
Electron

IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

History

Electron do Brasil Tecnologia Ltda was founded on September 2005.

Electron birthplace is Jundiaí City, São Paulo State Region (Brazil), Where it was stabilished and made great strategic alliances with customers and suppliers.

In 2009, it moved to Itupeva city, where has its installations amplifyed in order to generate new alliances and Customers portfolio.

Currently, Electron develops measurement and protection instruments of control IED (Intelligent Eletronic Device) type intended for Power Transformers, Reactors, Power Generators, Motors and Industrial Machines. With more than 17 years of market activity, we work with exportations to latin and north America.

Based on the continuous evolution of the electrical and electronic sectors, Electron develops its products with innovative and easy features to attend new demands of its Customers various applications.

Electron uses the most modern concepts of technology that is currently available in the world to develop its equipments.

This is possible because we count with a high professional quality of engineers with more than 30 years of experience on Electrical, Electronic, Mechanical, Chemical and IT Engineering fields. We are associated with R&D (Research & Development) and we have great relationship with its contributors in the world market.

In this way, our products and services with the best quality and high technology are designed to attend to rigorous requirements of new Customers.



Electron HQ in Itupeva, São Paulo - Brasil

CERTIFIED ISO 9001 QUALITY MANAGEMENT COMPANY

Electron

EXPERTISE

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At Electron do Brasil, we produce and develop IEDs for monitoring and control of power systems. Over 95% of the manufacturing process is made at our company HQ.

Our team counts on highly experienced and capable professionals, constantly researching, directing, reviewing, and applying methods to continuous improvement to ensure customer experience quality with our application solutions.

All of our equipments and methods are developed, rehearsed and tested according to national and international main standards specifications, such as IEC, IEEE, ANT, ANSI, and ISO.



SMT Electronic Manufacturing



PTH Electronic Manufacturing



Mechanical Manufacturing



IEDs Quality Control Laboratory



Hardware and Firmware development Engineering



Field training, technical support, and comissioning

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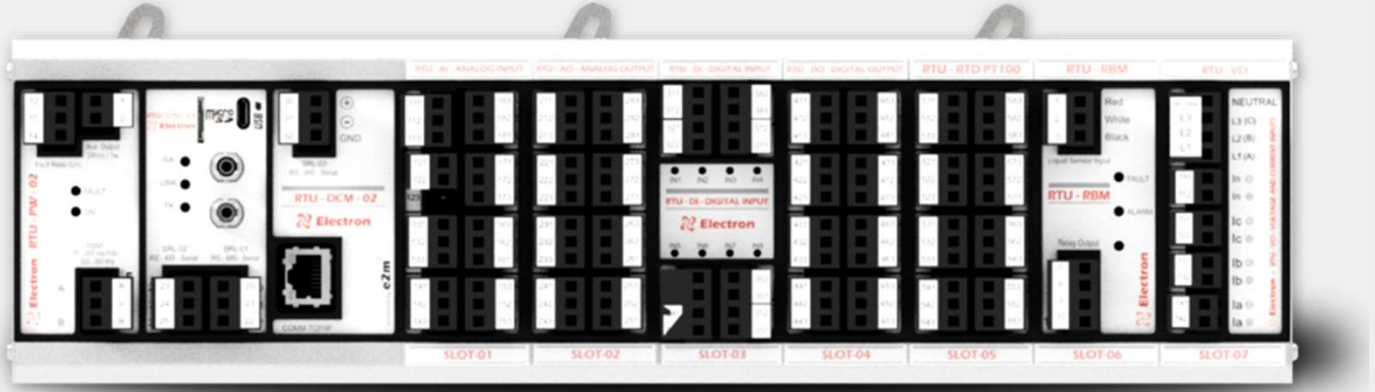
IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

Over 17 years of activity **ELECTRON** has in its database more than **1,800 CUSTOMERS** in Brazil, Latin America and North America.

The world largest dealerships and manufacturers **TRUST** and **APPLY** **ELECTRON** technology to protect and monitor their Power Transformers and Reactors.

Electron





Electron - IOT

Electron-IOT developed an IOT monitoring platform that works as a concierge for the transformer, in addition to supplying the transformer manufacturer on the conditions to which the transformer is being subjected during the warranty period, it also keeps the user updated on health transformer, alarms and best practices to keep the transformer healthy.

IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

Electron – Intelligent Electronic Devices

Electron develops and manufactures Intelligent Electronic Devices (IEDs) for monitoring, control, supervision and protection of power transformers, reactors, dry type transformers, protection panels and converters for data transmission, the equipment developed uses the most modern and current technologies existing in the world and we have a modern industrial park with automatic machines and pick and place for assembling and manufacturing the devices,

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IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

CHESF MINUEIRA











CERTIFIED ISO 9001 QUALITY MANAGEMENT COMPANY

Temperature Digital monitoring of windings and Oil for 230 KV Power Transformers - Chesf Utility - Pernambuco – Brazil ~ in 2006

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IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

FURNAS (ITAIPU)











Oil Level Digital Monitoring in all the Power Transformers of Furnas Substation (Itaipu – Brasil) ~ in 2009

CERTIFIED ISO 9001 QUALITY MANAGEMENT COMPANY

Electron

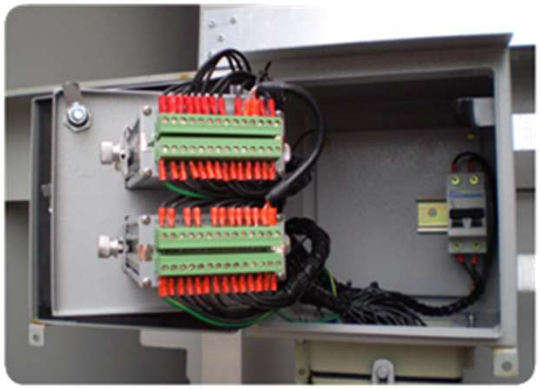
IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

CHESF FORTALEZA











CERTIFIED ISO 9001 QUALITY MANAGEMENT COMPANY

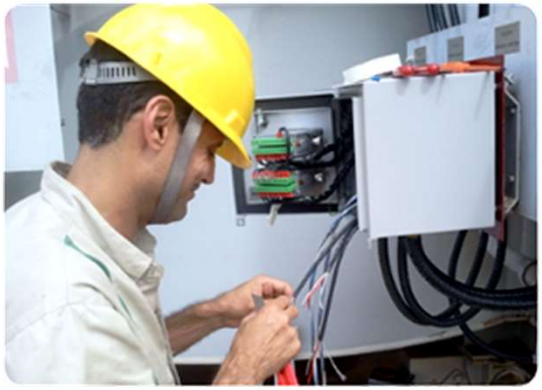
Temperature Digital monitoring of windings and Oil for 500 KV Power Transformers - Chesf utility – Ceará – Brazil ~ in 2010

Electron

IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

CEMIG



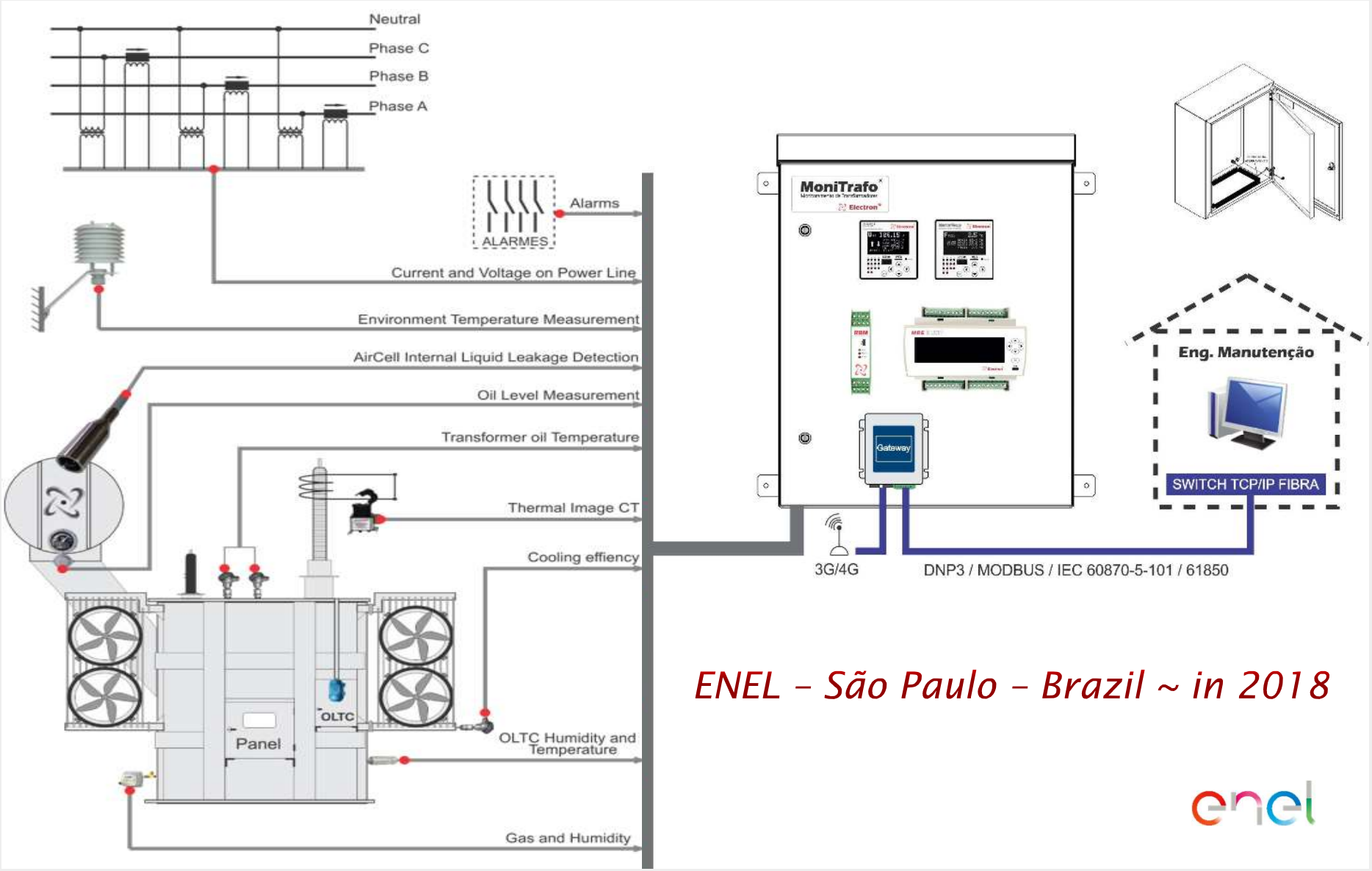

CERTIFIED ISO 9001 QUALITY MANAGEMENT COMPANY

Temperature Digital monitoring of Windings and Oil for 345 KV Power Transformers in CEMIG – Minas Gerais – Brazil ~ in 2012

REFERENCES ENEL PROJECT

IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

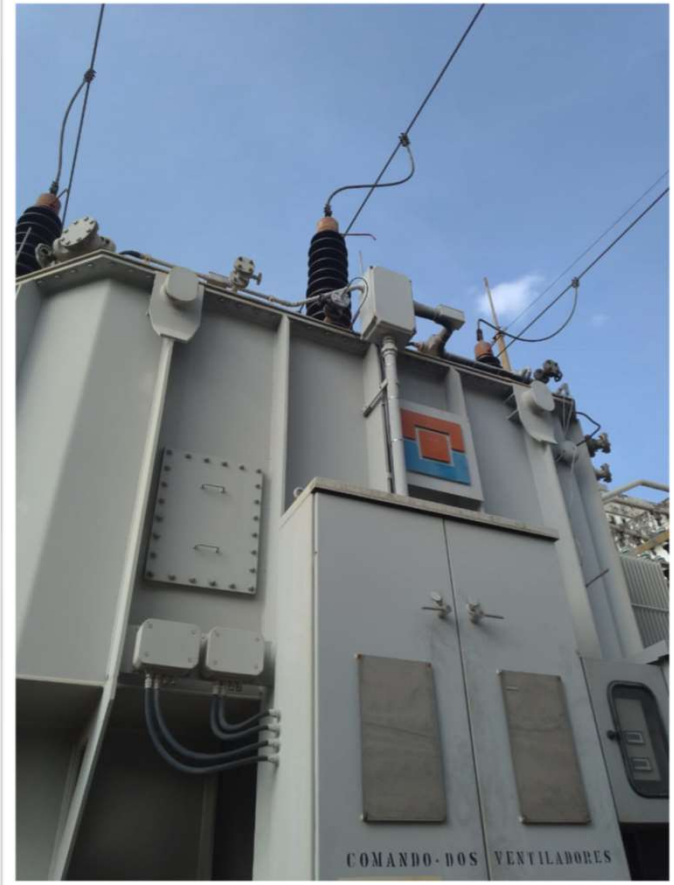
MONITRAFO



ENEL – São Paulo – Brazil ~ in 2018

IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

MoniTrafo Installed in DAUT Utility – ELETROPAULO Autonomists



Power Transformer TUSA 138/88/13.8 Kv-20 Mva







Gases and Moisture Monitor



MONITRAFO Installation

ENEL – São Paulo – Brazil ~ in 2018

IEDs and Sensors installed +100.000 SATISFIED CUSTOMERS

MoniTrafo Installed DVFO Substation – ELETROPAULO Vila Formosa:



Power Transformer TUSA 138/88/13.8 Kv-20Mva



MONITRAFO Installation



Gases and Moisture Monitor



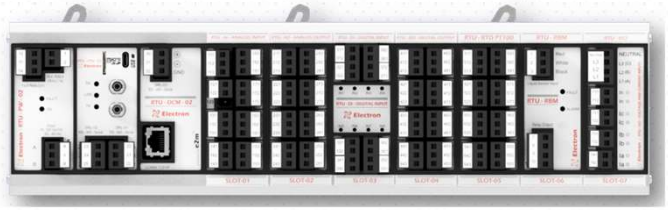
Temperature Monitor and Voltage Regulator Installation

