

## Application

The IPTP parallelism control and position indicator is intended to manage parallelism between transformers with on-load tap-changer that have the same amount of taps (up to 51) and equal impedance, it manages parallelism through the Master-follower method in three-phase and single-phase devices with up to 32 networked equipment where only 1 (one) is listed as MASTER and this supervises all others through an intelligent communication protocol that is capable of detecting and indicating which networked equipment has failures and even making autonomous decisions, as well how to provide information to automatically generate a self-diagnosis of the entire system, in order to expedite a possible intervention by the operator or maintenance.

## Main Features



Switch supervision and operation with TAP measurement and indication



Parallelism management and control for up to 32 three-phase transformers or 9 single-phase banks



Potentiometric crown signal input (mA or resistive)



Analog output for measured TAP



Fault indication contact (Watchdog)



RS485 digital output with MODBUS-RTU and DNP 3 protocols



Extended operating temperature -40 to +85 °C (-40 to +185 °F)



8 relays for signaling and command



Password Protected Setup Menu



USB frontal para configuração através do software USEEASY

## Aluminum casing

The aluminum casing has high mechanical strength and creates a Faraday cage that increases the immunity of electronic circuits in cases of noise induction and electrical discharges. The housing also acts as a heat sink, extending the life of the IED.

## Display

4-digit display 13.8 mm high with high brightness LED, allowing reading in any light condition.

## Simple Setup

Easy configuration via the keyboard on the equipment or via a laptop using the USEEASY software, which issues graphs and reports.

## Parallelism

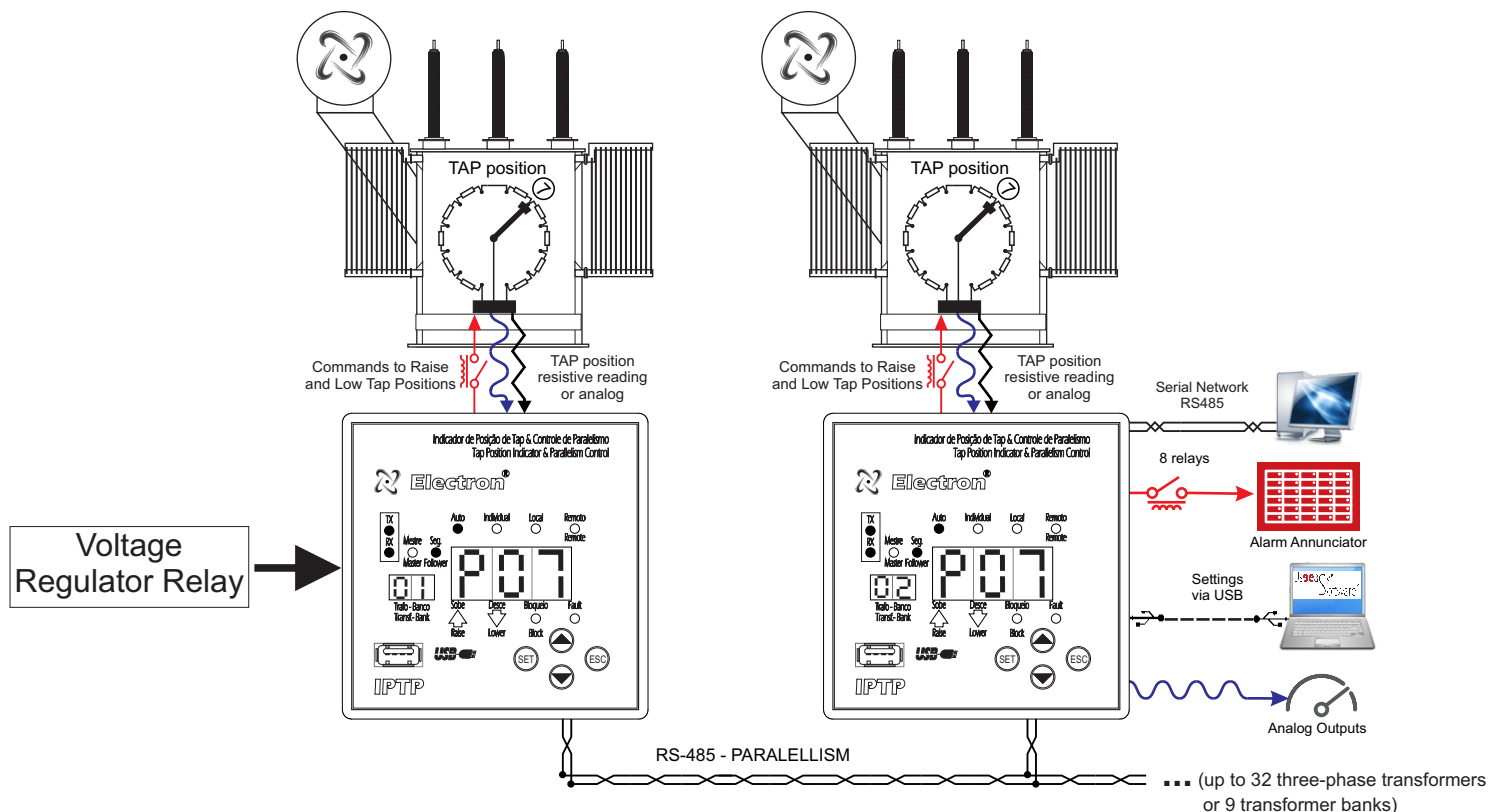
It manages the parallelism of up to 32 three-phase transformers or 9 single-phase banks through a master-follower architecture.

