



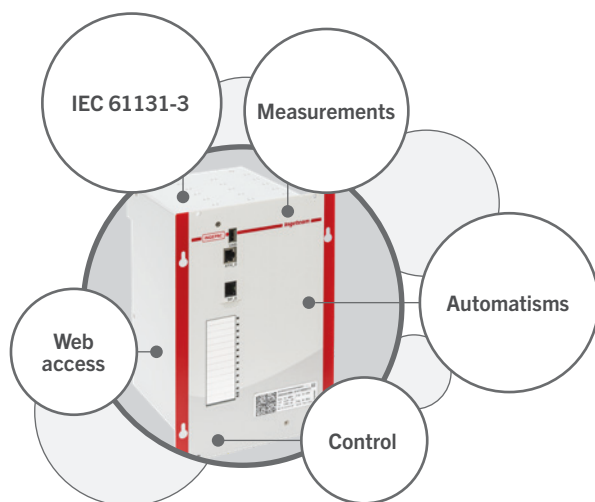
Digital control unit

INGEPAC™ DA PTC is an intelligent electronic device designed as a digital interface for monitoring and automating an electrical bay. This family of devices has been type tested for **harsh environment** being a suitable solution for its installation close to the primary equipment – either in the substation's switchyard in **AIS substations** or in **GIS control panel** – replacing hundredths of copper cables by fibre optic links.

Its **high digital input / digital output density** and **IEC 61131-3** programmable logic capabilities make it suitable as a **bay controller** (commands, trips, interlocks, metering, etc.) in transmission and distribution levels and in different substation topologies (breaker and a half, double busbar, etc.).

Applications

- Bay control and automation
- Primary switchgear digital interface for digital substations
- Remote Terminal Unit (RTU) for small facilities
- Programmable Logic Controller (PLC) for substation process automation



Functions

Capture of wired digital signals
Remote controller
Capture of measurements
Acquisition of analog signals from converter (mA or V)
SCADA communication

Data acquisition

SOE (2000)
Oscillography: 8 analog and 100 digital channels, for models with measurement board
Measurements: I, V, P, U, Q, f, etc.

Communications

Protocols: IEC 61850, IEC 60870-5-101/103/104, DNP3, Modbus
Redundancy: PRP, HSR, D-link failure, switch mode
Web services: HTTP/HTTPS, FTP/sFTP

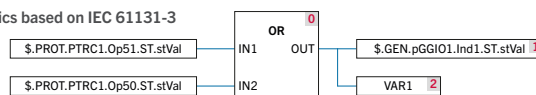
Synchronization

IEEE 1588 v2
SNTP
IRIG-B

Local HMI

3,5" display (optional)
Configurable graphical displays
I/O/L/R pushbuttons and programmable keyboard
Configurable LEDs

Logics based on IEC 61131-3



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

High precision in direct measurements (class 0.2 in currents and voltages)

Wide range current inputs allowing the same device to be connected to 1 A and 5 A CT secondary

Through the front USB you can access the device to retrieve reports and equipment CID, load an external CID, load the firewall configuration, or update the equipment firmware

Synchronization from communications protocols, SNTP, IEEE 1588 v2 (PTP), demodulated IRIG-B input or PPS input, pacFactory or display

Web server for monitoring and setting without needing additional software

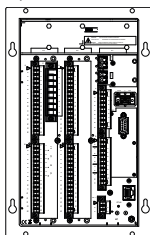
Cybersecurity features: sFTP, HTTPs, firewall, audit log, password accessing, RBAC, LDAP, session management, etc.

HARDWARE OPTIONS

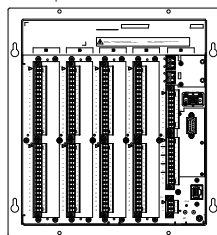
Mounting options

Flush or backplate surface mounting:

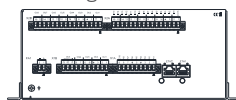
- ½ 19" rack (up to 2 I/O slots)



- ¾ 19" rack (up to 4 I/O slots)



- Compact housing (1 I/O slot)



Boards options

- 15 DI + 8 DO
- 24 DI + 16 DO
- 15 DI + 16 DO
- 4 DI + 5 DO
- 11 DI
- 13 DI
- 8 AI from converter (mA or V)
- 4 V + 4 I + 4 DI + 5 DO
- 4 V + 4 I + 4 DI + 13 DO

Optional

- High speed digital outputs

Communication ports

- 1 serial + 2 Ethernet

Power supply

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

Optional IP55 front protection

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