ENEL – São Paulo – Brazil ~ in 2018

IEDs Solutions for Power Transformers and Power Reactors













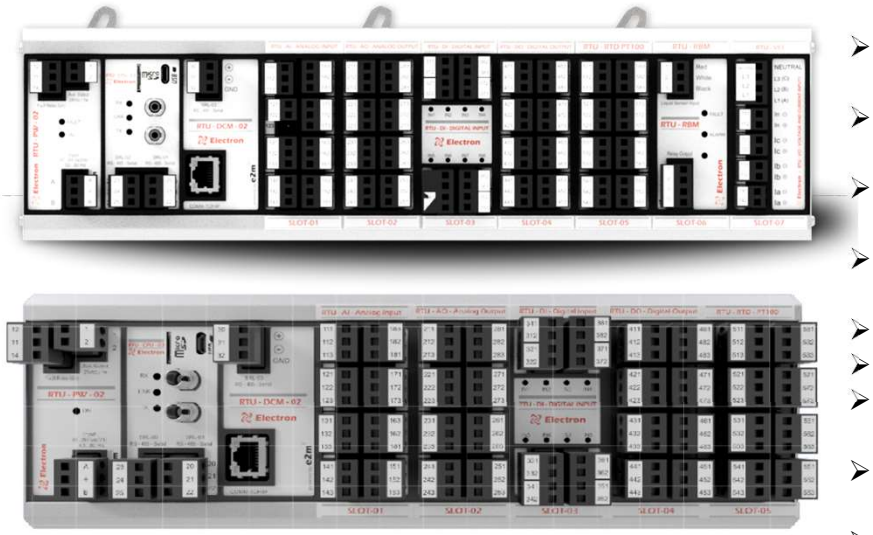








REMOTE TERMINAL UNIT – RTU

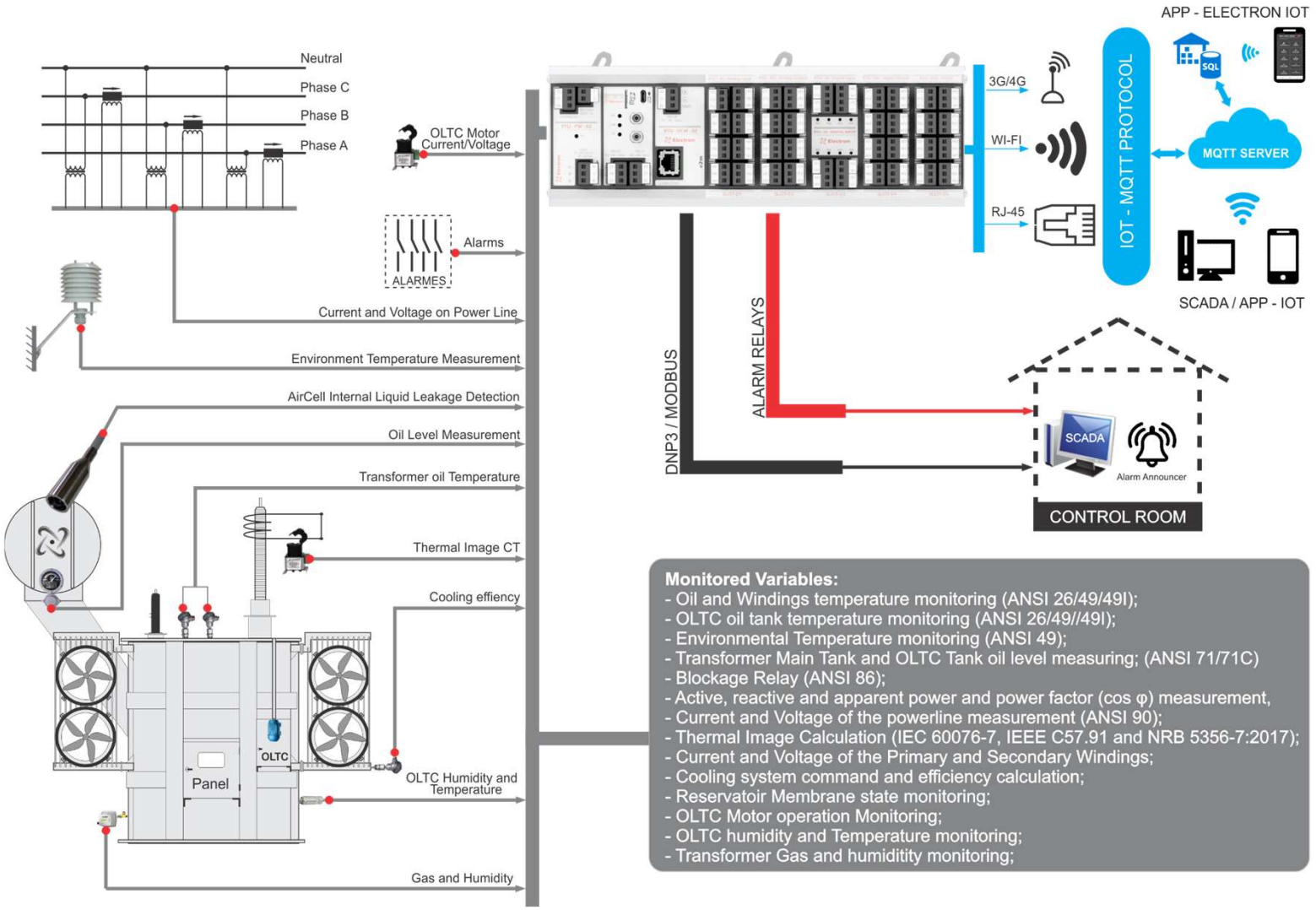


MAIN FEATURES

- Up to 64 modules, each Module with 8 Isolated configurable Voltage and Current inputs with range of 0…20 Vdc and 0…20 mA;
- Up to 64 Modules, each Module with 8 Isolated Digital inputs with range of 24…300 Vdc/Vac;
- Up to 64 Modules, each Module with 8 SPDT (NOC) Relay Isolated digital Outputs (6 A);
- Up to 64 Modules , each Module with 8 Isolated Analog configurable Outputs with range of 0…20 mA;
- Up to 64 Modules, each Module with 8 PNP and NPN inputs of 0…24 Vdc/5 mA supplied by each channel;
- Up to 64 Modules, each Module with 8 Resistive Sensors RTD PT-100 inputs;
- AirCell internal liquid leakage detection Module;
- Up to 64 Modules, each Module with 4 Digital inputs with range of 24…300 Vdc/Vac and 4 RTD PT-100 inputs;
- Up to 64 Modules, each Module with 2 Digital inputs with range of 24…300 Vdc/Vac , 2 RTD PT-100 inputs and ;
- Up to 64 Modules, each Module with 4 configurable Analog inputs with range of 0…20 mA, 2 RTD PT-100 inputs and 2 level measuring inputs;

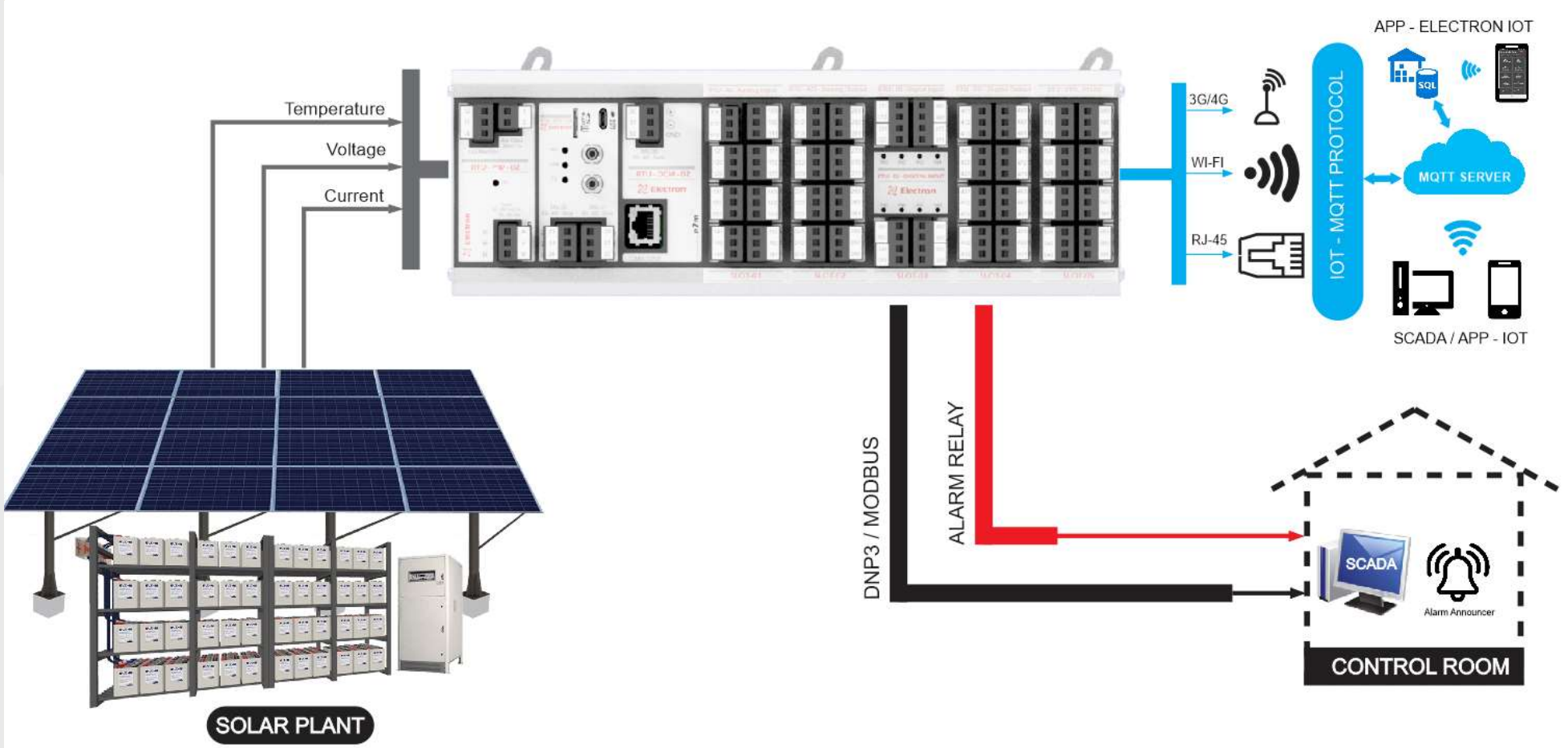
And much more…

REMOTE TERMINAL UNIT – RTU

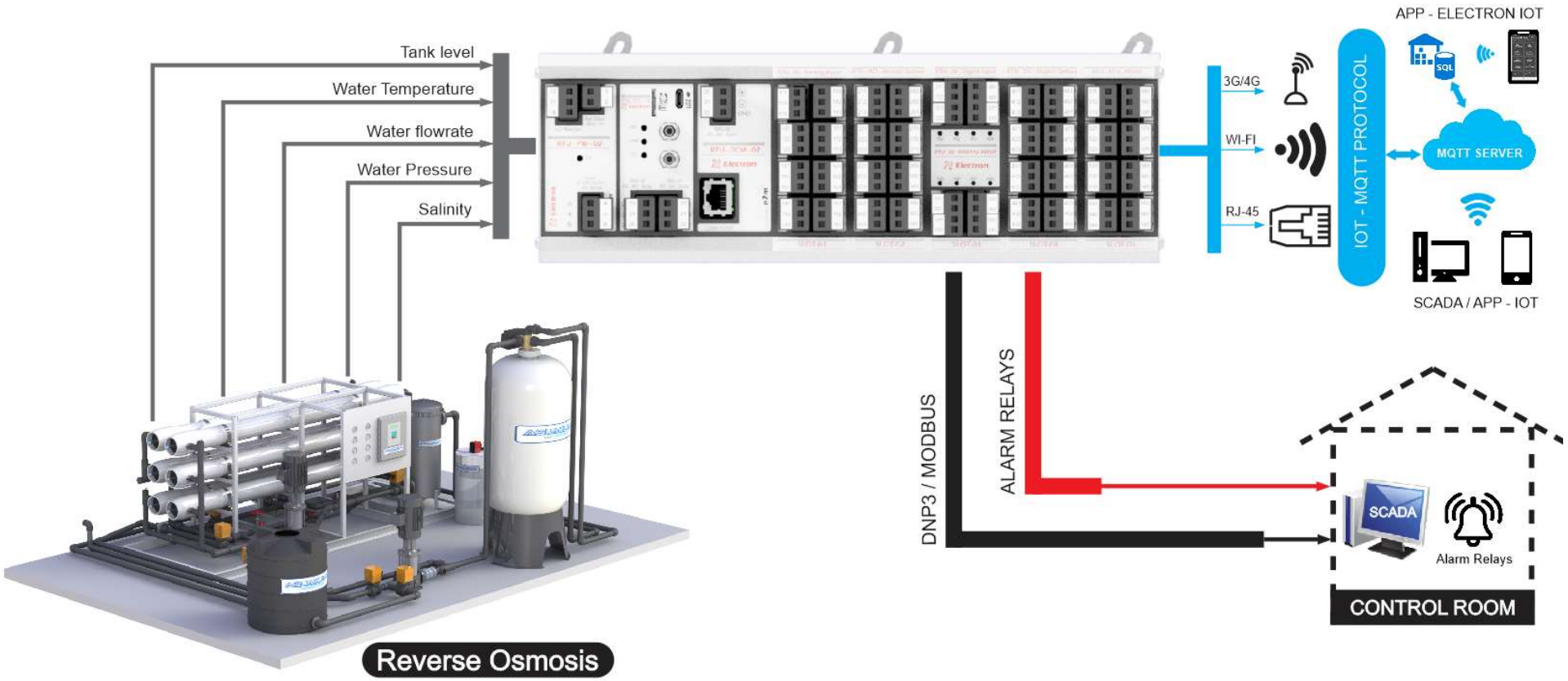


Monitored Variables:
- Oil and Windings temperature monitoring (ANSI 26/49/49I);
- OLTC oil tank temperature monitoring (ANSI 26/49//49I);
- Environmental Temperature monitoring (ANSI 49);
- Transformer Main Tank and OLTC Tank oil level measuring; (ANSI 71/71C)
- Blockage Relay (ANSI 86);
- Active, reactive and apparent power and power factor (cos φ) measurement,
- Current and Voltage of the powerline measurement (ANSI 90);
- Thermal Image Calculation (IEC 60076-7, IEEE C57.91 and NRB 5356-7:2017);
- Current and Voltage of the Primary and Secondary Windings;
- Cooling system command and efficiency calculation;
- Reservatoir Membrane state monitoring;
- OLTC Motor operation Monitoring;
- OLTC humidity and Temperature monitoring;
- Transformer Gas and humiditity monitoring;

