



## Remote control and monitoring Device of Secondary Substation

*In compliance with  
Enel DX1215 Ed.7  
Enel DX1222 Ed.3*

### General Information

The UP2008-OUTDOOR is the remote control Peripheral Unit for secondary substations and Medium Voltage (MV) power distribution system.

Main functions of the UP2008-OUTDOOR are:

- Remote control and Automation of 8 Secondary substation switchgear
- Permanent Fault detection
- Monitoring of Medium Voltage Power Grid.

The UP2008-OUTDOOR allows to create the communication system between field and The Distribution Control Centre. In particular:

- Receives and carries out commands sent by the Distribution Control Centre (Remote Control).
- Sends field collected informations (remote signaling and telemetry) to the Distribution Control Centre side.

These functions allow to guarantee High Level Reliability of Electric Power Distribution system, reducing the number and the duration of power outages caused by circuit faults.

Furthermore, Remote Control permits optimization of electric power distribution system maintenance and planning policies.

The UP2008-OUTDOOR is made by two components integrated in a metal cabinet:

- **The UE8 module:** is the unit of data acquisition, monitoring, transmission, and processing. The UE8 is the field interface also. The UE8 is completely remote programmable by personal computer.
- **The ACB module:** includes a power supply and a battery system with charger circuit. The ACB supplies the power to UE8, to communication device called DCE and to motors of Switchgear connected to the UP. The Battery system is made by two Lead-acid rechargeable batteries and the ACB monitors its functional states. The ACB is completely programmable from personal computer by local communication port.

### Main features

Extensive range regarding Remote Control of Electric Power Distribution System features.

Acquisition, processing and collection of the Switchgear states.

Managing of fault-detection automation

Archiving of electric power distribution system data management and of chronological events (fault, voltage failure, etc) trend.

Processing of field signals correlation for generating signs to the Distribution Control Centre.

Validation and dispatch of commands from the Distribution Control Centre to Switchgear.

Communication with the Distribution Control Centre technologies:

- GSM/GPRS/UMTS
- Public Switched Telephone Network (PSTN)
- Network LAN/WAN IP based

Communication Protocols:

- IEC 60870-5-101
- IEC 60870-5-104

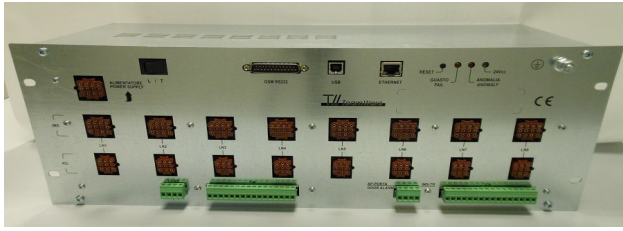
Management of diagnostic of failure devices with issue of local and remote warnings

Monitoring of Secondary Substation temperature through dedicated sensor and managing of door opening warning.

Power supply to the automation components of secondary substation.

# Technical features

## The UE8 Module



### Input/Output Interface

#### **49 Remote signals (TS):**

- galvanically optocoupled digital input
- sampling: 10msec

#### **16 Remote commands (TC):**

- Relay output with 1 / N of the uniqueness control of the carrying out, execution policy in double safety and evaluation of the value of the output load impedance.
- nominal current: 5A
- interruption rate: 0,5A @ 110 Vcc with L/R = 40msec.

#### **8 Telemetry (TM):**

- differential analog inputs galvanically isolated
- input impedance: 50ohm
- measure range:  $\pm 5\text{mA} \text{ e } 4\pm 20\text{mA}$
- precision: 1%FS
- resolution: 12bit

#### **8 Digital Output (UD):**

- open collector (source) output galvanically isolated (max current 50mA)

### Communication ports

There are three communication ports:

- 1 Ethernet Port 10/100BaseT (available both as LAN/WAN interface and as configuration and local monitoring port)
- 1 serial Port V.24 (interface to external DCE device dedicated)
- 1 USB 2.0 device Port (configuration and local monitoring dedicated)

### Power Supply

The UE8 module is powered by the main source with:

- Nominal voltage: 24Vcc  $\pm 20\%$

The Hardware is powered by the secondary source galvanically isolated from the main.

### Visual indicators

There are three leds signs:

- Fatal failure
- General anomaly
- Main source presence

### Connections

- Ethernet interface: RJ45 connector
- V.24 serial interface: DB25 connector with male poles
- USB local interface: B type connector
- 8 female connectors with 9 poles for connections to RG device
- 8 female connectors with 12 poles for connections to Switchgears
- 1 female connector with 12 pole for connections to the ACB module
- 1 extractable terminal board with 16 poles for connections to remote signals (TS)
- 1 extractable terminal board with 16 poles for connections to Telemetry

- 1 extractable terminal with 4 poles for connections to temperature sensor of the substation
- 1 extractable terminal with 4 poles for connections to particular remote signals :
  - Door Opening
  - IMS TR Opening

### Mechanical features

The module is contained in a standard rack box 19" 4U

## The ACB Module



Main electric features are:

### Main source voltage:

100/230 V<sub>AC</sub> (-10% ÷ +20%),

setting up by dedicated selector.

