBytes RAM.

EMC STANDARDS

IEC 60950-1, IEC 60255-5:2000, IEC 60255-22:2000, EN 55022, IEC 61000-6-4, IEC 61000-6-5, 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

GENERAL CHARACTERISTICS

Power supply **W** : wide range, 32 - 250Vdc / 80 - 250Vac (2.5kVrms isolation) **24** : 19.5-60Vdc (2.5kVrms isolation)

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

Environmental Operating temperature : -25°C to +70°C
IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-3, IEC 60068-2-14, IEC 60068-2-30, IEC 60068-2-38

Vibration & shock test IEC 60068-2-6, IEC 60068-2-7

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

RTC & TIME SYNCHRONIZATION

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

Server NTP, IEC 60870-5-101, IEC 60870-5-104, DNP3.0, PTP

Client IEEE1588(PTP), SNTP, IEC 60870-5-101, IEC 60870-5-102, IEC 60870-5-103, IEC 60870-5-104 DNP3.0, DLMS, Spabus, Mlink, Procome and Profibus DP

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

ORDERING INFORMATION

iRTU-b#bbiivvwwfs

MAIN BOARD & COMMUNICATIONS

B#01 (2) 10/100BaseTX RJ45 Ethernet + (4) serial RS232/RS485/RS422 ports

S#01 PRP/HSR switch with (4) 10/100BaseTX and (2) FX100 Ethernet + (4) serial RS232/RS485/RS422 ports

S#31 RSTP switch with (3) 10/100BaseTX and (2) FX100 Ethernet + (4) serial RS232/RS485/RS422 ports

M#01 2G modem + (2) 10/100BaseTX Ethernet + (3) serial RS232/RS485/RS422 ports

M#11 3G modem + (2) 10/100BaseTX Ethernet + (3) serial RS232/RS485/RS422 ports

M#21 4G modem + (2) 10/100BaseTX 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

POWER SUPPLY

24 19.2-60 Vdc digital inputs

WV 32-250Vdc // 80-250Vac

SD CARD

S Internal 8 GB microSD card

FIBER OPTICS (S MODELS)

O No fiber optic connectors

T ST connectors

C SC connectors

F SFP interface

DIGITAL INPUTS VOLTAGE

024 24Vdc digital inputs

048 48Vdc digital inputs

125 125Vdc digital inputs

132 132Vdc digital inputs