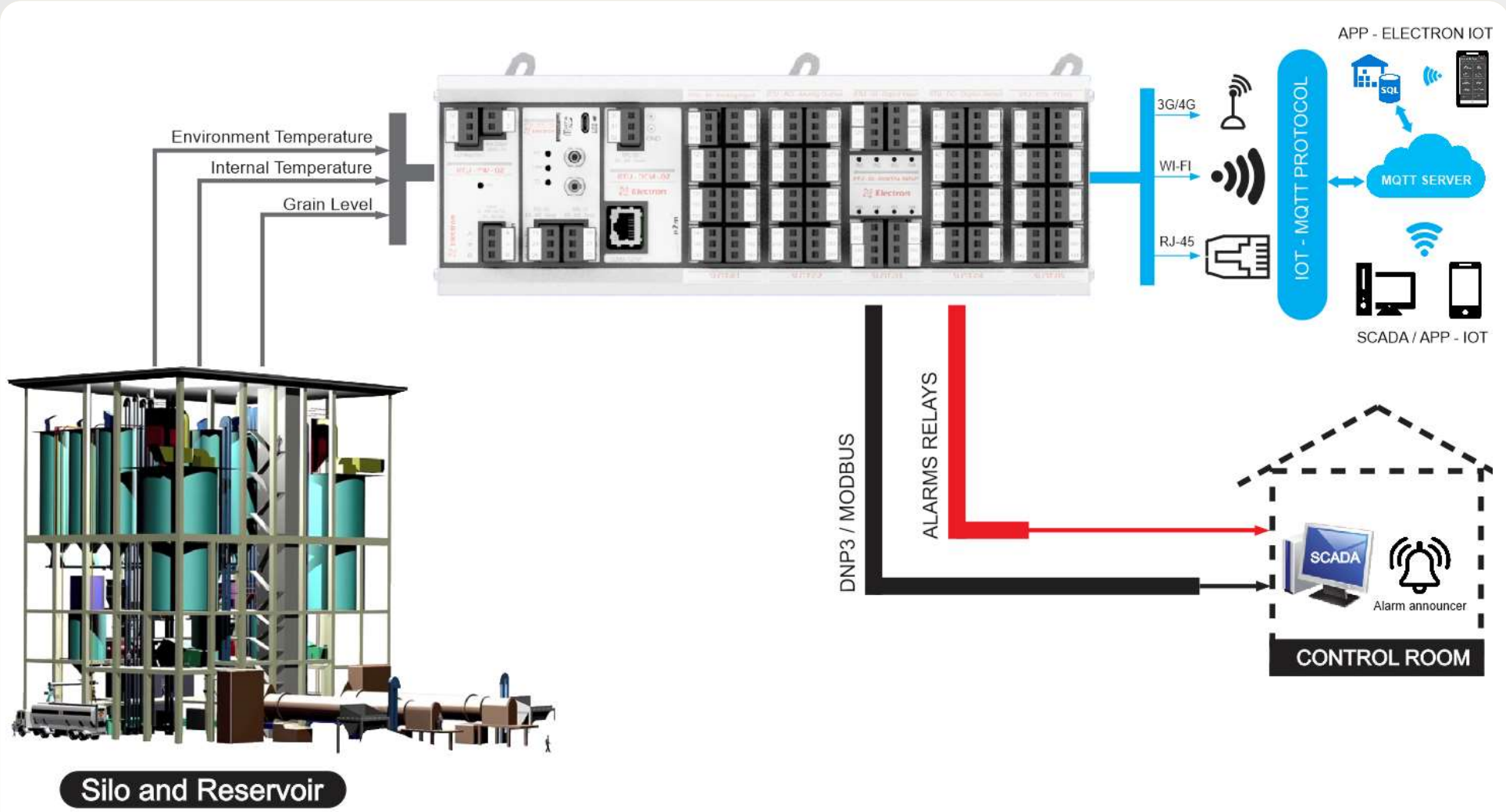
REMOTE TERMINAL UNIT – RTU



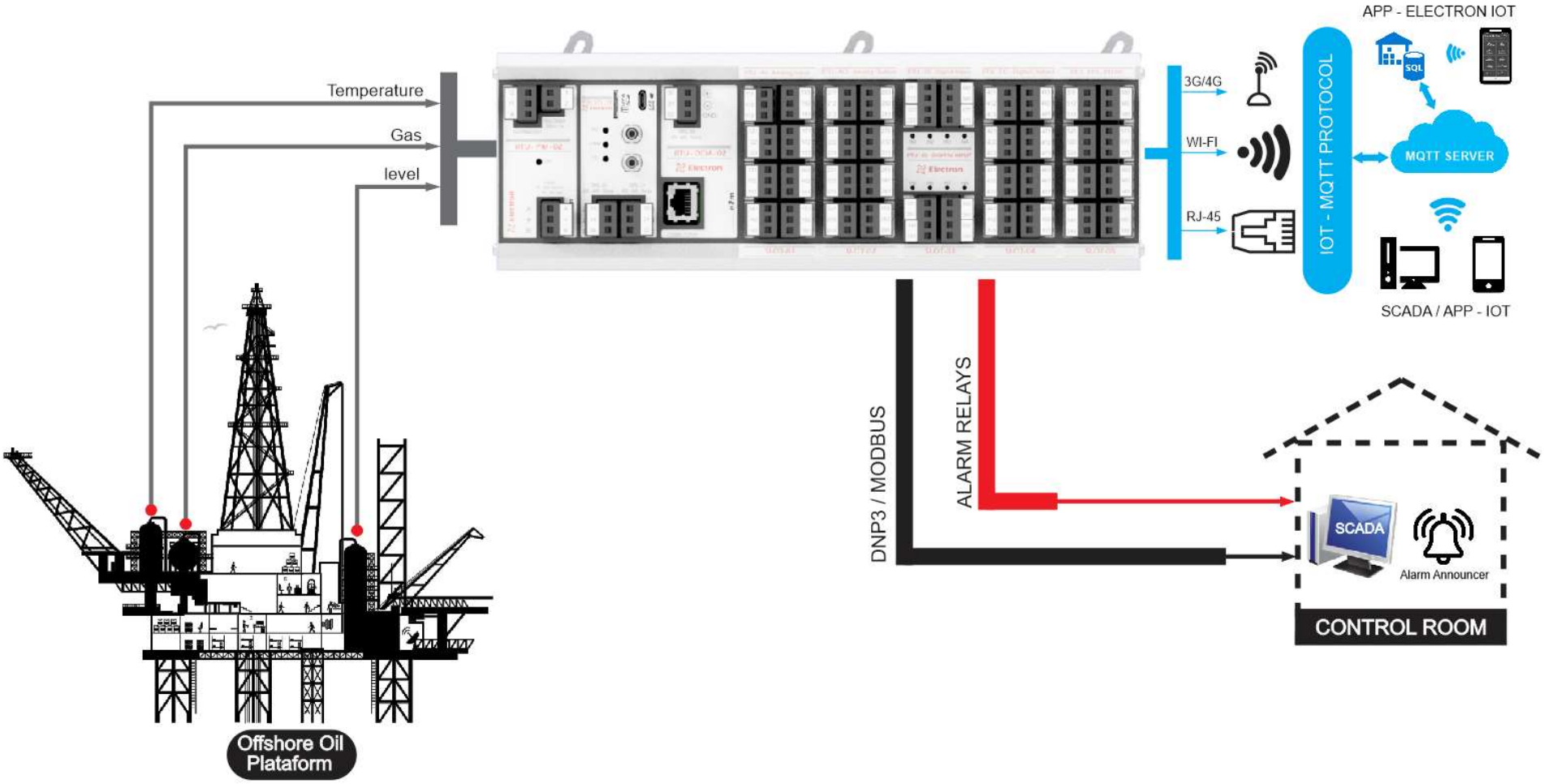
REMOTE TERMINAL UNIT – RTU

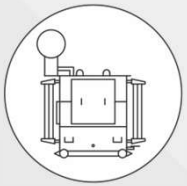


REMOTE TERMINAL UNIT – RTU



REMOTE TERMINAL UNIT – RTU





TEMPERATURE MONITOR – MASTERTEMP (ANSI 26/49/49I)

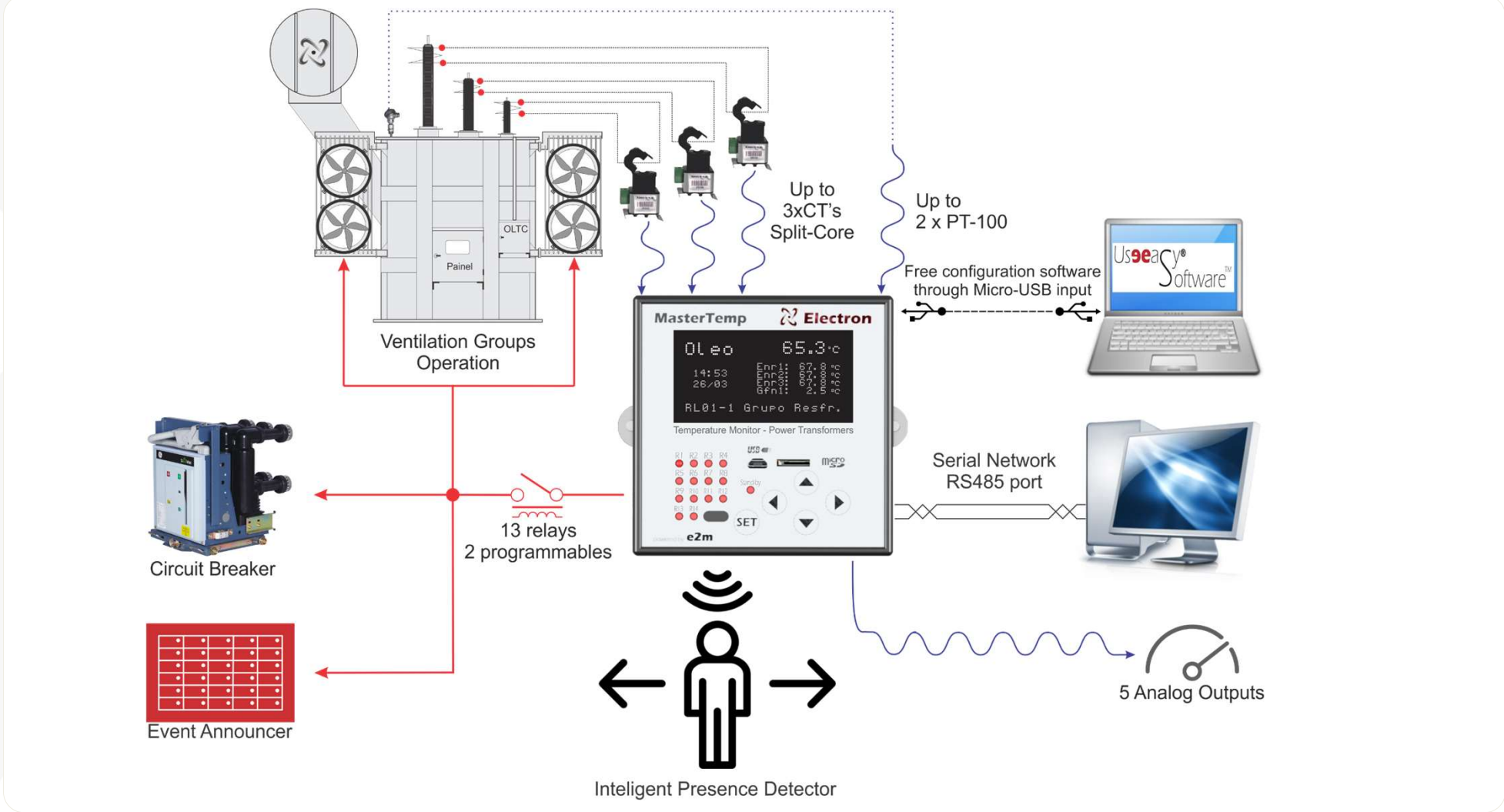


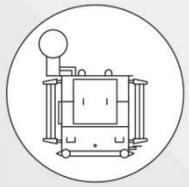
MAIN FEATURES

- Thermal image calculation (Hot Spot) based on IEC 60076-7, IEEE C57.91 and NRB 5356- 7:2017 normative;
- Final Gradient Temperature Calculation for the current load (Oil-winding);
- Life loss calculation of the selectable insulation for Kraft (55°C), stabilized term (65°C) and Nomex (95°C) based on Arrhenius Theory and insulation remaining working life in hours and days;
- Temperature differential calculation between two PT-100 Sensors in order to monitor TAP Changer defects or Cooling efficiency monitoring;
- Time Monitoring of the ventilators operation (Hourmeter) with programmable Alarm for Maintenance Warning;
- Up to Three sectionable CTs, allowing the safe maintenance without Thermal image (bushing) CT secondary disconnection,
- Intelligent OLED screen with Intelligent presence detector sensor function,
- Free equipment Status view and parametrization software,
- Designed, Build and tested according to IEC, IEEE and, NBR Standards directives,
- Digital Output RS485 Modbus RTU or DNP 3.0 to remote access to all measured parameters,

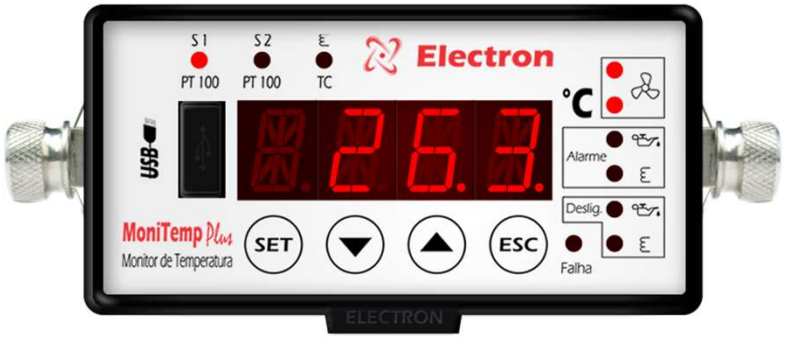
- And much more

TEMPERATURE MONITOR – MASTERTEMP (ANSI 26/49/49I)



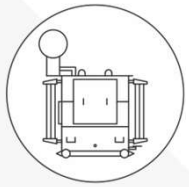


TEMPERATURE MONITOR - MONITEMP PLUS (ANSI 26/49/49I)

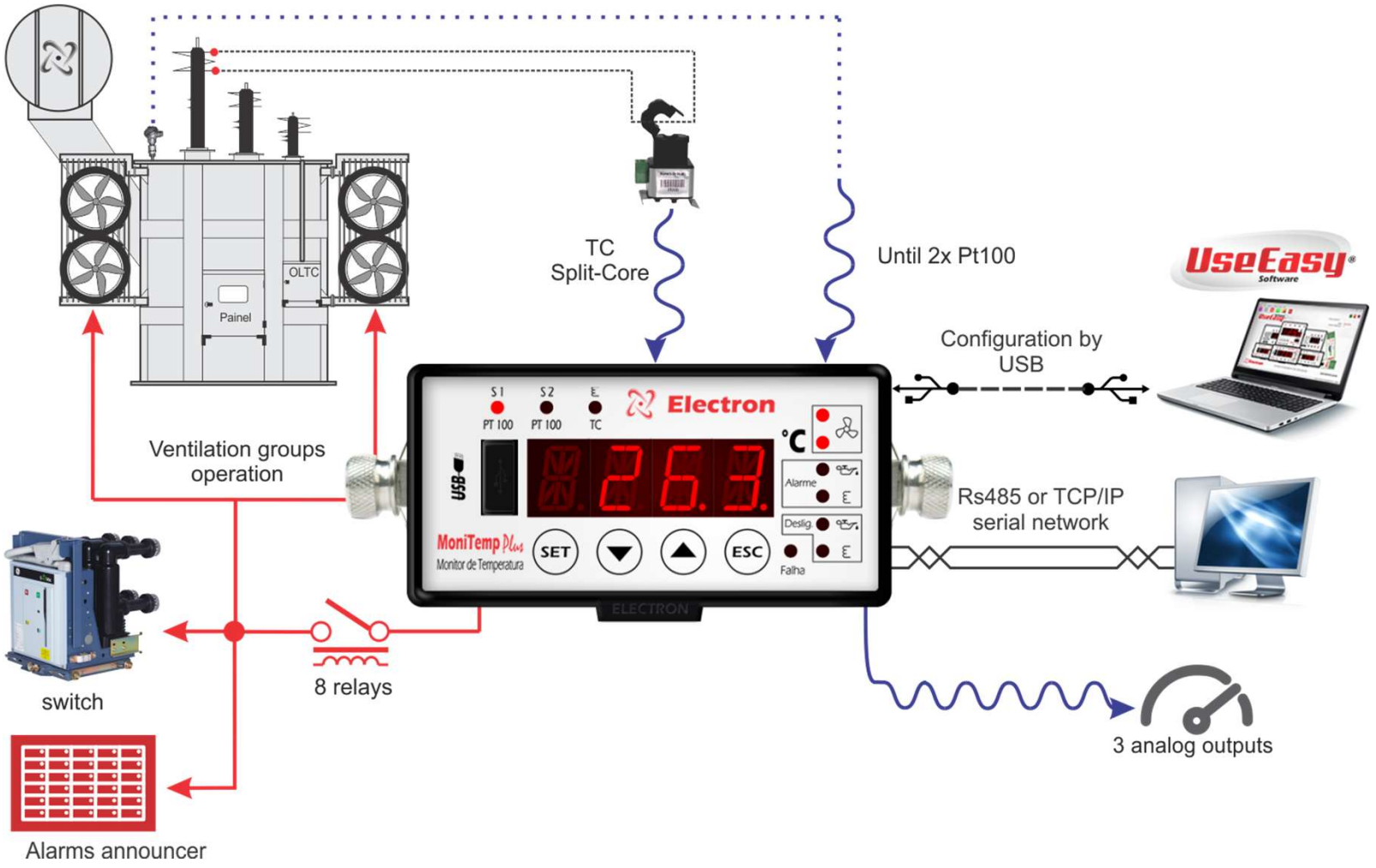


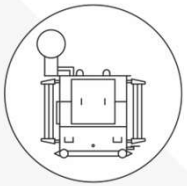
MAIN FEATURES:

- Thermal image calculation (Hot Spot) based on IEC 60076-7, IEEE C57.91 and NBR 5356- 7:2017 normative,
- Commanding of up to 2 cooling groups or pumps,
- Digital output RS485 Modbus RTU or DNP3.0 Level 2
- 8 relays to alarm signalizing, shutdowns (TRIPs) and cooling groups command.



TEMPERATURE MONITOR - MONITEMP PLUS (ANSI 26/49/49I)





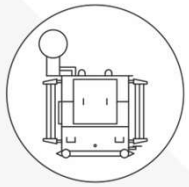
DIGITAL VOLTAGE REGULATOR – DVR (ANSI 90)



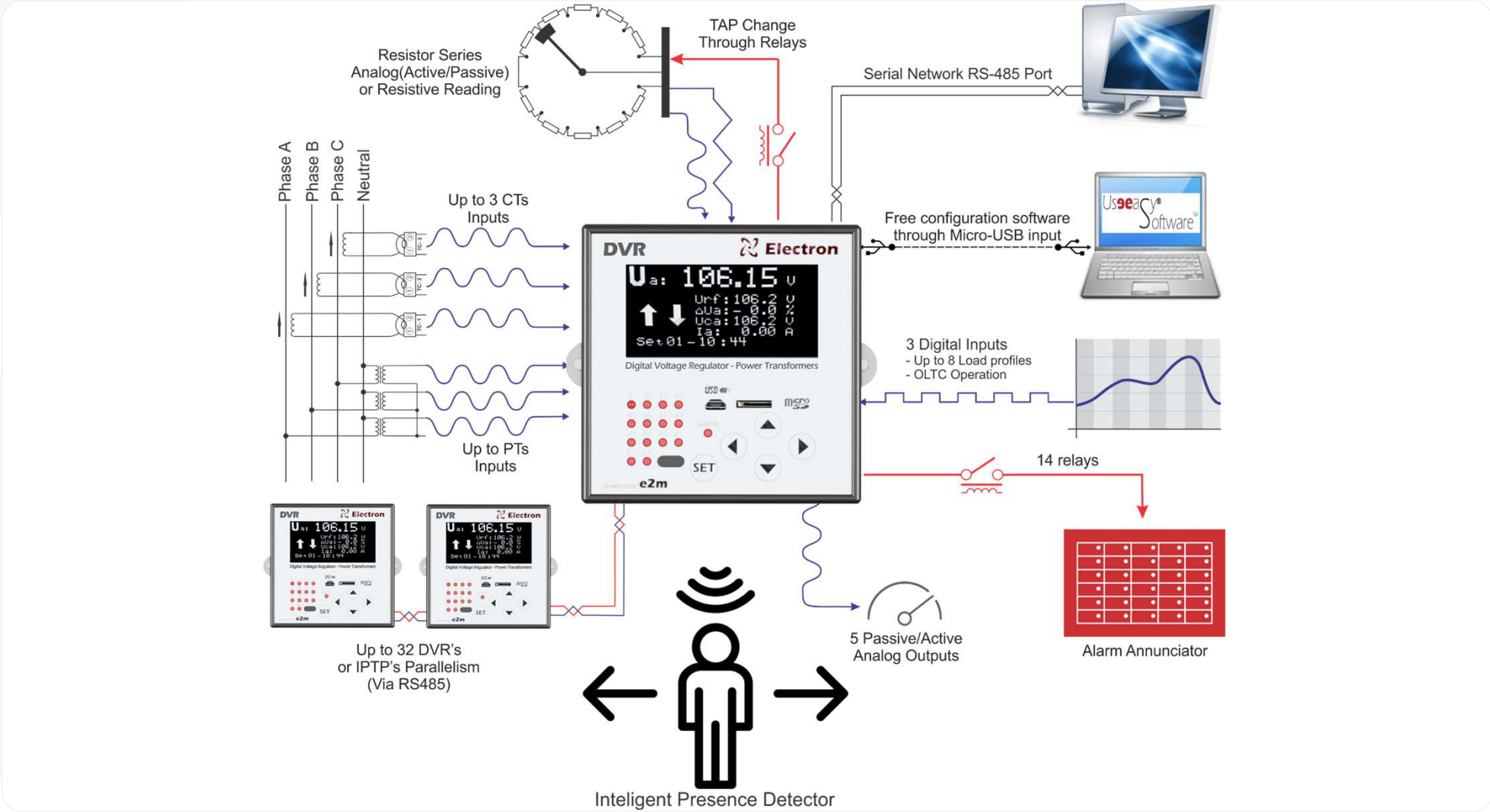
MAIN FEATURES:

