Electron

Remote Terminal Unit – RTU

Catalogue

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INTRODUCTION

The RTU Remote Terminal Unit (*Remote Terminal Unit*) of Electron do Brasil is a microprocessor equipment with high capacity for data acquisition, monitoring, indication, control and supervision. What makes it a robust, versatile, configurable solution with numerous application possibilities, due to its reliability and efficiency, RTU is an equipment intended for the most diverse sectors:

- **ENERGY**
  - Electrical Substations;
  - Hydroelectric Power Plants;
  - Solar Power Plants;
  - Wind Power Plants;
  - Green Hydrogen Plants (H2 Green);
  - Transformers and Power Transmission and Distribution;
  - Protection, Distribution and Control Panels;
- **OIL & GAS**
  - Fixed Oil Platforms;
  - Self-lifting;
  - Semi-submersible;
  - FPSO;
  - FPSO Mono column;
  - TLWP;
  - Drillship;
- **TRANSPORT**
  - Traffic Control;
  - Railroad Control;
  - Electric Trains and Trams;
- **CONSTRUCTION**
  - Smart Building Management (BMS);
  - Monitoring and Control of Escalators;
  - Monitoring and Control of Air Conditioning;
  - Monitoring and Control of Elevators;
  - Monitoring and Control of Lighting;
- **SANITATION**
  - Monitoring and Control of Reservoir Level;
  - Monitoring and Control of Pumps;
  - Monitoring and Control of Signals and Sensors;

RTU offers many advantages in its implementation. The download and use of its Software is free, didactic and easy to parameterize. The configuration of modules is completely free for the user to specify the product in a way that best suits their application. It can be configured to offer up to 5 communication ports for SCADA systems. The programming logic of this equipment is unlimited. Internet connection via MQTT Broker for access to statuses and parameters via web page or mobile application and pairing via Bluetooth.

The RTU is a modularly configurable equipment, that is, the number of modules must be specified to meet the application for which it is intended. The default configuration of the RTU Electron is:

- 1 Source Module (RTU-PW).
- 1 CPU Module (Rtu-CPU).
- 1 Communication Module (RTU-DCM) (Optional).
- And up to 8 modules for signal processing Inputs/Outputs (DI, DO, AI, AO, PT-100, NPN/PNP) and/or Dedicated Modules.

The Source Module, **RTU-PW,** has universal power with a range of 85 to 265 Vdc/Vac. It also has a relay output for Fault signaling (Watchdog) that will trigger when the RTU is not receiving reliable signal from some signal connected to one of its inputs or when the equipment is not receiving enough power to operate. It offers Auxiliary Power option through an output contact of 24 Vdc (2 Watts and 83 mA).

The CPU Module, **RTU-CPU**, has input for up to 2 serial ports RS-485 (ANSI / TIA / EIA-485-A) with a selection option between Modbus RTU and DNP 3.0 Level 2 communication protocols. It also offers the option of an input for optical fiber through ST type connectors that can be used to traffic the protocols integrated in it or to be used as communication between 2 Remotes (RTU) that form an isolator and transducer of signals, one RTU works in *Transmitter mode* and the other in *Receiver mode,* both can be

interconnected by a pair of **multimode optical fiber** for safe transmission for a distance between the RTU's of up to **3,000 meters**, in this way it is possible to make the acquisition on site of a clean signal and close to the generating source and transmit it remotely with high resolution and immunity to all kinds of signal, electrical noise and humidity, as well as free from being affected and/or damaged by lightning strikes. The **RTU-CPU** module has as an option a **micro SD card** slot (Datalogger) Class 10 (10mB/s) for data storage where all data can be stored and queried later with generation of graphs and spreadsheets for analysis and decision making. Contains a front Micro USB port for parameterization software communication, **Useeasy ™.**

The Data Communication Module, **RTU-DCM**, offers wireless internet connection, where all data and status of variables, inputs and outputs, can be sent to a database and managed by an MQTT Broker. In this way the user can access and consult the equipment whenever he wants and from wherever he is. The RTU contains the possibility of performing pairing via Bluetooth for communication and data query. The **RTU-DCM** module also offers the option of an RS-485 Slave or Master mode port. The RS-485 Master type port is developed according to the previously informed application requirements. In addition to offering a port for Ethernet TCP/IP for data communication via Ethernet. There is also an option for Micro SIM Card input, which enables remote monitoring through NBIoT network using MQTT protocol.

