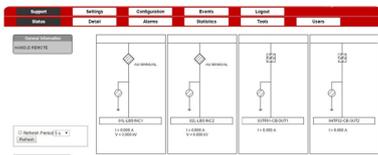


INGEPAC

DA AU

Smart Distribution Automation System



Software

All the equipment in the INGEpac™ family can be accessed using powerful software tools developed by Ingeteam and which run on Windows®.

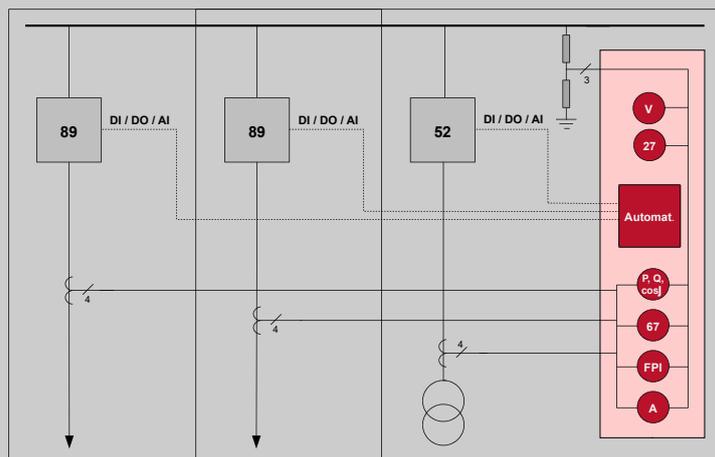
The application software is specifically designed for simple and user-friendly access to the equipment.

INGESYS EFS

INGEPAC™ DA AU covers a wide range of applications making it possible to use **one single device** to fulfil every **automation, protection, measurement and remote control** requirements, for **RMUs and overhead applications (LBS)** in the secondary grid.

INGEPAC™ DA AU is a **modular solution** being possible to customize each device for different size substations, from one to several switchgear sets, by defining the number of **binary inputs and outputs**, analogue inputs from **transducers**, and current and voltage from **instrument transformers or sensors**.

INGEPAC™ DA AU lets choose **different mechanical solutions** (compact, front panel, DIN rail) and **front interfaces** (pushbuttons, LED, etc.), offering the optimal configuration for each requirement.



Automation, monitoring and protection functions
 Real time monitoring of the substation's signals
 Local and remote control for all the feeders of the substation
 Voltage detection
 Directional fault passage indication
 Load transfer
 Automatic fault isolation
 Overcurrent protection

Breaker Monitoring
 Opening, closure, kI2 counters

Alarm for excessive number of trips
 Command failure
 Opening and closure command (pulsed and latched)

Data Acquisition Functions
 Event log
 Oscillography
 By feeder: phase and neutral current, voltage, active, reactive and apparent power, power factor, frequency
 Digital inputs and outputs
 Analogue inputs from transducer

Communications
 2 Ethernet ports RJ45 or LC FO and 1 serial RS232/RS485, GFO or PFO
 Ethernet server protocols: IEC60870-5-104, IEC61850, DNP3
 Slave serial protocols: IEC60870-5-101, IEC60870-5-103, PROCOMÉ
 Master serial protocol: Modbus RTU (for some models)

Synchronisation
 SNTP, Irig-B

Local Interface
 Keys for Local/Remote, Automatic/Manual and switch operation
 LED indications

Web Server
 Monitoring, setting and configuration and firmware update

Other functions
 User logic
 Power supply monitoring

Electromagnetic and insulation

· Measurements of conducted radio electric disturbances	EN 55022
· Measurements of radiated disturbance field strength	EN 55022
· Electrostatic discharges immunity	IEC 61000-4-2
· Radio frequency electromagnetic fields immunity	IEC 61000-4-3
· Electrical fast transients immunity	IEC 61000-4-4
· Surge immunity	IEC 61000-4-5
· Conducted disturbances induced by radio frequency fields immunity	IEC 61000-4-6
· Power frequency magnetic fields immunity	IEC 61000-4-8
· Pulsed magnetic fields immunity	IEC 61000-4-9
· Damped oscillatory magnetic fields immunity	IEC 61000-4-10
· DC power voltage ripple immunity	IEC 61000-4-17
· Damped oscillatory wave immunity	IEC 61000-4-18
· DC power voltage dips, interruptions and variations immunity	IEC 61000-4-29
· Low frequency signals immunity	IEC 60255-22-7
· Insulation resistance measurements	IEC 60255-5
· Impulse voltage	IEC 60255-5
· Dielectric	IEC 60255-5

Environmental

· Cold	IEC 60068-2-1
· Dry heat	IEC 60068-2-2
· Change of temperature	IEC 60068-2-14
· Damp heat, steady state	IEC 60068-2-78
· Degree of protection IP42D (front)	IEC 60529

Mechanical

· Vibration (sinusoidal)	IEC 60255-21-1
· Shock and bump	IEC 60255-21-2
· Seismic	IEC 60255-21-3
· Vibration (random)	IEC 60068-2-64

Main features

- Control in one single device of several switchgear feeders
- Up to 4 slots for plug-in modules (binary inputs, outputs or analogue inputs)
- Some models include gateway function from Modbus RTU, in order to integrate devices supporting this protocol in the Smart Grid
- Built-in web server for remote access through a commercial browser. This access allows real time monitoring and operation, settings change and log files download
- User logic
- Programmable LEDs
- Voltage measurement from sensors or from conventional measurement transformers
- Serial and Ethernet communication
- Real-time switchgear monitoring, log and statistical metering
- Oscillographic log
- Multiple setting groups allowing to adapt settings to grid conditions changes instantaneously
- SNTP and IRIG-B synchronization
- Power supply monitoring
- Conformal coating for special environments

Options

- Operating voltages 24, 48, 125, 220 Vdc
- Modules
 - CPU with 8 BI + 5 BO
 - 15 BI + 8 BO
 - 24 BI + 16 BO
 - 3 V + 4 I + 1 AI + 13 BI
 - 8 I + 13 BI
 - 8 AI + 15 BI
 - 4 V + 4 I + 13 BI
 - 4 V + 4 I + 4 BI + 4 BO
- Voltage inputs from sensor (resistive or capacitive divider) or instrument transformer
- High Speed output contacts

Applications

- Ring Main Units and compact transformer substations automation
- Overhead distribution automation (LBS, etc.)
- Switchgear control
- RTU for small substations or power plants