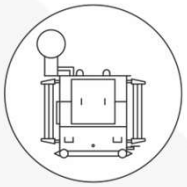
- Automatic Voltage Regulator to compensate line voltage drops,
- Voltage (Vac) and Current (AC) indication fhrough sectionable of the 3 phases on the OLED screen,
- Percentage of deviation and value of the reference voltage, active, reactive and apparent power of the 3 phases,
- Load percentage of the transformer, power factor (cos ϕ) and frequency of the 3 phases,
- OLTC commanding and supervision with TAP indication and actuation (maximum 51 positions – ANSI 90),
- Intelligent OLED screen with Intelligent presence detector sensor function,
- Free equipment Status view and parametrization software,
- 8 programmable load profiles to voltage compensation by resistance, reactance or simply drop percentage,
- It allows connection with up to 32 devices through RS485 output with Modbus RTU and DNP 3.0 (L2) in the same parallelism serial network for Parallelism Command and supervision,
- 14 relays to signaling and commanding with 2 programmable,
- Designed, Build and tested according to IEC, IEEE and, NBR Standards directives,

And much more…

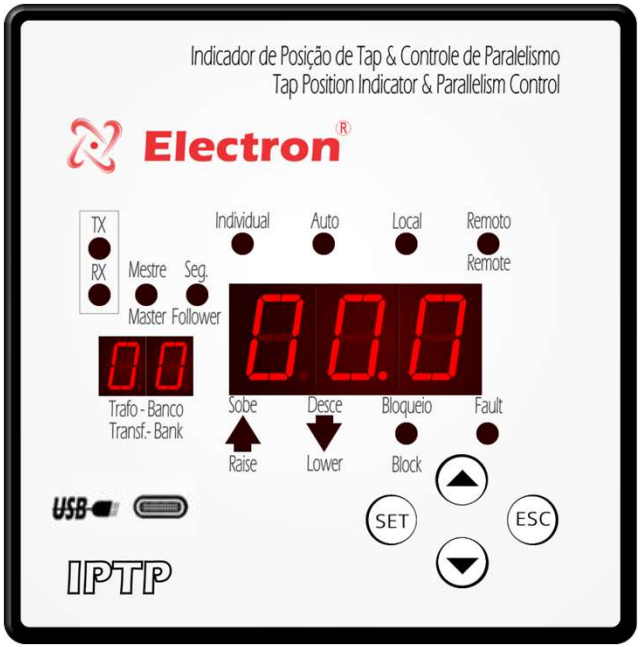


DIGITAL VOLTAGE REGULATOR – DVR (ANSI 90)





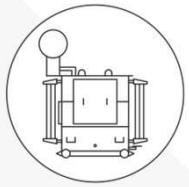
TAP POSITION INDICATOR & PARALLELISM CONTROL - IPTP



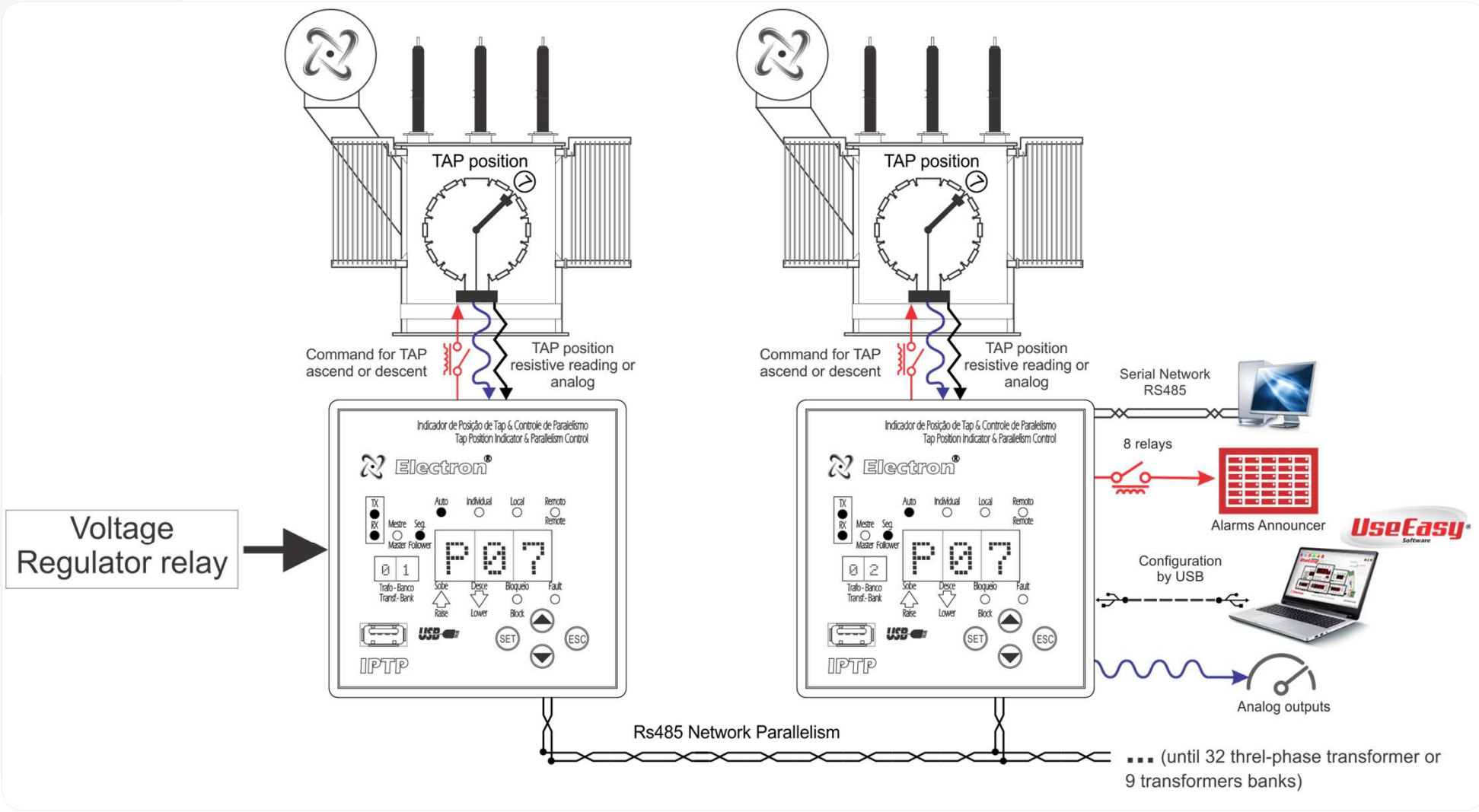
MAIN FEATURES

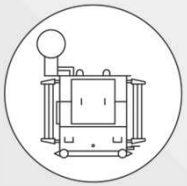
- Independent actuation times to increase and decrease the voltage, with linear, step linear or intense curve timing modes.
- It Contain blockage due to lack of reading of the resistor series, switch block - Raise TAP., switch block – Low TAP, synchronization block with followers, communication blocking in parallelism.
- Contain a failure indication to synchronize with the followers.
- Contain an indication of switching failure – Raise TAP. And Low TAP, indication of communication failure in parallelism, minimum TAP switching failure indication, maximum TAP switching failure indication,
- It *i*ndicates the OLTC TAP Position on the Display.
- High-brightness LED display that is legible and easy to see.
- An easy-to-navigate Menu for configuration, indication, activations, maintenance, transformer parameters. All of these are protected by password.
- Up to Parallelism up to 32 devices and selection menu of up to 9 Banks of Transformers in the Parallelism Control network.
- Measurement range from 0 to 50 positions (0 to 5000 ohms), maximum step of 100 ohms.
- Signal input, in mA or Resistive, from the OLTC Resistor Series.
- Total reading of the resistance of the Resistor Series and Automatic calibration of the number of steps.
- An indication of numerical, bilateral numerical and alphanumeric TAP position reading.
- Designed, Build and tested according to IEC, IEEE and, NBR Standards directives,

And much more…



TAP POSITION INDICATOR & PARALLELISM CONTROL - IPTP



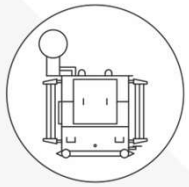


TAP POSITION INDICATOR - IPTE

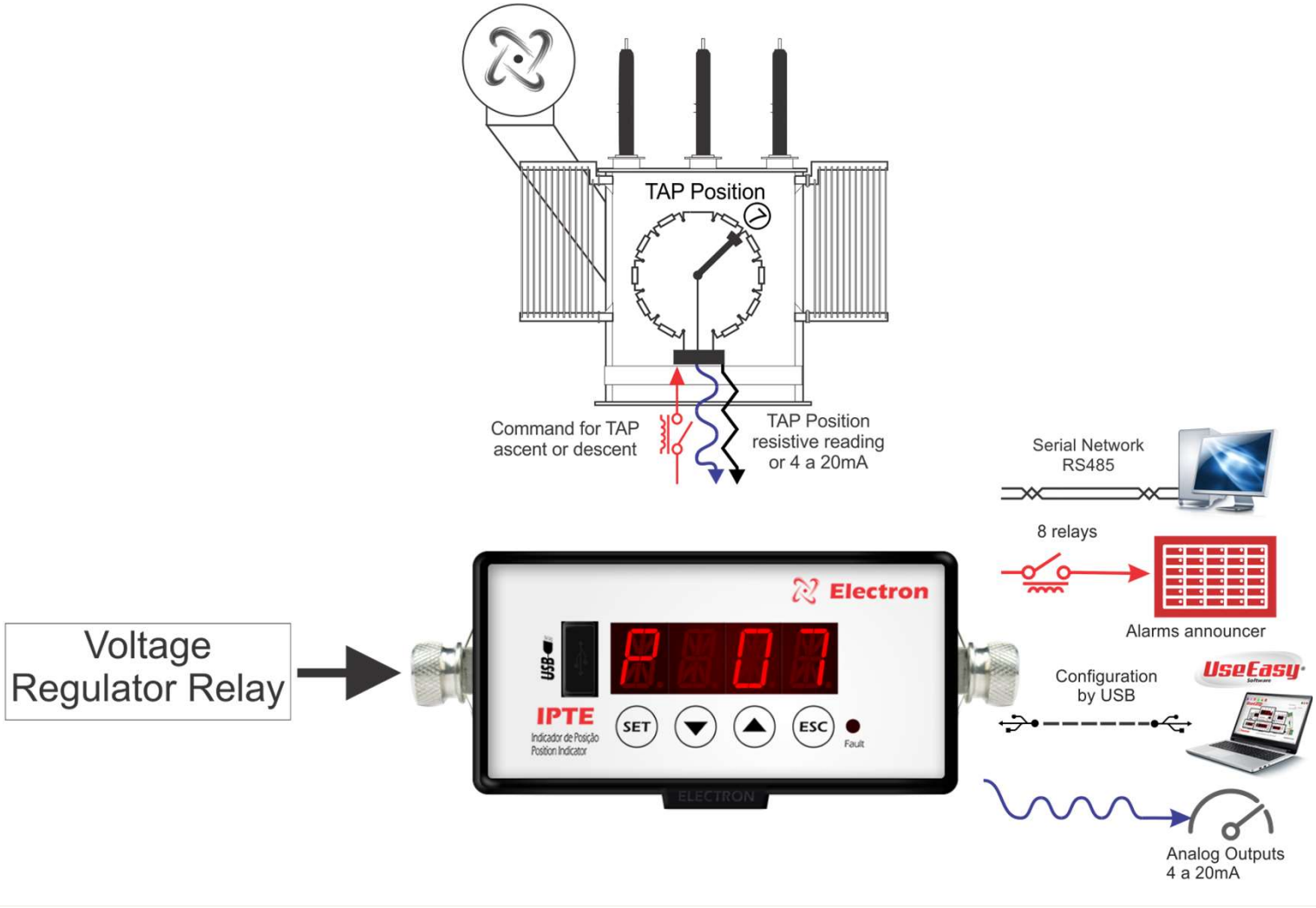


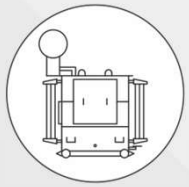
MAIN FEATURES

- 4-digit high-brightness display, height 20 mm and decimal place 13 mm (red);
- Measurement range from 0 to 50 Positions (0 to 5000 Ohms) maximum step of 100 Ohms;
- Signal input from the Potentiometric Crown (milliAmpere or resistive);
- Universal power supply 48 to 265 Vdc / Vac; • RS-485 Digital Output (ANSI / TIA / EIA-485-A) with Modbus RTU and DNP 3 (Level 1) protocol for remote access to all measured parameters;
- Analog 0 to 1 mA, 0 to 5 mA, 0 to 10 mA, 0 to 20 mA and 4 to 20 mA configurable directly on the front;
- Front USB 2.0 for parameterization through UseEasy ™ software;
- Stores the maximum and minimum TAP achieved in the period in memory;
- Fault Indication Contact (Watchdog);
- Enclosure of high mechanical resistance, built entirely in aluminum;
- Degree of protection IP20 (NBR IEC 60529);

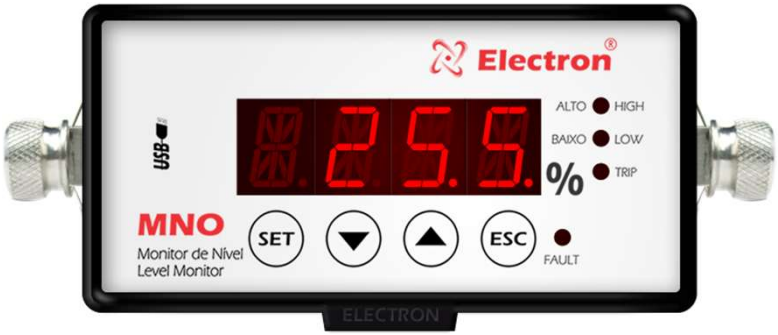


TAP POSITION INDICATOR - IPTE





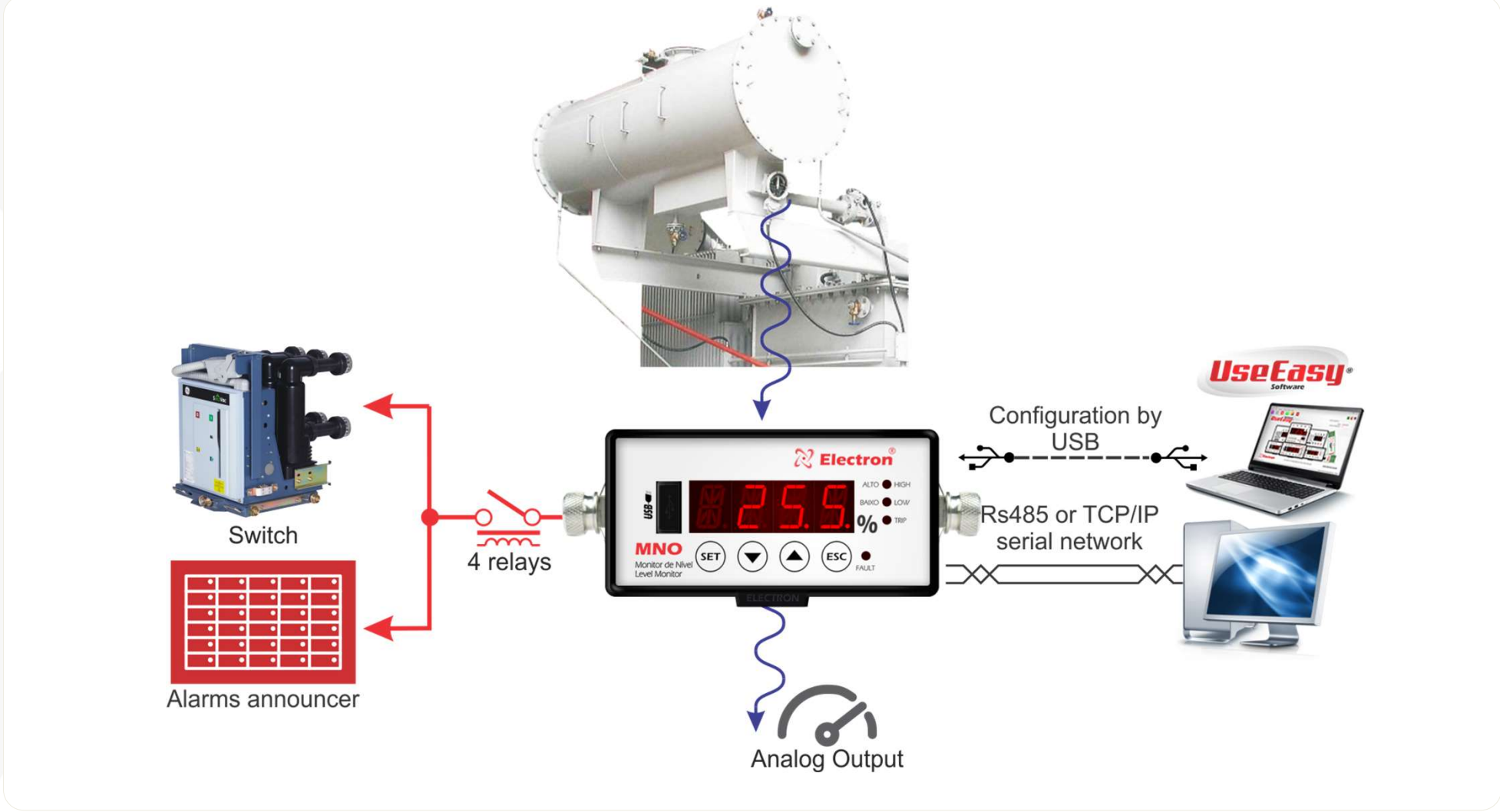
OIL LEVEL MONITOR – MNO (ANSI 71/71C)