Signal Input and Output modules, or I/O modules, provide many possibilities for data acquisition, monitoring and control for various applications. Contains the standard modules for this product, which are Digital Input (**RTU-DI**), Digital Output (**RTU-DO**), Analog Input (**RTU-AI**) and Analog Output (**RTU-AO**), among others.... And we also have the option of dedicated modules, with more than one type of signal in the same module. Each RTU I/O Module contains up to 8 inputs or 8 outputs. Each module can be mounted from 1 to 8 slots, which adds up to 64 IO's. The order for selecting each I/O module per slot is fully configurable, that is, you can specify the product in the best way and according to your need. To see all the signals from the Remote's input and output modules, see 1, 2, 3 and 4.

The RTU is a compact equipment dimensions, built in extruded aluminum with electrostatic paint that protects the equipment against external chemical agents and the aluminum housing protects the electronic boards against noise and external disturbances in addition to being an excellent thermal sink that prolongs the life of the electronic components and fixation on DIN rail 35mm at the bottom of the panel.

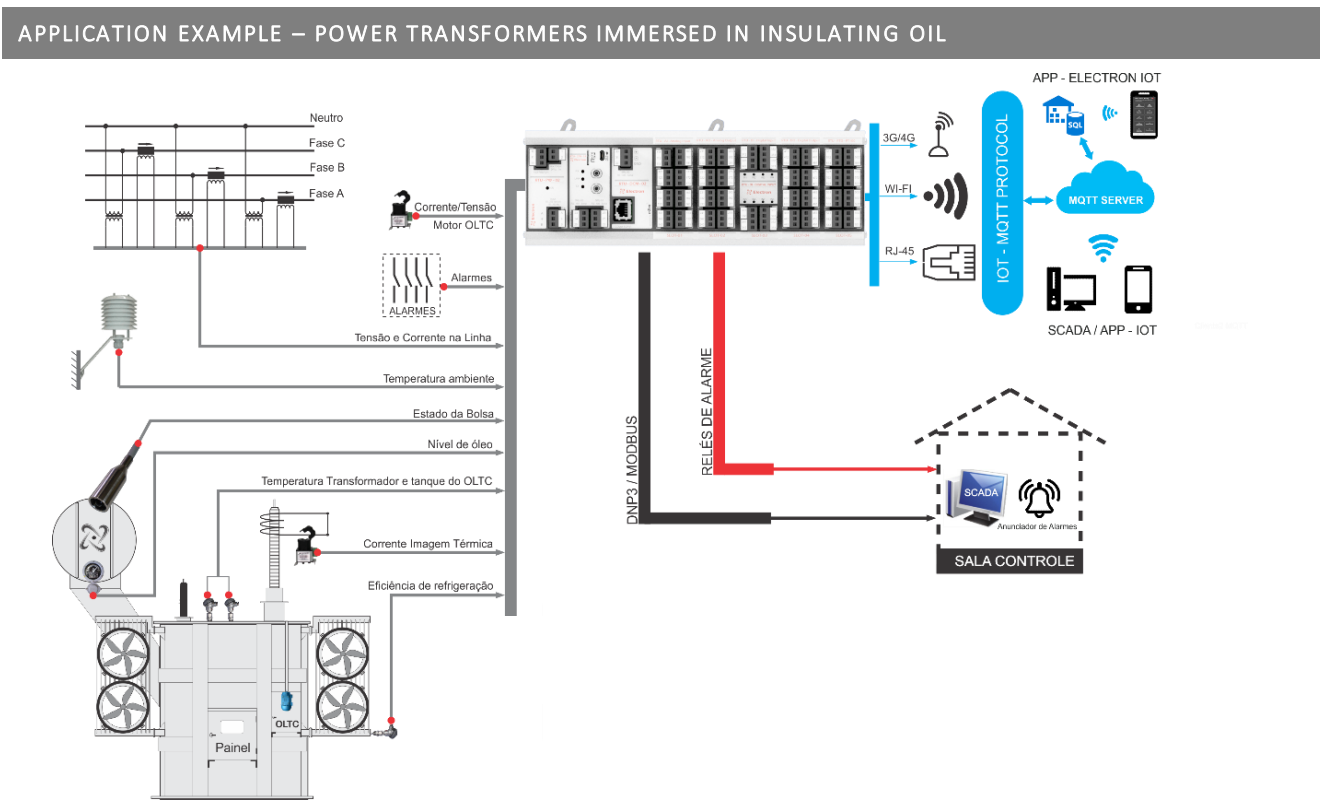## APPLICATION EXAMPLE – POWER TRANSFORMERS IMMERSED IN INSULATING OIL

Figure 1 - Monitoring of Power Transformer immersed in insulating liquid.

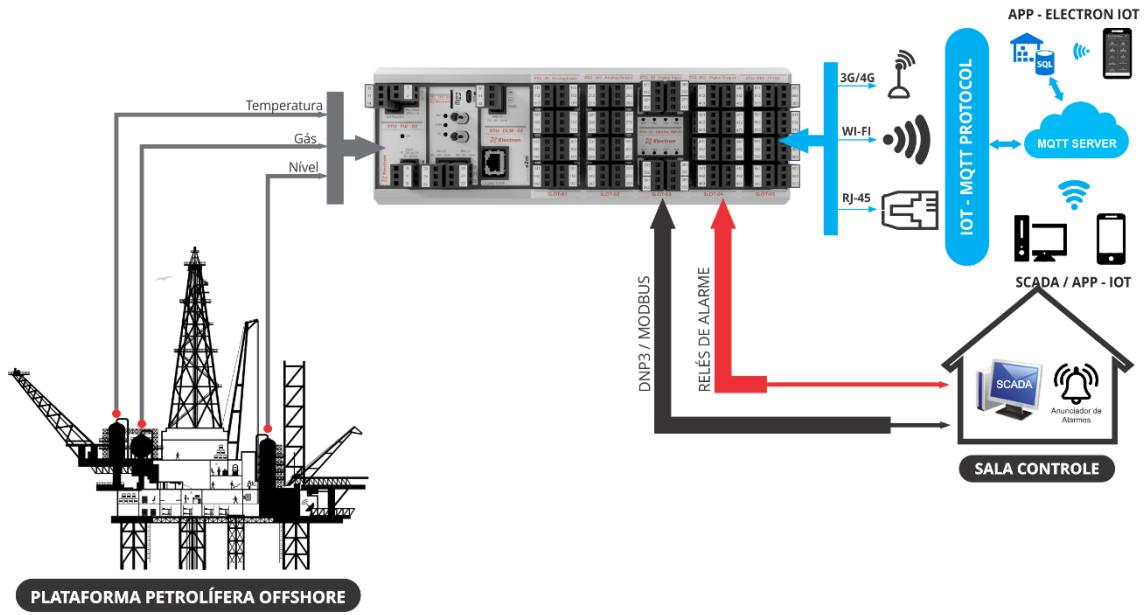## APPLICATION EXAMPLE – OFFSHORE OIL PLATFORM

