

INGEPAC

RIO

Remote inputs and outputs Device



Applications

· Remote signal capturing in control and protection systems in compliance with IEC 61850 standard



INGEPAC™ RIO is a digital input / output module which can be installed as a **control interface** to primary equipment in the switchyard and in MV switchgear cubicles. INGEpac™ RIO allows to the circuit breakers, disconnectors, transformers, etc. to interact remotely with the digital devices at substation automation systems.

Signals are sent and received via **GOOSE messages** using **Ethernet** communication, in compliance with standard **IEC 61850**.

INGEPAC™ RIO modules **reduce cabling**, enabling the system to capture information and operate remotely whilst **minimising costs** and **increasing system flexibility**.

Power Grid Automation

INGEPAC™ RIO has the following features:

- Binary inputs for signalling
- Binary outputs with potential-free contacts
- Reception of commands from the Substation Automation System IED, in order to operate the primary switchgear, using IEC 61850 standard GOOSE messaging
- Transmission of captured signals from its binary inputs to the Substation Automation System IED, using IEC 61850 standard GOOSE messaging
- Transmission of captured signals from its binary inputs to the Substation Automation System IED, using IEC 61850 standard GOOSE messaging
- Transmission of device health signals to the Substation Automation System IED, using IEC 61850 standard GOOSE messaging
- Activation of the digital outputs performed by an OR or an AND function of the signals received
- Mirror mode: digital transmission of inputs and outputs between a couple of RIO

Connection between IED and RIO modules is IEC 61850-compliant, being suitable for being connected to Ingeteam systems as well as with other vendors systems compliant with the standard.

INGEPAC™ RIO has been designed to meet the standards required for electrical environments; therefore, it can be integrated into any type of electrical installation, being it new or existing. Hence, no changes are needed in existing assets in terms of switchgear, electrical control panels or primary equipment.

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Ingeteam

Electromagnetic and insulation

· Dielectric withstand	IEC 60255-27
· Insulation resistance measurement	IEC 60255-27
· Impulse voltage	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
· 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
· Measurements of radiated and conducted radiofrequency disturbances	EN 55022
· Power frequency immunity test	IEC 60255-22-7

Climatic

· Cold	IEC 60068-2-1
· Dry heat	IEC 60068-2-2
· Change of temperature	IEC 60068-2-14
· Damp heat steady	IEC 60068-2-78

Mechanical

· Vibrations	IEC 60255-21-1
· Shock and bump	IEC 60255-21-2
· Seismic	IEC 60255-21-3
· Random vibrations	IEC 60068-2-64

Basic features

- DIN rail mounting system
- 12 binary inputs
- 4 binary outputs + 1 alarm output
- Two RJ45 or Fibre Optic Ethernet ports (singlemode or multimode)
- Microswitches on the front to set the RIO's communications address
- GOOSE subscription with up to 8 IED
- Status information LED

Protocols

- IEC 61850-8-1 GOOSE

Options

- Power supply: 48 Vdc, 125 Vdc, 220 Vdc
- Communication ports:
 - RJ45
 - FO multimode
 - FO singlemode (60 km)
 - Fo singlemode (60-120 km)