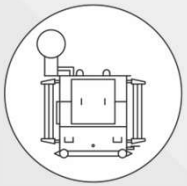


MAIN FEATURES:

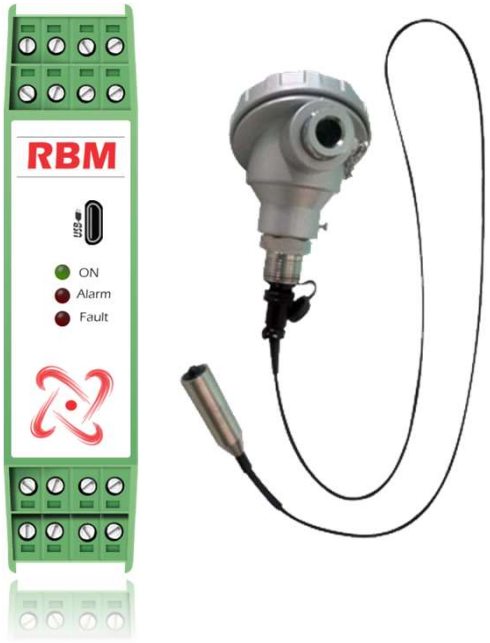
- OLTC tank and main transformer tank Oil level monitor,
- Digital Output RS485 Modbus RTU or DNP 3.0,
- High resistance enclosure built in aluminum,
- 3 configurable levels of alarms,
- Analog output: 0...1, 0...5, 0...10, 0...20 or 4...20 mA,

OIL LEVEL MONITOR – MNO (ANSI 71/71C)



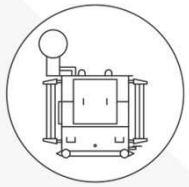


AIR CELL RELAY – RBM

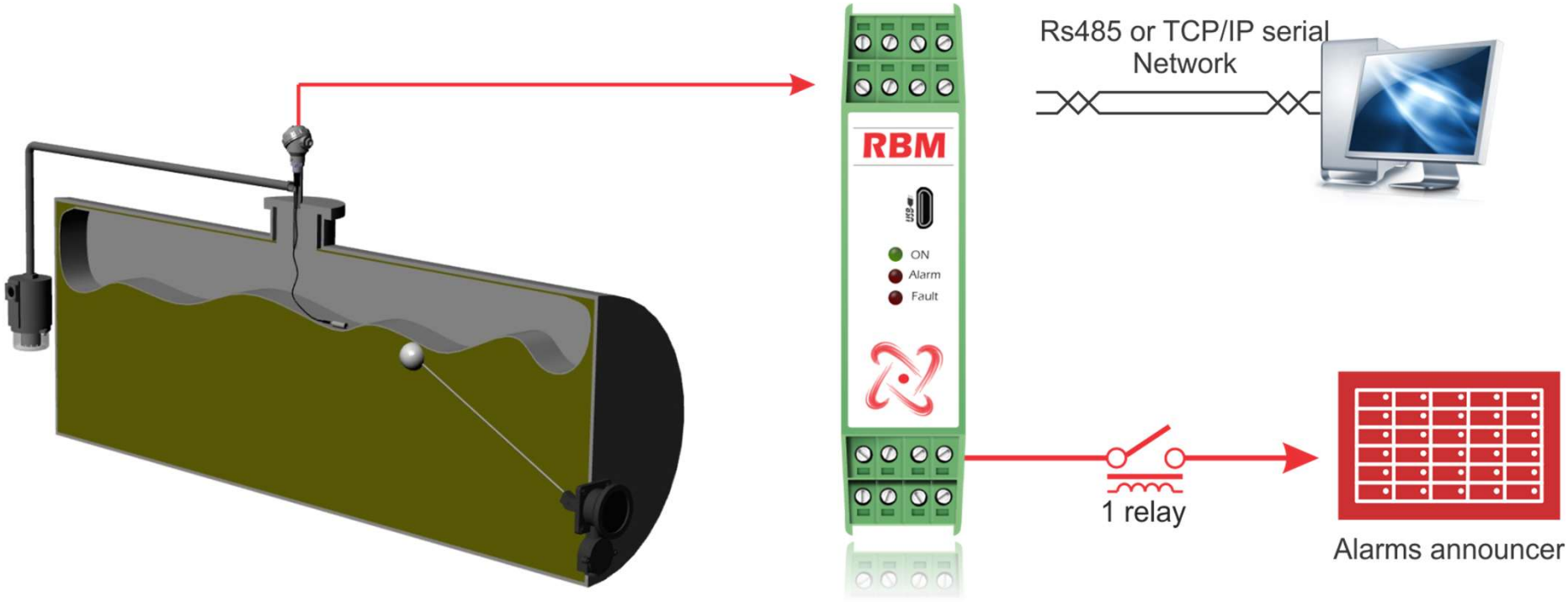


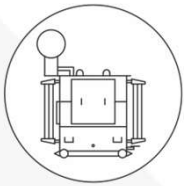
DESCRIPTION

- Relay for internal leakage detection and monitoring of the conservatoir air cell rupture,
- Application for leakage detection,
- Stainless steel AISI 304 liquid detection sensor,
- Digital output RS485 Modbus RTU or DNP 3.0 Level 1,
- Connectors with pluggable system,



AIR CELL RELAY – RBM





TIIE OLTC



MAIN FEATURES:

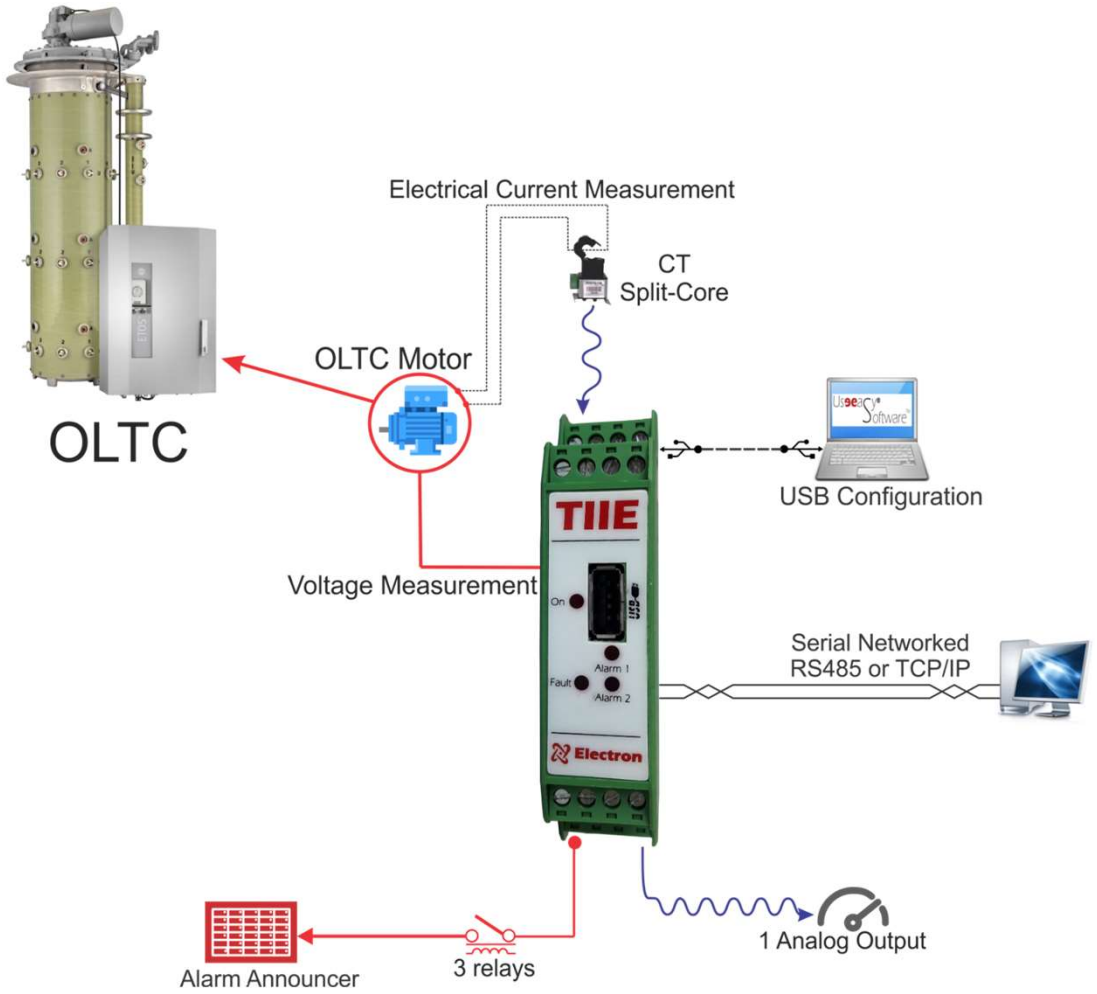
- **Single Phase Measurement of the OLTC Motor:**
  - Current Voltage Measurement;
  - Maximum Voltage reached during Operation;
  - Average Voltage Calculated after the motor stabilization;

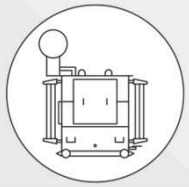
- **Electrical Current Measurement of the OLTC Motor:**
  - Electrical Current Measurement;
  - Motor Starting peak during operation;
  - Electrical current Average after the motor stabilization;

- **Active Power measurement of the OTLC Motor:**
  - Current Power Measurement;
  - Maximum Power reached during operation;
  - Power average measured after the motor Stabilization;

- Motor Operation time counter of the OLTC motor at every operation.
- Total Operation time counter of the OLTC Motor.
- Total operation time count of the OLTC Motor (Day/Hour/Month/Week).
- Total operation number count of the OLTC Motor (#).
- Anomaly Alarm Relay at the start or/and during the Motor operation regarding. signature (Electrical Current, Voltages, Power and Operation Time).
- Machine Learning Function, the TIIE-OLTC Stores the Motor signature during the TAP Changer changing position and it allows to set a positive(+) or negative(-) percentual value to trigger the alarm.
- Operation Registers Subsequent in inferior time to 1 second and register until 50 oscillographs on Mass Memory (FIFO).

TIIE OLTC


OLTC
Electrical Current Measurement
CT
Split-Core
OLTC Motor
USB Configuration
TIIE
Voltage Measurement
Serial Networked
RS485 or TCP/IP
Alarm Announcer
3 relays
1 Analog Output



UNIVERSAL SIGNALS MONITOR - MONIUNI

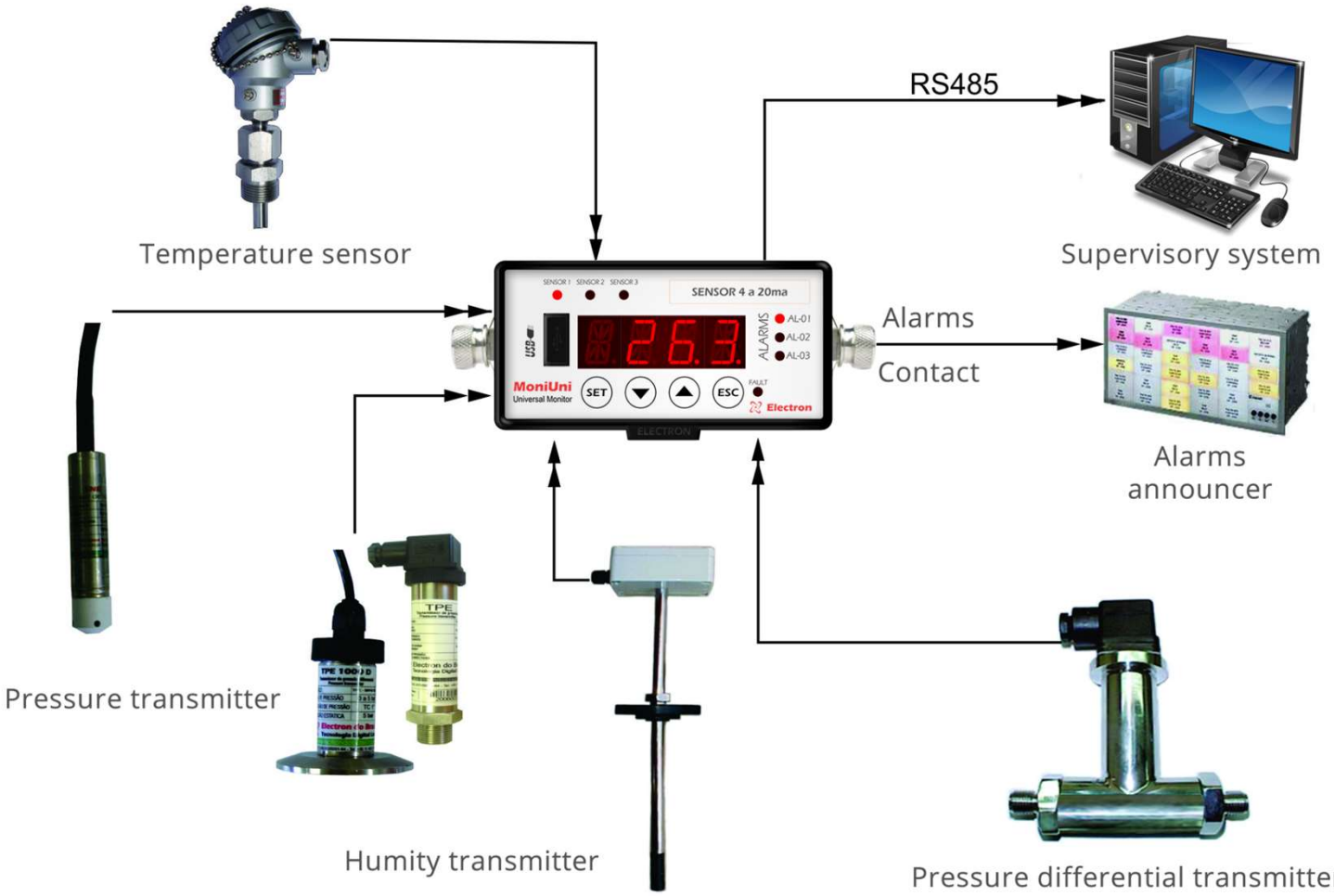


MAIN FEATURES:

- Universal signals monitor;
- Up to 3 sensors (PT100, Cu-10, analog or resistive signal inputs);
- Analog output 0..1, 0..5, 0..10, 0..20 or 4..20 Ma;;
- Digital output RS485 Modbus RTU or DNP 3.0 Level 1;
- Actuation of pumps, fans or heaters at the frontal panel;

UNIVERSAL SIGNALS MONITOR - MONIUNI

Application solution for MoniUni, Indication and control of many greatness.