Figure 2 - Monitoring and Protection in Off-Shore Oil Platforms

EXAMPLE APPLICATION – DATACENTER
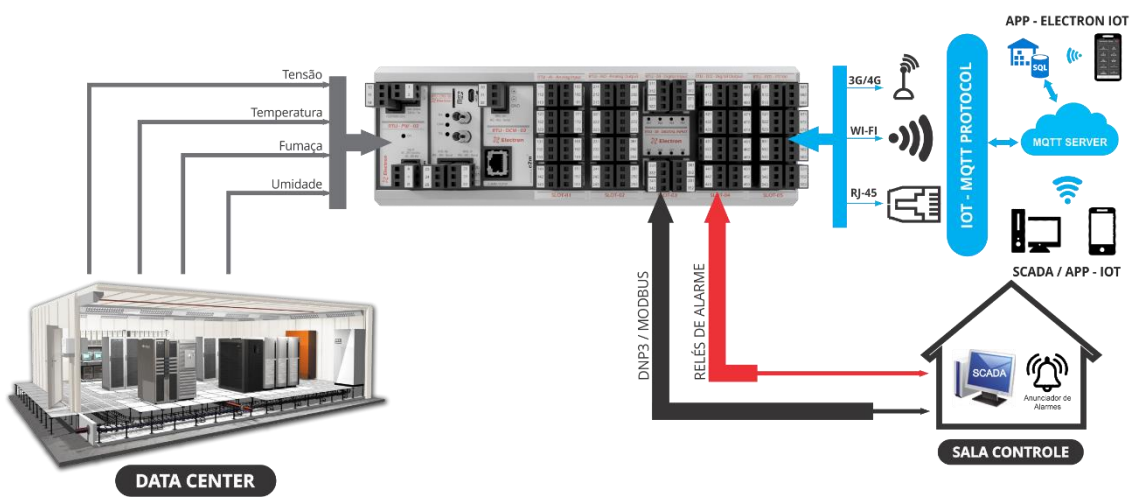

Figure 3 - Protection and monitoring of Data Centers.

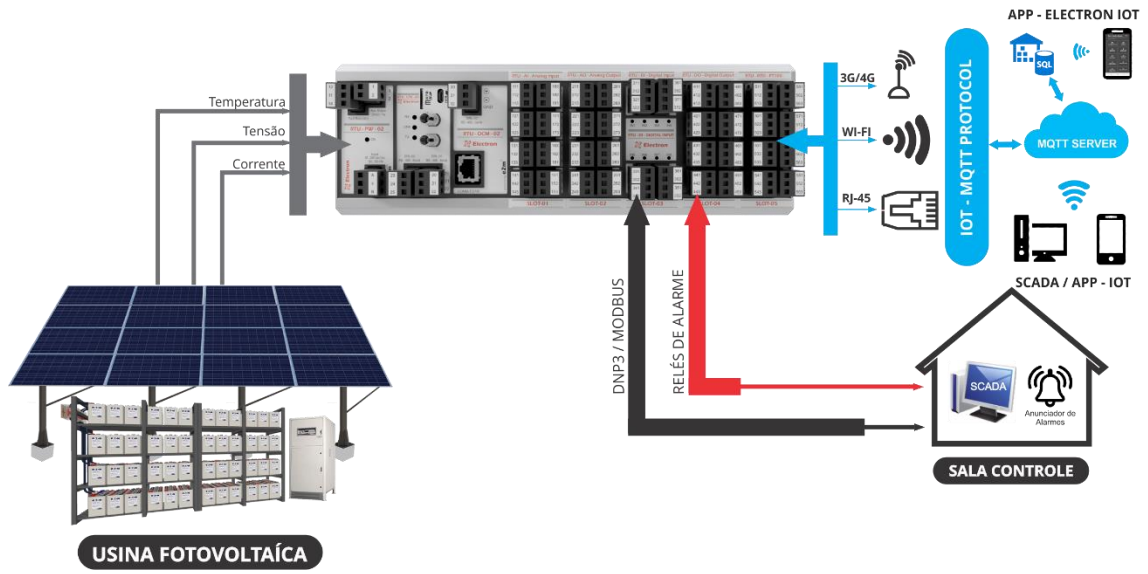## APPLICATION EXAMPLE – SOLAR POWER PLANT