## Input Signal

Receives the resistive or 4 to 20 mA signal from the tap-changer potentiometric crown.

## Quality Assurance

Your hardware is designed to withstand severe working conditions. The DVR can be installed directly in transformer or reactor panels, in substations, offshore platforms or chemical industries. Meets all levels of supportability and reliability according to IEC, DIN, IEEE and ABNT standards.



## Technical Data

Operating Voltage	48 - 265 Vdc/Vac 50/60 Hz
Consumption	< 15W
Operating Temperature	-40 to +85 °C (-4 to +185 °F)
Storage Temperature	-50 to +60 °C (-58 to +140 °F)
Input for TAP Measurement	Resistive Crown from 0 to 5000 ohms
Measurement Range	0 to 20 mA or 4 to 20 mA transducer
Entry to Dry Contacts	-50 to 50 TAPs - Programmable (50 pos.)
Input for TAP Position Measurement	3 inputs for Dry Contact (Potential Free)
Analog Output [mA] and Maximum Load	1 ~ 51 Positions – Resistor Contact Series
Analog Output Maximum Error	(max 5,000 ohms) or Analog (4 to 20 mA)
Outbound Contacts	0.1 (8000 ohms) / 0.5 (1600 ohms) / 0.10 (800 ohms)
Maximum Switching Power	0..20 (400 ohms) / 4..20 (400 ohms)
Maximum Switching Voltage	0.25% of the end of the scale
Maximum Conduction Current	8 – Potential Free
Serial Network Communication Port	70 W / 250 VA
Communication Protocol for Serial Network	250 Vac / Vdc
Auto Baud Rate	6 A
Housing according to DIN IEC 61554	RS485 (ANSI/TIA/EIA-485-A)
Fixation	Modbus RTU and DNP 3 Level 1
Degree of Protection (NBR IEC 60529)	2400 to 57,600 bps

## Attended Type Tests

- Applied voltage (IEC 60255-5): 2kV / 60 Hz / 1 min (against ground);
- Voltage pulse (IEC 60255-5): 1.2/50 ms / 5 kV / 3 neg and 3 pos / 5 s Range;
- Electrostatic discharges (IEC 60255-22-2): Air Mode = 8 kV / Contact Mode = 6 kV;
- Immunity to radiated electromagnetic disturbance (IEC 61000-4-3): 80 to 1000 MHz / 10 V/m;
- Immunity to fast electrical transients (IEC 60255-22-4): Alim. / Inputs / Outputs = 4 kV / Common 2 kV;
- Surge Immunity (IEC 60255-22-5): Phase/Neutral 1 kV, 5 per polar (±) - phase-ground/neutral-ground 2 kV, 5 per polar (±);
- Immunity to conducted electromagnetic disturbances (IEC 61000-4-6): 0.15 to 80 MHz / 10 V/m;
- Climatic test (IEC 60068-21-14): -40 °C @ + 85 °C / 72 hours;
- Vibration resistance (IEC 60255-21-1): 3 axes / 10 - 150 Hz / 2G / 160 min/axis;
- Vibration response (IEC 60255-21-1): 3axis / 0.075mm @ 10 - 58 Hz / 1G @ 58 - 150 Hz / 8 min / axis