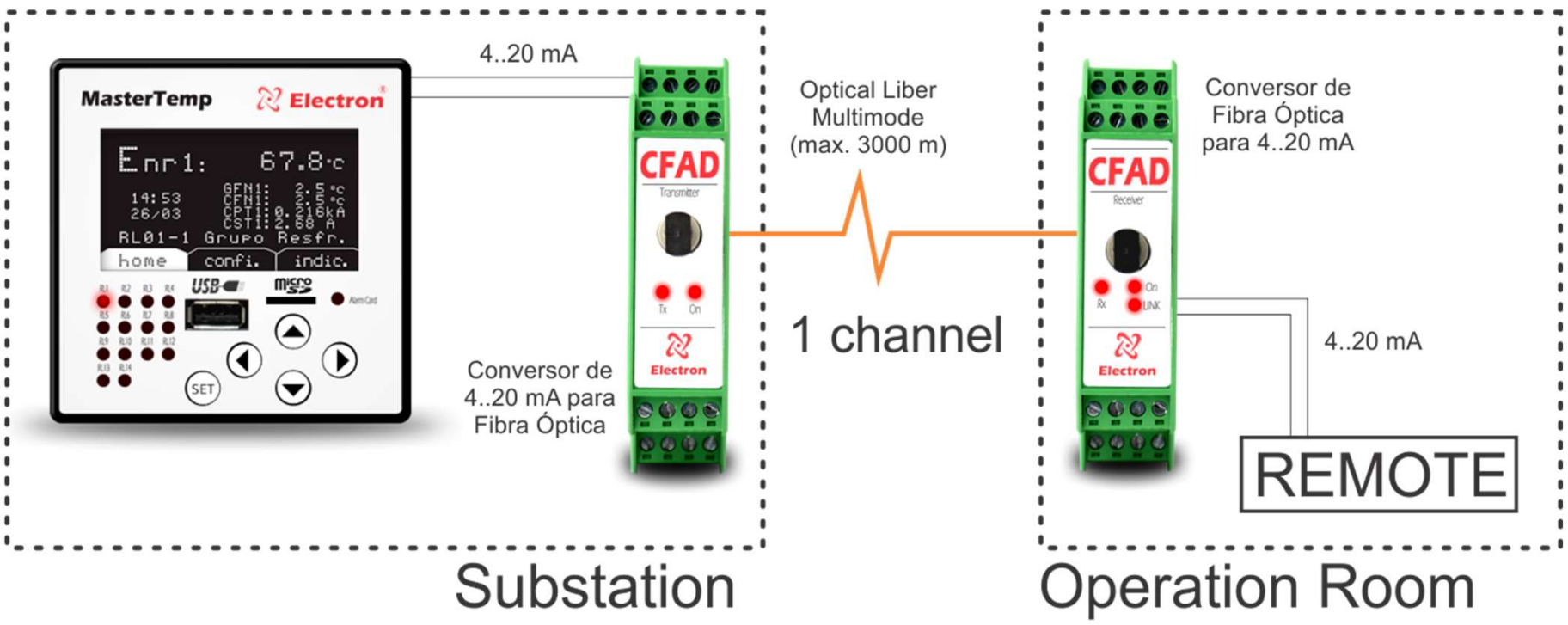
SIGNAL CONVERTERS



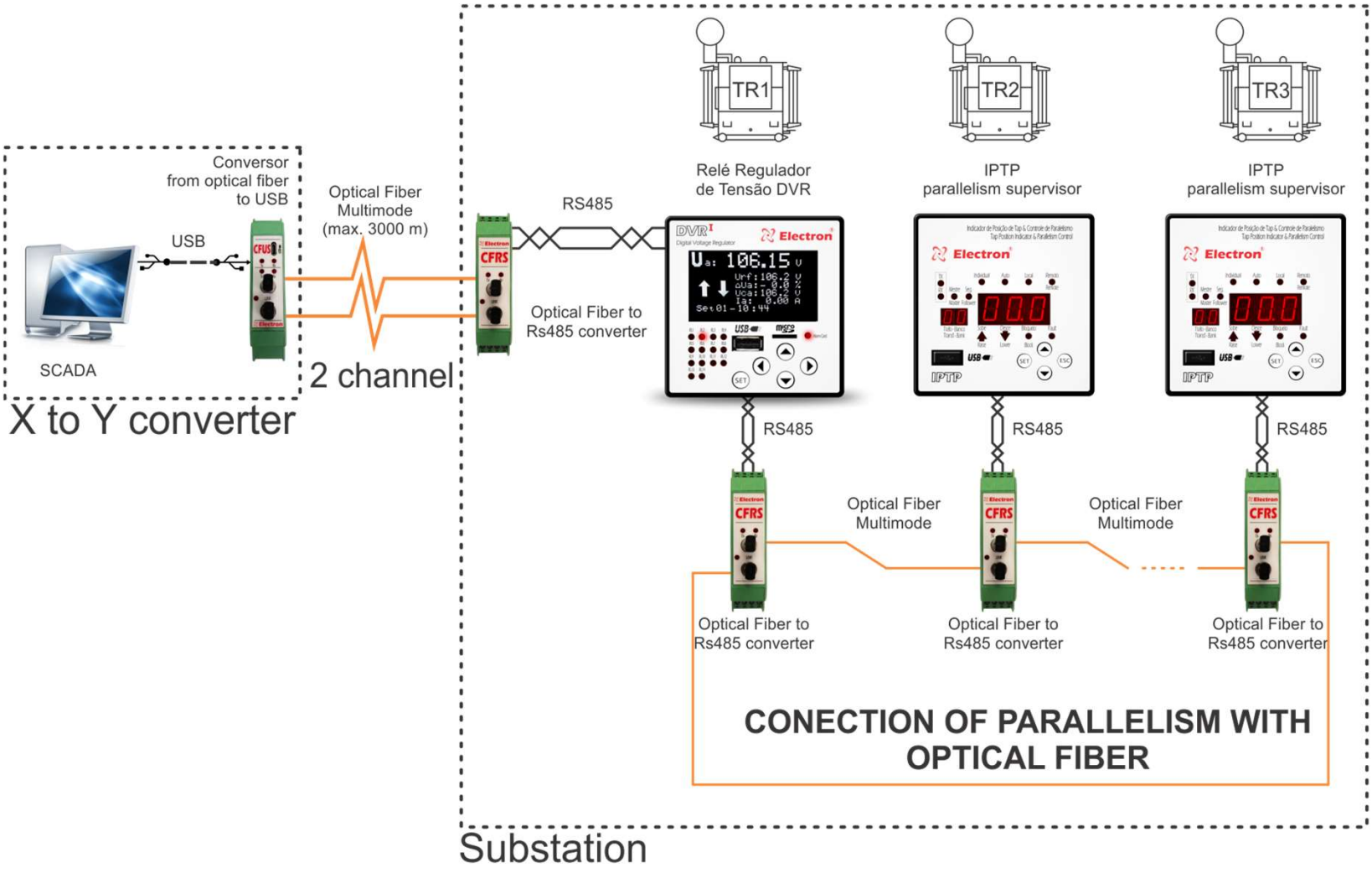
MAIN FEATURES:

- Serial signals converters that operate with the following communications protocols: optical fiber, RS485 (2 wires) and USB 2.0
- Up to 32 devices on the net
- Resistant to lightning strikes and damages caused by electrostatic discharges
- Resistant to EMI/RFI and electric current oscilations, ideal for data communication close to transformers, heavy electric equipments and other type of interferences
- Allows connection in ring architecture, dismissing use of Switches

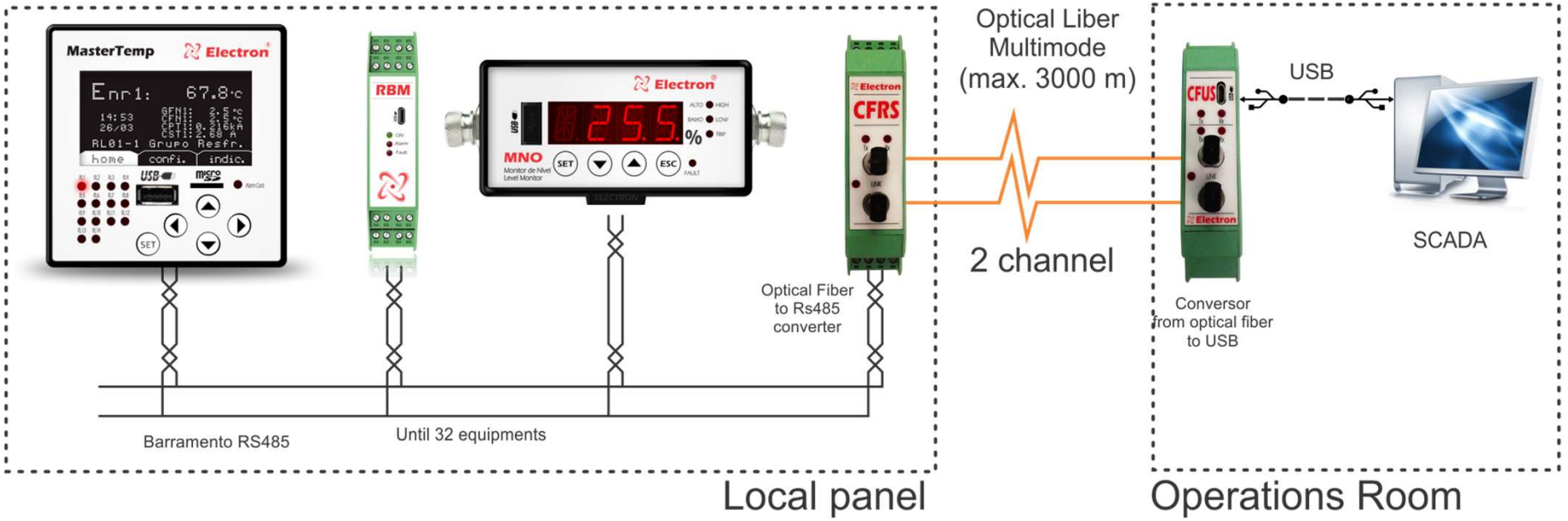
SIGNAL CONVERTERS APPLICATION



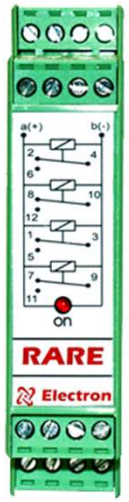
SIGNAL CONVERTERS APPLICATION



SIGNAL CONVERTERS APPLICATION



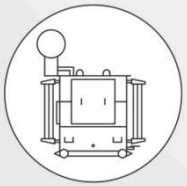
RAPID AUXILIAY RELAY - RARE





MAIN FEATURES:

- Auxiliary relay with fast operation response,
- Operation time: 2,5 ms (2 A); 7 ms (4 or 10 A),
- Release time: 1,5 ms (2 A); 4 ms (4 or 10 A),
- The most compact in the market,
- Protection against polarity inversion,
- Operation redundancy (double contacts),
- Bounce filter (internal protection for contacts),



LOCKOUT RELAY - RB-86





MAIN FEATURES:

- Lockout relay for function ANSI 86;
- Manual operation return via frontal relay button;
- 2 relays NOC of 10 A in 220 Vac or 0,5 A in 125 Vcc to operate up to 10^5 times;
- Connectors with pluggable system;

TERMINAL HEAD RTD PT100



MAIN FEATURES

- Meets requirements of standards IEC, IEEE, DIN and ABNT,
- Ideal for installations subject to weather and electrical disturbances,
- Head in injected aluminum IP65,
- Bulb in stainless steel AISI 304,
- Adjustable gland,

ENVIRONMENT TEMPERATURE MEASUREMENT SHELTER



MAIN FEATURES

- Weather shelter of multiple plates,
- Protection for sensors (temperature and relative umidity) against rain and solar radiation,
- 8 anodized aluminium plates separated by spacers in nylon, assuring the product does not suffer with corrosion,

OUTDOOR CABINET FOR IEDs



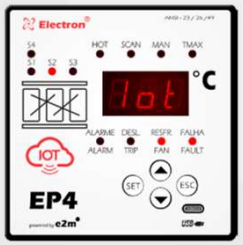
MAIN FEATURE

- Special cabinet for outdoor installation IP54, double door with glass protection for UV radiation.

Electron

IEDs Solutions for Dry Type Cast Resin Transformer





















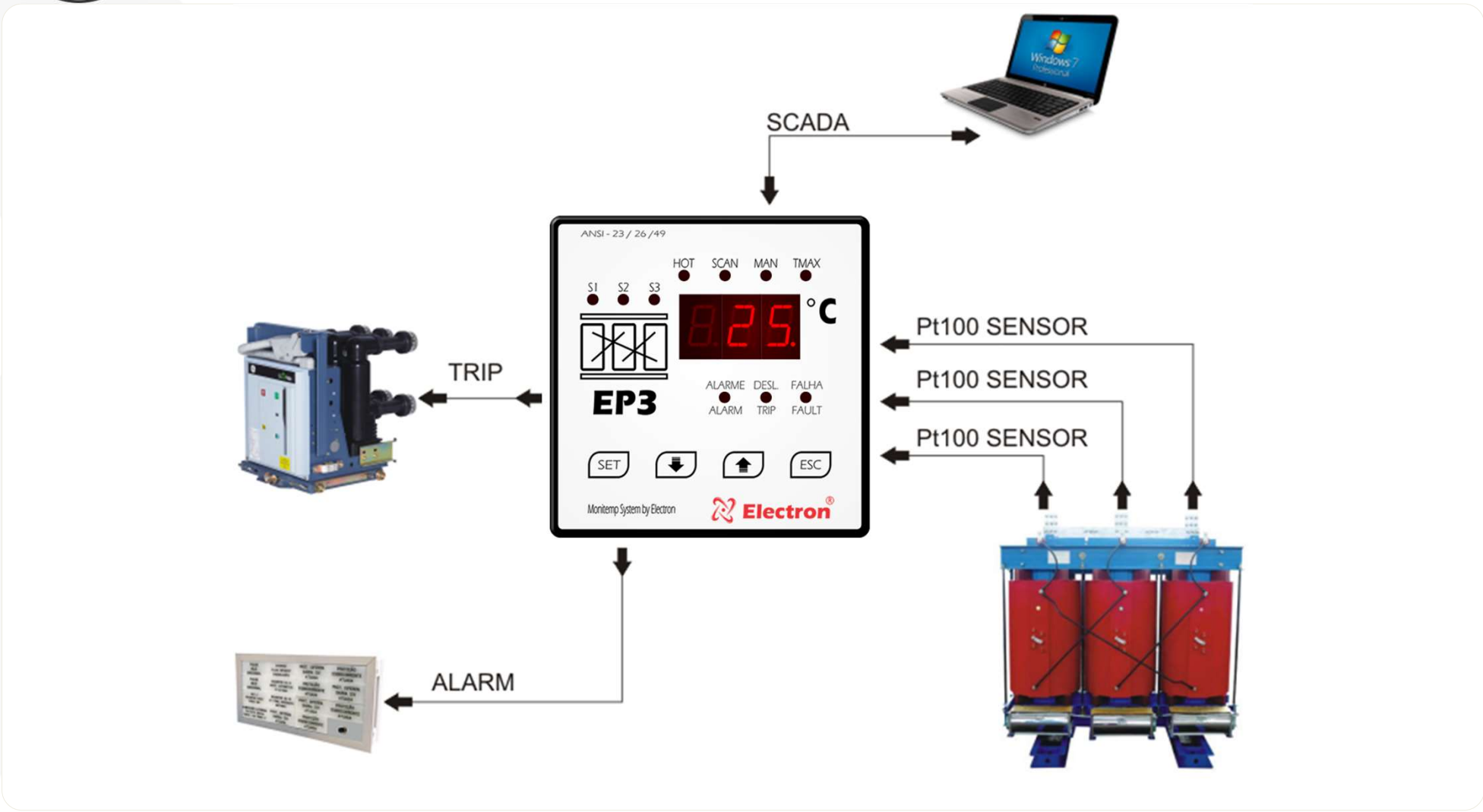
THERMAL PROTECTION RELAY – EP3



MAIN FEATURES:

- Thermal Protection Relay,
- Up to 3 PT100,
- According to ANSI 23, 26 and 49,
- 2 independent temperature setpoints per sensor
- 2 isolated actuation relays (NOC): alarm or shutdown,