Figure 4 – Solar Power Plant

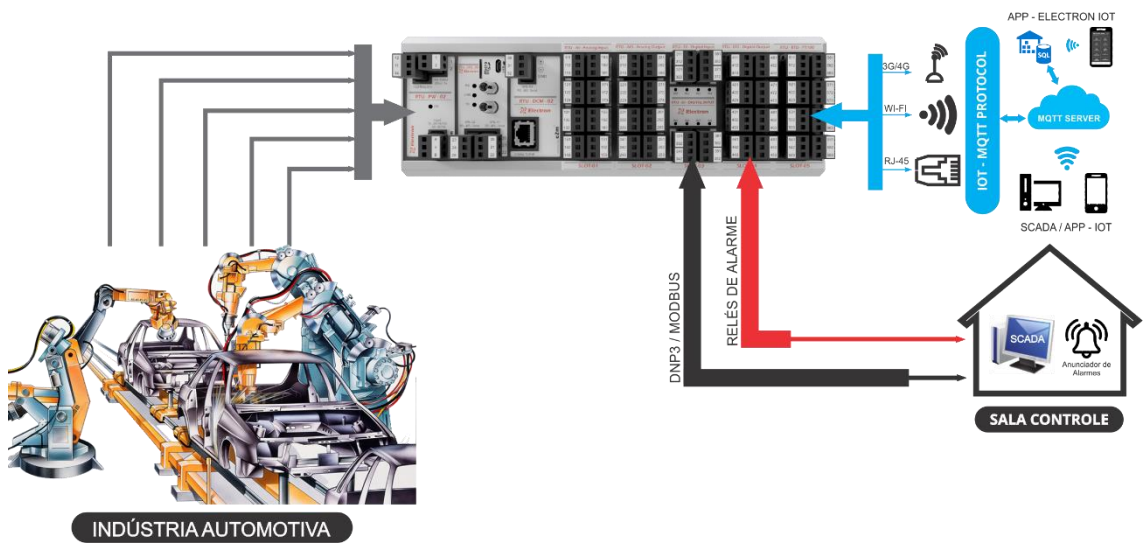## APPLICATION EXAMPLE – AUTOMOTIVE INDUSTRIES

Figure 5 – Industry Sectors

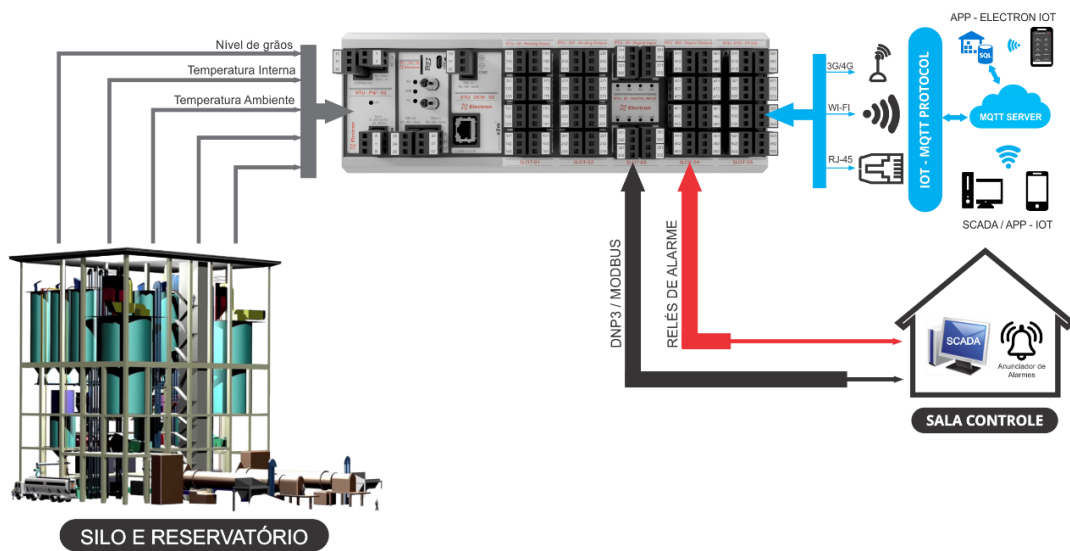## APPLICATION EXAMPLE – AGRICULTURAL SECTOR

