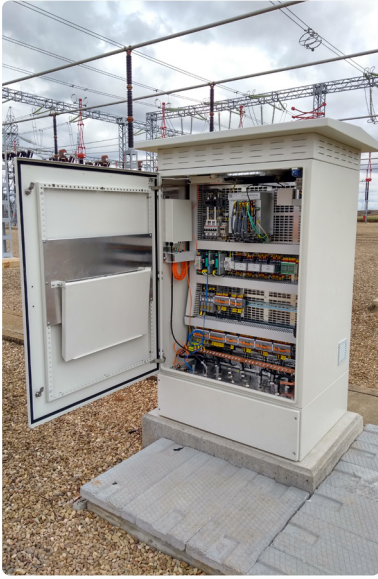


INGEPAC

DA PTC

IEC 61850 Digital Interface for primary switchgear control



Software

All INGEpac™ range devices can be set and monitored with powerful software tools by Ingeteam running in a Windows® environment.

This application software has been specifically designed for simple and user-friendly access to the devices.

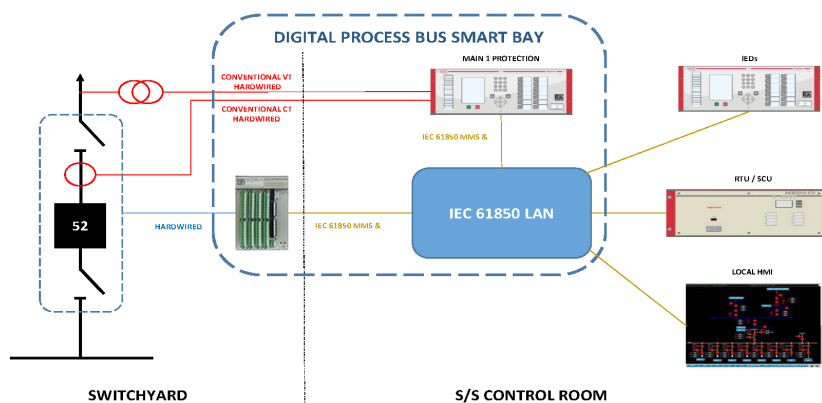
INGESYS EFS



INGEPAC™ DA PTC is an Intelligent Electronic Device designed as a **digital interface** for the Bay Control and **Integration of Primary Switchgear** in Substation Automation Systems. 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 hundreds of copper cables by fibre optic links**. Additional benefits include **minimizing the Control Room's footprint**, improving installation and commissioning time, **electric shock risk reduction** in the Control Room due to the replacement of live DI/DO circuits by FO communication links and maintenance simplification throughout the substation automation system's life cycle.

INGEPAC™ DA range of IED is **IEC 61850 Ed.2 Level A** certified – allowing the enabling of **IEC 61850 Digital Process Bus** in Digital Substations – and supports additional protocols such as **IEC 60870-5-103** (Serial), **IEC 60870-5-101** (Serial), **IEC 60870-5-104** (TCP-IP) and **DNP 3.0** (Serial / TCP-IP). 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.).

All INGEpac™ IED are configured using the user friendly **PAC Factory software** tool which is supplied with the devices.



Functions

- Capture of wired digital signals and switchgear control.
- Communication with the substation level.
- Programmable user logic
- Data acquisition functions**
- Chronological recording of events and faults

Communications

- RJ45 front port
- Rear ports: one serial RS232/485 and two Ethernet ports
- Protocols: IEC61850 Ed.2, DNP3.0
- Web server and FTP
- Synchronisation**
- IEEE 1588v2 (PTPv2), SNTP communication, IRIG-B

Electromagnetic and insulation tests

· Measurements of conducted radioelectric disturbances	EN 55022
· Measurements of radiated disturbance field strength	EN 55022
· Insulation resistance measurement	IEC 60255-5
· Dielectric withstand	IEC 60255-5
· Impulse voltage	IEC 60255-5
· Electrostatic discharge immunity	IEC 61000-4-2
· Radiated radiofrequency electromagnetic field immunity	EN 61000-4-3
· Electrical fast transient/burst immunity	IEC 61000-4-4
· Surge immunity	IEC 61000-4-5
· Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6
· Power frequency magnetic field immunity test	IEC 61000-4-8
· Impulse magnetic field immunity	IEC 61000-4-9
· Damped oscillatory magnetic field immunity	IEC 61000-4-10
· 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
· Power frequency immunity	IEC 60255-22-7
· Withstand to radiated electromagnetic interference from transceivers	IEEE C37.90.2

Climatic

· Low temperature test - Cold	IEC 60068-2-1
· Dry heat test	IEC 60068-2-2
· Thermal shock	IEC 60068-2-14
· Moist heat continuous	IEC 60068-2-78

Mechanical

· Sinusoidal vibration	IEC 60255-21-1 / EN 60068-2-6
· Impacts and shocks	IEC 60255-21-2 / EN 60068-2-27
· Seismic	IEC 60255-21-3
· Random vibration	IEC 60068-2-64

Main features

- Type tested for harsh environment allowing its installation in the switchyard, close to the primary switchgear
- IEC 61131-3 based programmable control logics to enable Bay Control Unit functions
- IEC 61850 Ed. 2 Level A certified, including MMS and GOOSE (IEC61850-8-1)
- IEC 61850 Ed. 2 Test Mode simplifies commissioning and maintenance throughout the IED life cycle
- IEC 60870-5-103 (Serial), IEC 60870-5-101 (Serial), IEC 60870-5-104 (TCP-IP) and DNP 3.0 (Serial / TCP-IP communication protocols)
- Embedded Web Server for IED management
- Fully programmable Digital Input and Digital Outputs
- Sequence of Events (SOE) recording
- Self-check algorithms plus watchdog
- 2 x LAN and 1 x RS232/485 serial port

Options

- Two types of housing (2 or 4 slots for input and output cards)
- Available power supplies: 24/48 Vdc or 125/220 Vdc
- Maximum configurations of 104 digital inputs and 32 digital outputs
- PRP/HSR and Link Failover redundancy

Applications

- IEC 61850 Digital Process Bus enabling in Digital substations
- Primary Switchgear Digital Interface to Substation Automation Systems
- Bay Control
- Advanced Remote Input / Output Module
- Remote Terminal Unit for small facilities
- Copper cable to Fiber Optics converter
- Programmable Logic Controller for Substation Process Automation