THERMAL PROTECTION RELAY – EP3



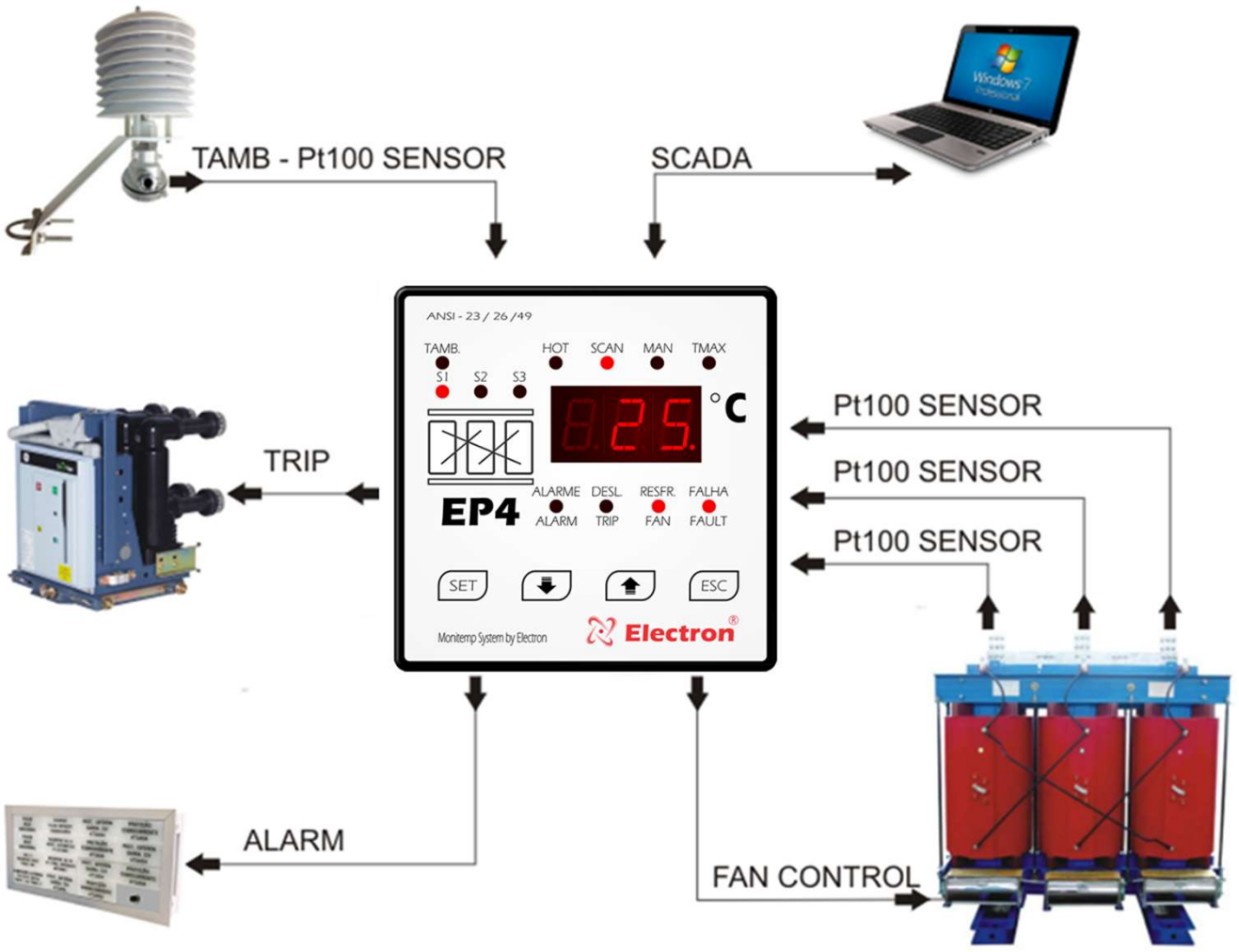
THERMAL PROTECTION RELAY – EP4



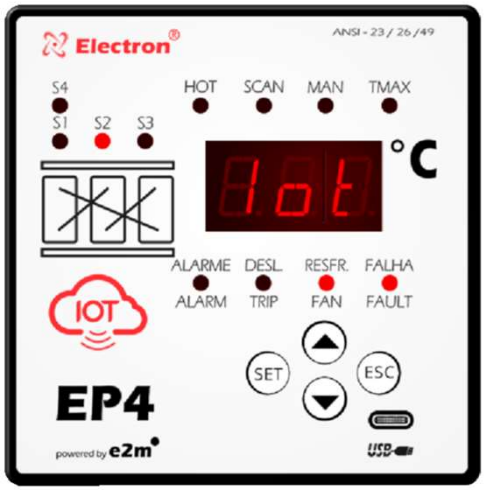
MAIN FEATURES:

- Thermal Protection Relay,
- Up to 4 PT100,
- According to ANSI 23, 26 and 49,
- 3 independent temperature setpoints per sensor,
- 3 isolated actuation relays (NOC): alarm or shutdown,
- Optional: up to 2 fan groups actuation,

THERMAL PROTECTION RELAY – EP4



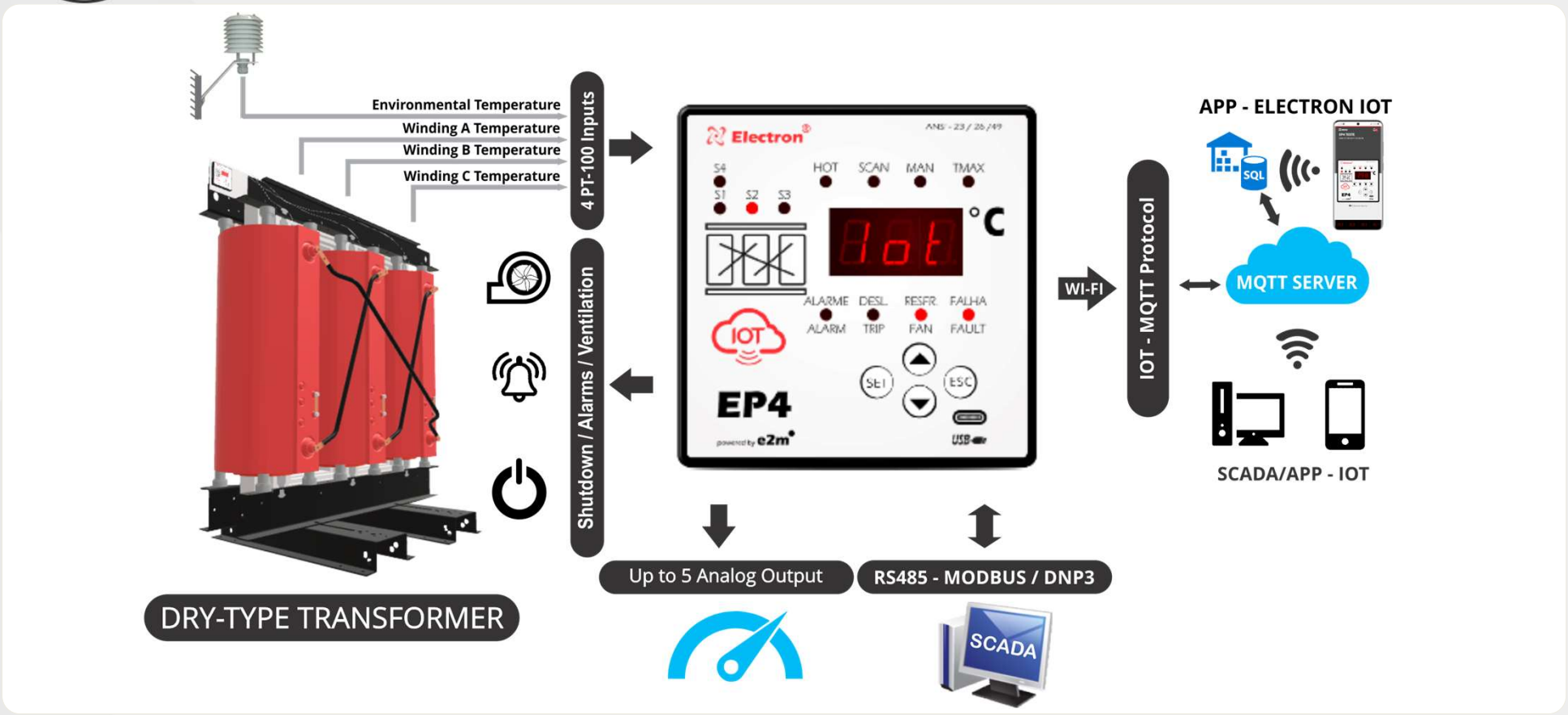
THERMAL PROTECTION RELAY – EP4 IoT (ANSI 23/26/49)



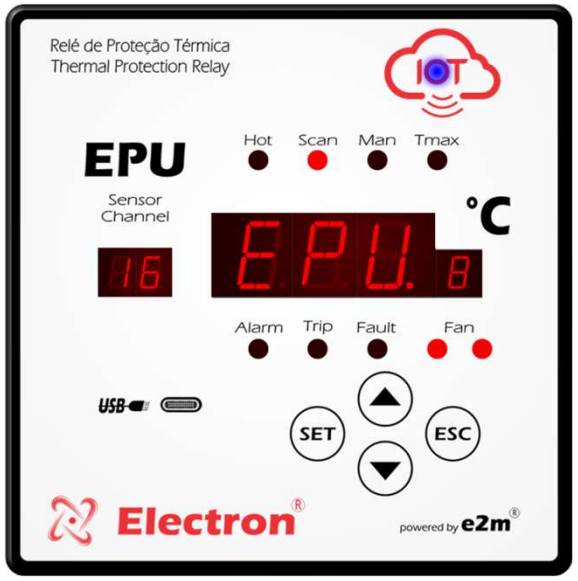
MAIN FEATURES:

- Integrated WIFI Modem,
- Bluetooth Module,
- Micro USB for Software parametrization,
- RS485 output,
- Up to 4 RTD PT100 or Cu10 Sensors,
- Modbus RTU, DNP3 level 1 and MQTT as communication Protocols,
- 3 independent temperature SEPOINTS per Temperature Sensor,
- 2 isolated actuation relays (NOC): alarm or shutdown,
- Up to 2 Cooling groups relays outputs,
- 1 Active and Passive configurable Analog Output,

THERMAL PROTECTION RELAY – EP4 IoT (ANSI 23/26/49)



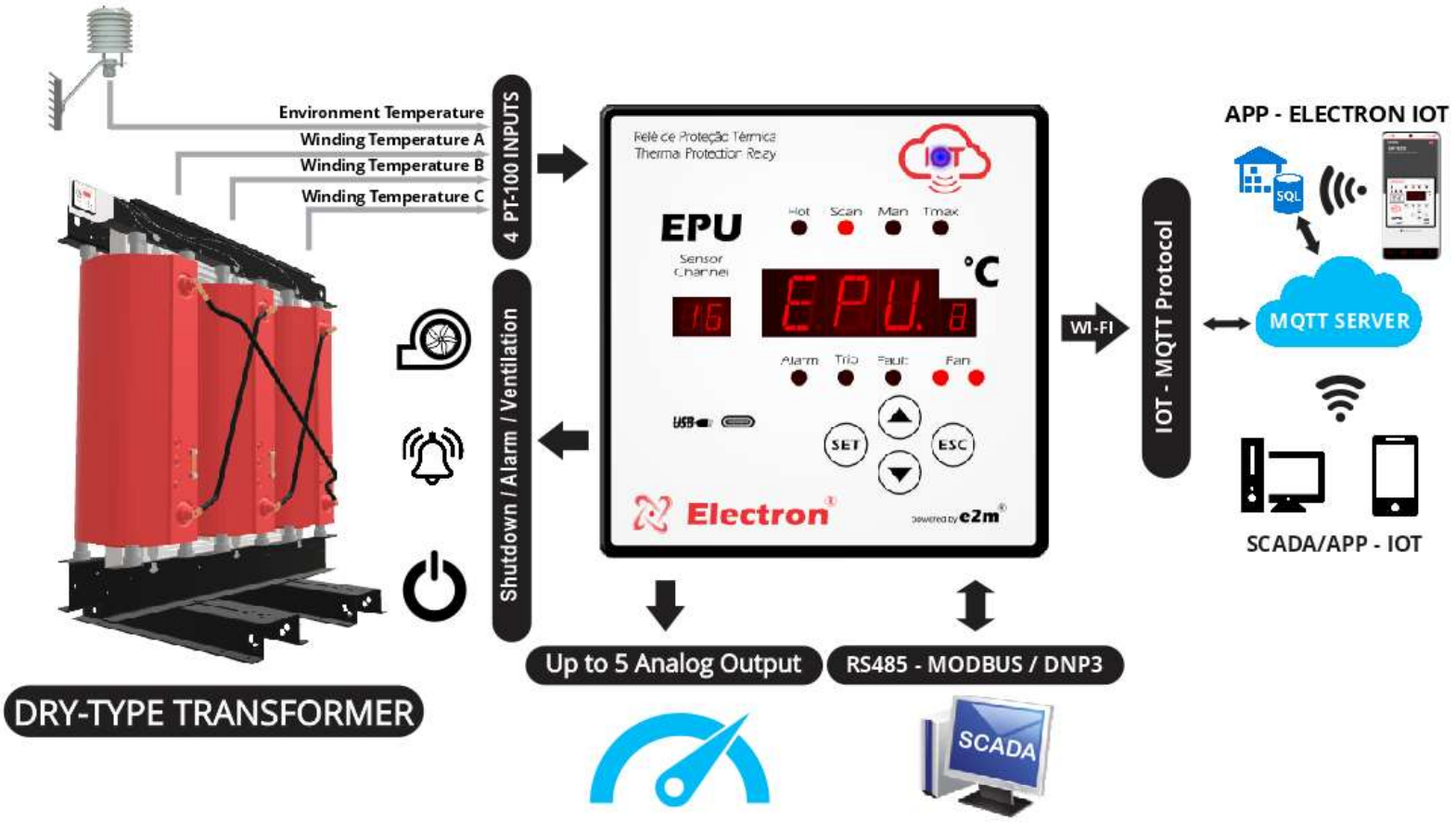
UNIVERSAL THERMAL PROTECTION RELAY – EPU (ANSI 23/26/49)



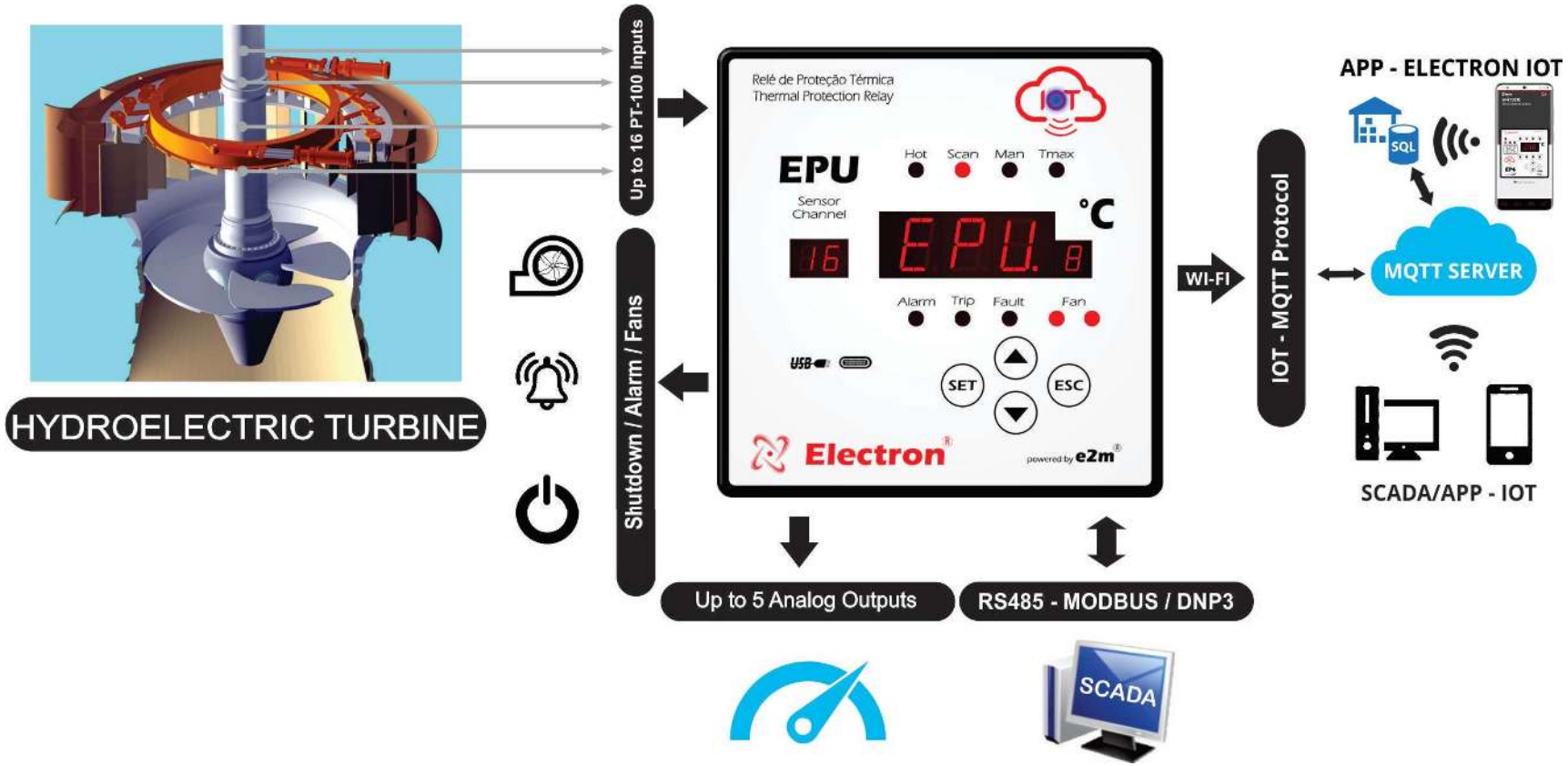
MAIN FEATURES:

- Integrated WIFI Modem,
- Bluetooth Module,
- Micro USB for Software parametrization,
- RS485 output,
- Up to 16 RTD PT100 or Cu10 Sensors,
- Modbus RTU, DNP3 level 1 and MQTT as communication Protocols,
- 3 independent temperature SEPOINTS per Temperature Sensor,
- 2 isolated actuation relays (NOC): alarm or shutdown,
- Up to 2 Cooling groups relays outputs,
- Up to 5 Active and Passive configurable Analog Output,

