

Smart distribution automation system

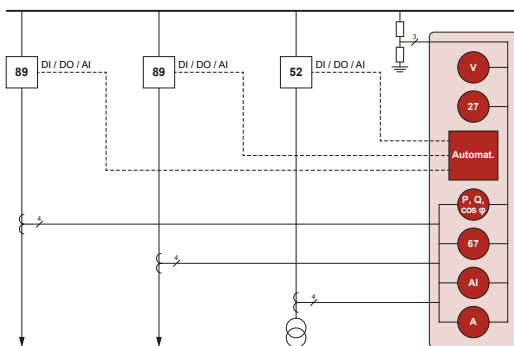
INGEPAC™ DA AU covers a wide range of applications, making it possible to use one single device to fulfil every automation, protection, measurement and remote control requirements, for **feeder automation** or **RMU**.

INGEPAC™ DA AU is a **modular solution** that allows the customization of each device for different size substations, from **one to several switchgear sets**. There are different configurations of: binary inputs and outputs, analogue inputs from transducers, and current and voltage from instrument transformers or sensors.

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

Applications

- Ring Main Units and secondary substations automation
- Switchgear control
- FRTU and LBS controller



Automation, monitoring and protection functions

- Real time monitoring of the substation signals
- Local and remote control for all the feeders of the substation
- Voltage detection
- Directional fault passage indication (FI)
- Load transfer
- Automatic fault isolation (FDIR)
- Overcurrent protection
- Inrush supervision
- Breaker monitoring
- Opening, closure, kl2 counters
- Alarm for excessive number of trips
- Command failure
- Opening and closure command (pulsed and latched)

Data acquisition

- SOE (4000) and 20 fault reports
- Oscillography: analog channels and 100 digital channels
- Measurements: I, V, P, U, Q, f, cos phi

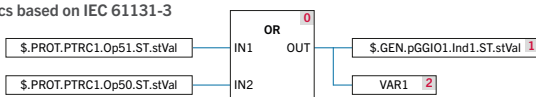
Synchronization

- SNTP
- IRIG-B

Communications

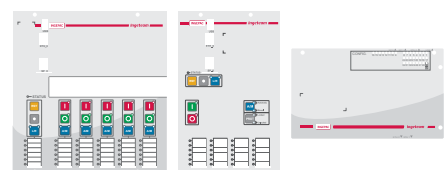
- Protocols: IEC 61850, IEC 60870-5-104, DNP3 (secure authentication)
- Web services: HTTP/HTTPS, FTP/sFTP

Logics based on IEC 61131-3



Local HMI

- Physical keys:
 - Local/Remote
 - Automatic/Manual
 - Switch operation
- Programmable LEDs



**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
Random vibrations	IEC 60068-2-64

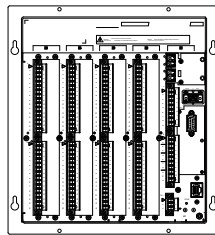
**MAIN FEATURES**

- 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: real time monitoring and operation, settings change and log files download
- Voltage measurement from LPIT or from conventional measurement transformers
- Real-time switchgear monitoring, log and statistical metering
- Multiple setting groups to instantaneously adapt settings to changes in grid conditions

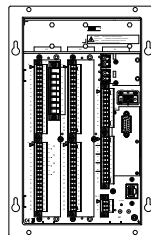
HARDWARE OPTIONS**Mounting options**

Flush or backplate surface mounting:

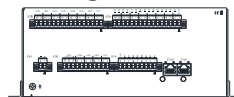
- $\frac{2}{3}$ 19" rack (up to 4 I/O slots)



- $\frac{1}{3}$ 19" rack (up to 2 I/O slots)



- Compact housing (1 I/O slot)

**Boards options**

- 15 DI + 8 DO
- 24 DI + 16 DO
- 15 DI + 16 DO
- 8 AI from converter (mA or V)
- 4 V + 4 I + 13 DO

Optional

- Voltage inputs from VT or LPIT
- High speed digital outputs

Communication ports

- 1 serial + 2 Ethernet

Power supply

- Available voltages:
24/48 Vdc or 125/220 Vdc

SOFTWARE

All the devices in the INGEPACTM product range can be accessed using powerful software tools developed by Ingeteam which run on Windows®

Application specifically designed for simple and user-friendly access to the equipment

INGESYS eFS