Figure 6 – Agricultural Sector

SIGNAL PROCESSING – MAIN AND AUXILIARY MODÚLOS

The Remote is an equipment with high capacity for processing input and output signals. There are many application possibilities, given the volume of data that this equipment can concentrate, monitor, supervise, process and operate. The Tables below present the characteristics and description of each of these signs:

RTU – Main and Auxiliary Modules		
Abbreviation	**Function**	**Description**
PW	POWER SUPPLY	1 Input for universal power with range of 85...265 Vdc/Vac. With frequency range of 50/60 Hz.
	AUXILIARY POWER OUTPUT	1 auxiliary output contact that offers 24 Vdc (stabilized) of voltage, 83 mA of current and 2 Watts of power and insulation of 2 KV / 60 Hz / 1 minute.
	WATCHDOG	1 output to relay to indicate failure of reading of some sensor. This relay is dedicated to alerting you that the RTU is not receiving reliable signal at one of its inputs.
CPU	MULTIMODE FIBER INPUT	1 Input via ST connector for conversion of RS-485 signal (2 wires, metallic twisted pair) to optical fiber. Recommended for use in electric power substations, marine platforms and environments with high noise index, inductions and electromagnetic disturbances.
	RS-485 SERIAL (SLAVE)	Up to 2 RS-485 digital inputs (ANSI/TIA/EIA-485-A) with Modbus RTU, Modbus TCP and DNP3 level 2 serial communication protocol selection option for remote access of all monitored parameters and variables.
	MICRO-USB INPUT	1 USB input for communication with the free use UseEasyTM Parameterization Software.
	MICRO SD CARD INPUT	1 Input for Micro SD **Card Class 10 (10mB/s)**. The log write is performed as a function of the time and the variation of the measured quantity and the variables that will be selected for recording are configurable.

DCM	WIRELESS INTERNET COMMUNICATION	Protocols: Modbus TCP – WIFI; Modbus RTU – WIFI and MQTT for IOT monitoring.
	RS-485 SERIAL (SLAVE OR DEDICATED MASTER)	1 RS-485 digital input (ANSI/TIA/EIA-485-A) with Modbus RTU, Modbus TCP and DNP3 level 2 serial communication protocol selection option for remote acquisition of all monitored parameters and variables. **IMPORTANT:** To use this master input, Electron do Brasil must be consulted and informed about the details of the desired application.
	SIM CARD INPUT	1 SIM Card Slot - NBIoT (4G/5G), for remote monitoring via IoT using SCADA systems based on MQTT protocol.
	RJ-45 INPUT	1 RJ-45 connector input for communication via Ethernet TCP/IP with Modbus TCP protocols; Modbus RTU and MQTT for remote access of all monitored parameters and variables.

Table 1 – Main and Auxiliary Modules.