### Nominal frequency: 50/60Hz

### Power: 150W

The secondary power sources are:

### Output of battery charger and load power:

- Nominal Voltage: 24V<sub>DC</sub> set between 23 and 28 V<sub>DC</sub> balanced also in function of the battery temperature
- Maximum available current (fixed): 5A  $\pm 5\%$

### Power supply Auxiliary output:

- Nominal Voltage: 12 V<sub>DC</sub>
- Maximum available current (fixed): 1 A

### Whole efficiency:

$\geq 75\% \pm 3\%$

(calculated at maximum supplied current 5A and at nominal voltage of 24V<sub>DC</sub>)

### Visual indicators

There are five leds signs:

- Main source presence
- Secondary source presence
- Secondary voltage low level
- Secondary voltage maximum level
- Battery failure

### Connection and optionals

- USB local interface: type B connector
- 1 female connector with 9 poles for connection to batteries and external modem
- 1 female connector with 12 poles for connection to the UE8 module
- 1 three-poles socket for the main power supply
- 1 bipolar circuit breaker for IO: 2A type loads
- 1 Thermal magnetic circuit breaker with auxiliary contact: 20A C curve
- 2 fuse holders with fuses of main grid protection: 3,15AT.
- 1 fuse holder with fuse 20AT of battery output protection

### Mechanical features

The module is contained in a standard rack box 19" 3U

## EMC

### Emissions

EN55022 Class A

### Immunity

EN61000-4-8:	Level 5
EN61000-4-10:	Level 4
EN61000-4-3:	Level 4
ENV50204:	Level 4
EN61000-4-2:	Level 4
EN61000-4-16:	Level 3
EN61000-4-6:	Level 3
EN61000-4-12:	Level 3
EN61000-4-18:	Level 3
EN61000-4-4:	Level 3
EN61000-4-5:	Level 3

## Environmental conditions

Operating temperature:	-10 ÷ +55°C
Storage temperature:	-25 ÷ +70°C
Humidity:	93%

## IP Grade

EN60529-1 compliant: IP54

## Configuration software

UP2008-OUTDOOR is accompanied by a configuration application program that runs under Windows ©. It allows the configuration of the UP both remotely and locally.

Local configuration must be performed with a personal computer, connected to the UP via USB 2.0 or through an Ethernet interface.

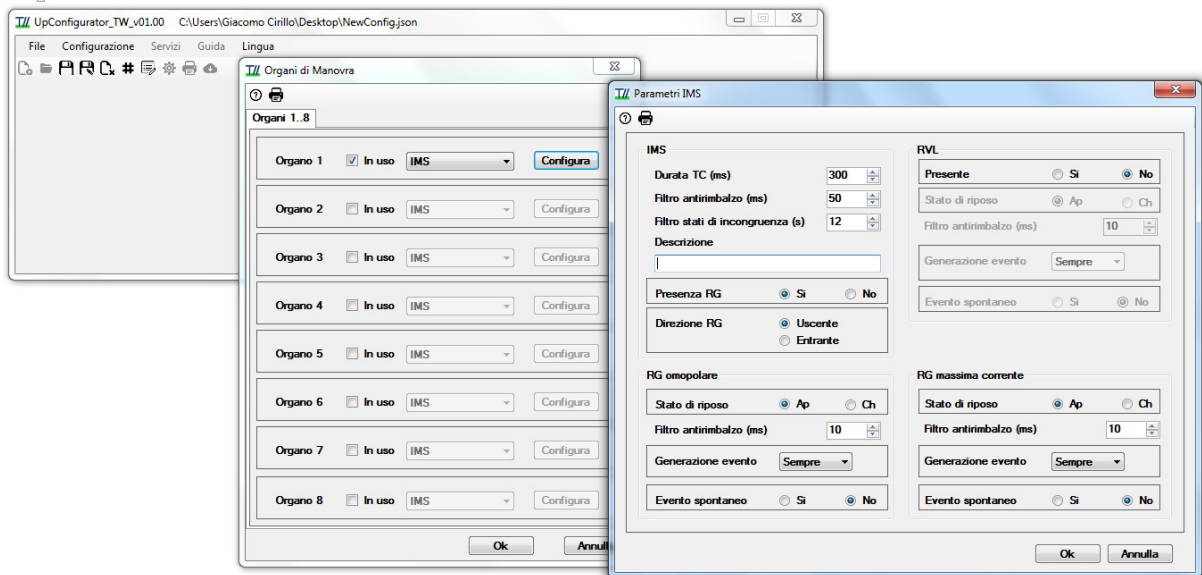
The application allows to define:

- The general parameters of operation of the device
- Communication parameters
- The characteristics of the OdMs connected to the UP
- Remote Signals, Remote Measures and the Digital outputs.

Furthermore, it is a useful diagnostic and verification tool, as it allows:

- Monitoring the status of the inputs and outputs
- Monitoring, with the possibility of saving on file, the states of the automatisms, their transitions and the corresponding values assumed by the physical and logical inputs.
- Sending commands to the instantiated OdMs.

It is also possible to analyze the recordings at a later time.



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