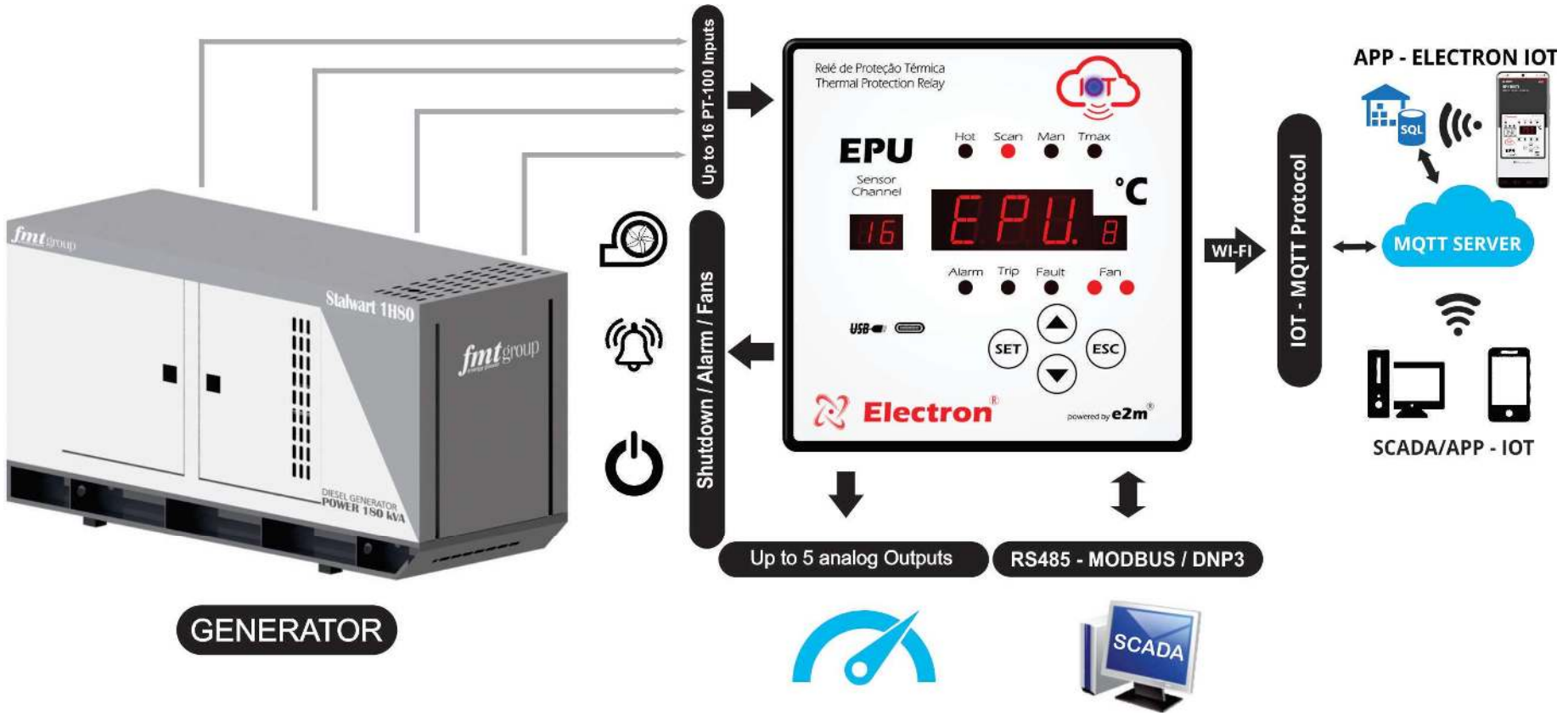
UNIVERSAL THERMAL PROTECTION RELAY – EPU (ANSI 23/26/49)



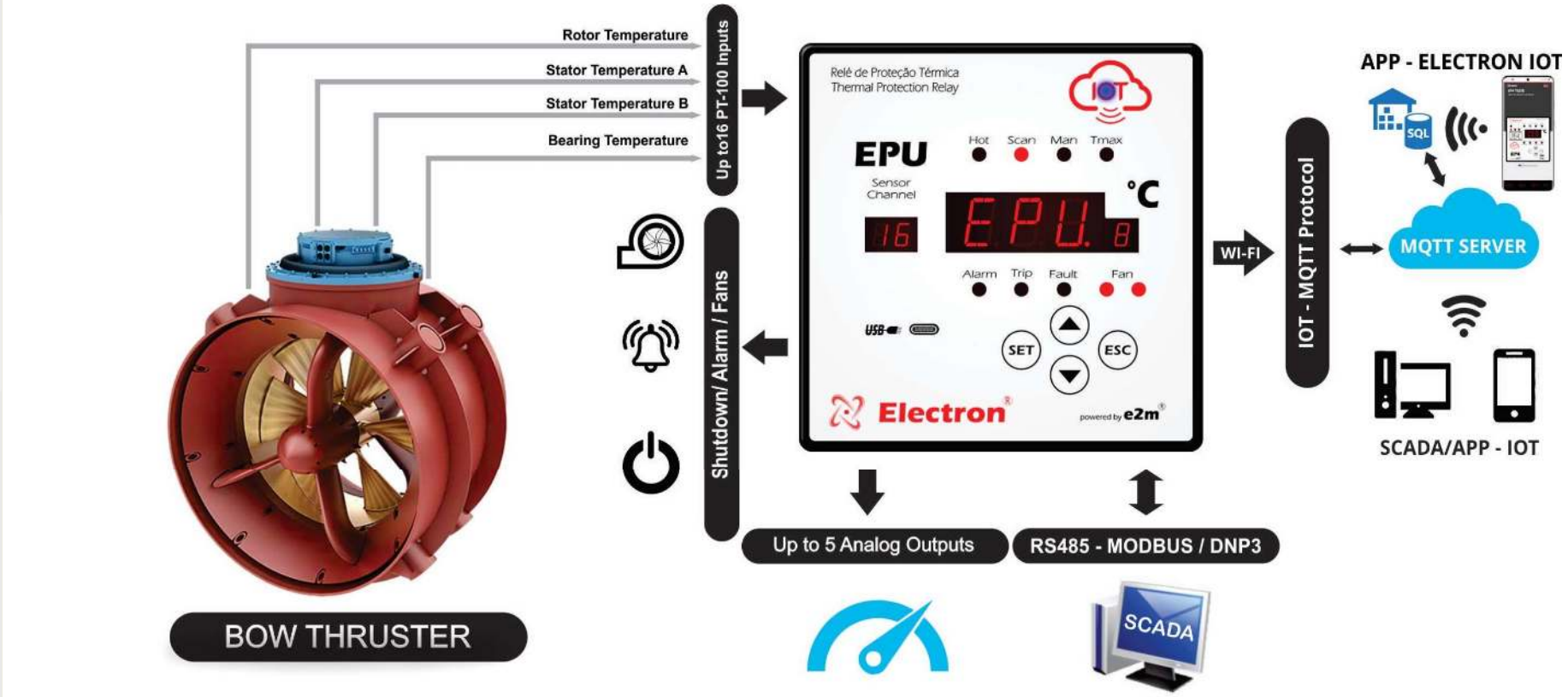
UNIVERSAL THERMAL PROTECTION RELAY – EPU (ANSI 23/26/49)



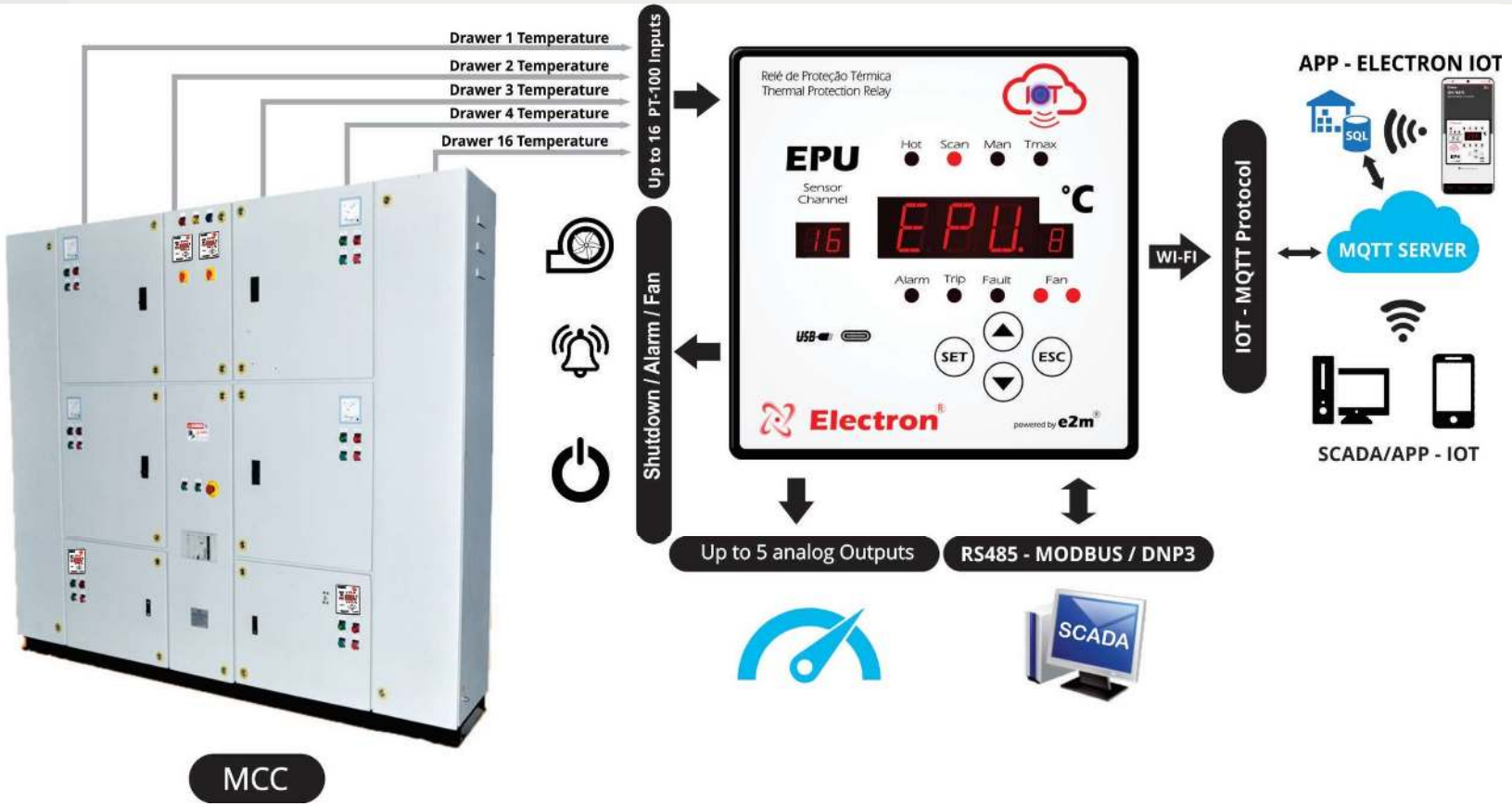
UNIVERSAL THERMAL PROTECTION RELAY – EPU (ANSI 23/26/49)



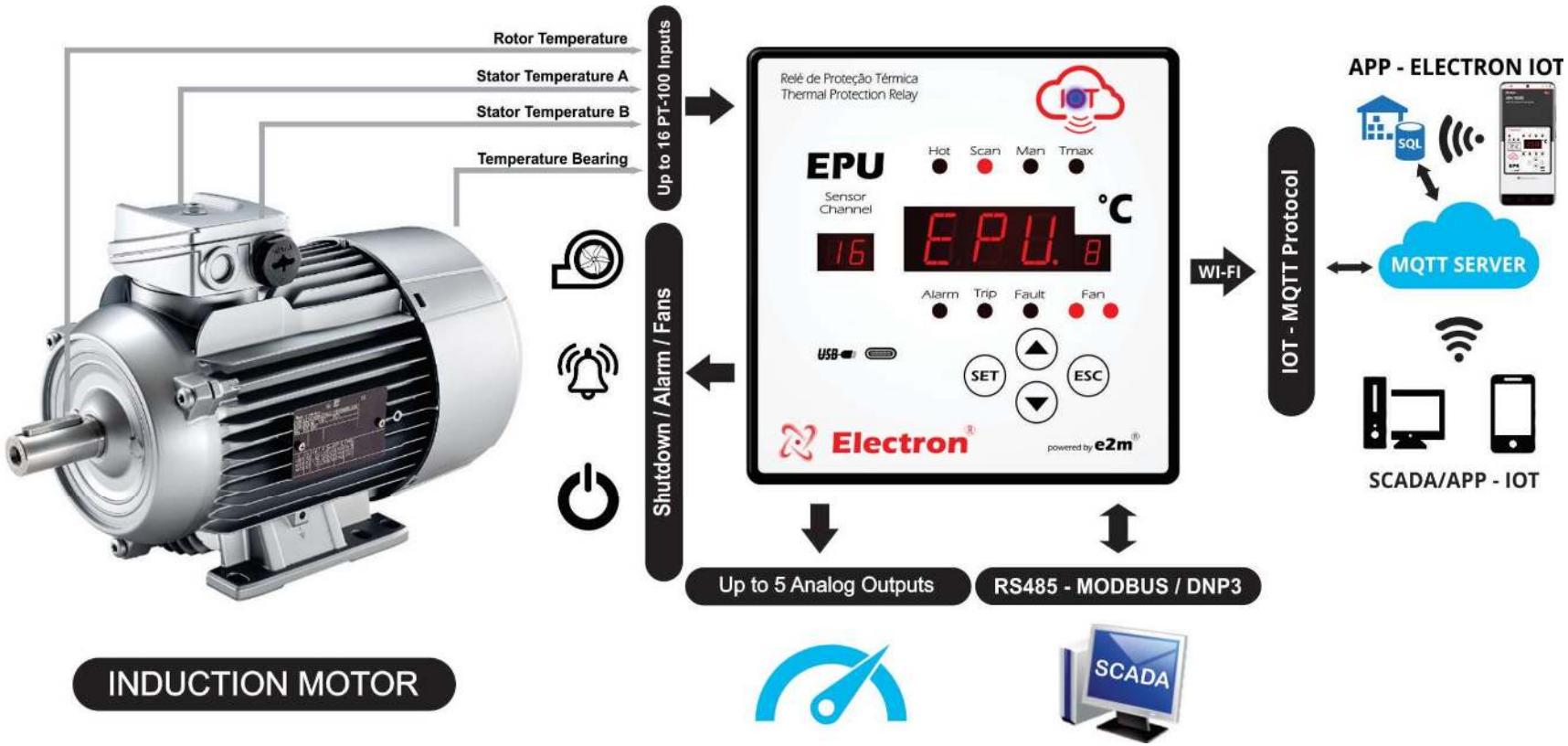
UNIVERSAL THERMAL PROTECTION RELAY – EPU (ANSI 23/26/49)



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UNIVERSAL THERMAL PROTECTION RELAY – EPU (ANSI 23/26/49)



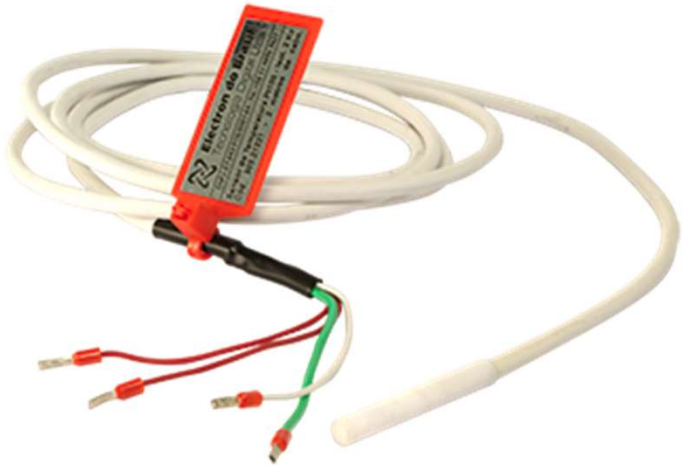
THERMAL RELAY – RT49



MAIN FEATURES:

- Thermal Protection Relay for transformers and motors
- According to ANSI 49
- Up to 4 PTC (DIN 44081/44082) in series for each of the 2 inputs
- Relay test system with no needs to elevate the temperature
- Connectors with pluggable system
- Continuous verification system for the integrigy of the sensors

PT100 SENSOR FOR DRY TRANSFORMER TEMPERATURE MEASURING



MAIN FEATURES:

- Meets the requirements of IEC, IEEE, DIN, and ABNT,
- Bulb in stainless steel AISI-304 or teflon,
- Cable insulation in PVC, silicone or teflon,



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