SIGNAL PROCESSING – INPUT MODÚLOS (INPUTS)

RTU – Input Modules		
Abbreviation	**Function**	**Description**
.AI	ISOLATED ANALOG INPUT	8 Isolated Analog Inputs of 0...24 Vdc and 0...20 mA.
DI	ISOLATED DIGITAL INPUT	8 isolated digital inputs 12...300 Vdc/Vac.
NIP	PNP AND NPN INPUT	8 active PNP/NPN inputs 0...24Vdc/5mA per channel.
RTD	PT-100 RTD INPUT	8 RTD PT-100 resistive signal inputs (-50...850 °C).
DPT	DIGITAL INPUT / PT-100 RTD INPUT	4 isolated digital inputs 12...300 Vdc/Vac.
		4 RTD PT-100 resistive signal inputs (-50...850 °C).
APT	ANALOG INPUT / PT-100 RTD INPUT	4 Isolated Analog Inputs of 0...24 Vdc and 0...20 mA,
		4 RTD PT-100 resistive signal inputs (-50...850 °C).
DPN	DIGITAL INPUT / PT-100 INPUT / LEVEL INPUT	4 isolated Digital Inputs 12...300 Vdc/Vac.
		2 RTD PT-100 resistive signal inputs.
		2 Resistive inputs 0...400 Ohms.

Table 2 – RTU input modules .

SIGNAL PROCESSING – OUTPUT MODÚLOS (OUTPUTS)

RTU – Output Modules		
Abbreviation	**Function**	**Description**
TO	ANALOG OUTPUT	8 Isolated Analog Outputs of 0...24 Vdc and 0...20 mA.
OF	DIGITAL OUTPUT	8 Digital Outputs to SPDT Relay (NAF) with 6 A.

Table 3 – Output modules.

SIGNAL PROCESSING – DEDICATED MODULES FOR INPUTS (INPUTS/OUTPUTS)

	RTU – Dedicated Modules for Transformers (Inputs/Outputs)	
Abbreviation	**Function**	**Description**
RBM	BAG AND MEMBRANE RELAY	1 Liquid sensor input (SLE) dedicated application detection of bag rupture and or transformer membrane, or leaks.
MTTP	TEMPERATURE MONITORING (ANSI 23, 26, 49/49I)	4 Inputs for resistive signal reading of RTD PT-100 type sensors.
		4 Inputs with a range of 4...20 mA of Split-Core TC for current signal reading.
DVR	VOLTAGE REGULATOR (ANSI 90)	4 Inputs for reading voltage from 0 to 280 Vac (3 phases and neutral).
		3 Inputs for Split-Core CT of 0-10Aac for reading of Phase Current.
MNO	LEVEL MONITOR(ANSI 71/71C)	1 Resistive signal input (Magnetic buoy) with a range of 0...400 Ohms for oil level reading of the Transformer Conservator.
		1 Resistive signal input (Magnetic buoy) with a range of 0...400 Ohms for oil level reading of the Switch tank under load of the Transformer.
OLTC-01	UNDER-LOAD COMMUTATOR MOTOR TRANSDUCER	1 Input for voltage reading up to 350 Vac (between phases) + 1 Input with a range of 4...20 mA of Split-Core TC for reading 1-phase AC current signal from the Switch Motor Under Load.
OLTC-02	UNDER-LOAD COMMUTATOR MOTOR TRANSDUCER	1 Input for voltage reading up to 350 Vdc (between phases) + 1 Input with internal resistor of the Shunt type for direct reading of AC current signal.

Table 4 – Dedicated modules (Inputs/Outputs) for transformers

SOURCE MODULE - PW

Each module Source **RTU-PW-00 and PW-01** occupy 01 SLOT space and the **RTU-PW-00** occupies 02 SLOT spaces, and only 01 module can be mounted in each Remote. Every RTU-PW module of Remota contains the following characteristics:

- The **Auxiliary Output** is commonly used to power analog transducers and sensors. Auxiliary Output is optional and must be appended to this module during order request code generation.
- The **Power Input** and the **Fault Relay** must be part of the RTU-PW module of the Remote.
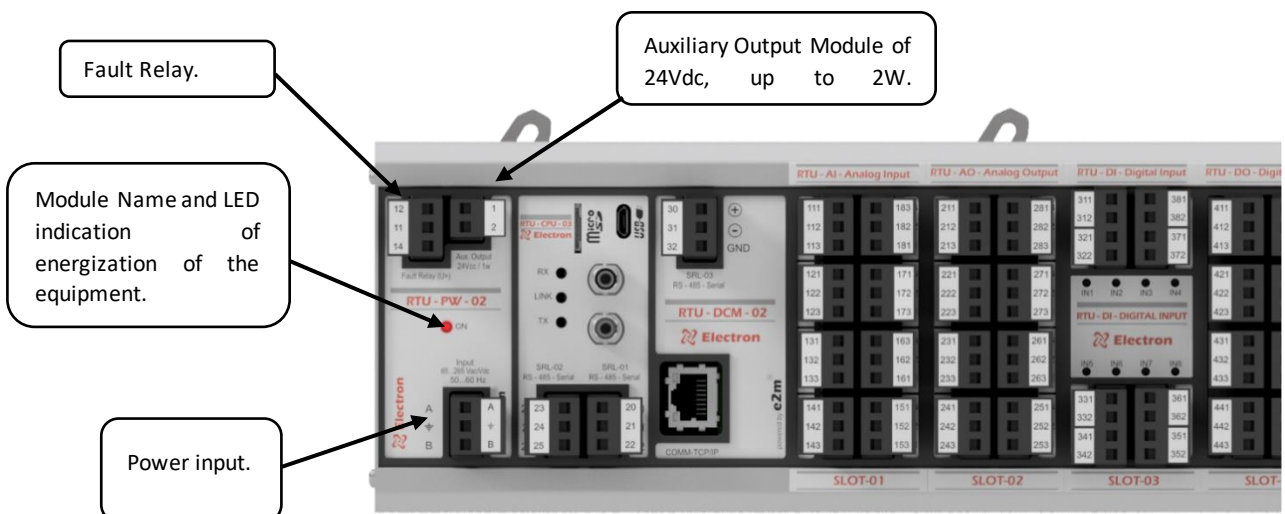

Figure 7 - Illustration of the RTU-PW Source Module

Technical Data Input Power	
Operating Voltage Range	85 to 265 Vdc/Vac
Operating Frequency Range	50 to 60 Hz
Operating Temperature Range	-40 to 85 °C
Power Consumption	15 W (PW-00 AND PW-01) / 30 W (PW-02)

Auxiliary Output Technical Data (Optional)	
Output Voltage	24 Vdc – stabilized
Max. current Drained	83 mA
Max. power Provided	2 W
Galvanic Isolation	2 kV / 60Hz / 1 minute

Fault Relay Technical Data	
Contact Capacity / (Resistive Load)	125 VAC / 15 A, 250 VAC / 10 A, 24 VDC / 15 A
Maximum switching current	6 Amps
Minimum switching current	500 mW/12 V/10 mA
Maximum Switching Power	1500 VA – 180 W
Maximum switching voltage	400 VAC / 125 VDC
Mechanical life	10^6 operations minimum 300 cycles (operations/minute);
NA uptime	8 ms (max.)
Downtime	4 ms (max.)
Dielectric stiffness between coil and contacts	4000 VAC (RMS)
Dielectric stiffness between open contacts	1000 VAC (RMS)
Initial insulation resistance	1000MΩ (500 VCC)
Vibration resistance	10~55 Hz (dual amplitude 1, 1 mm/6G)

Table 5 – Technical data of the source module.

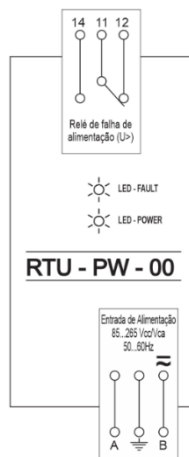## SOURCE MODULE CONNECTION DIAGRAMS – PW

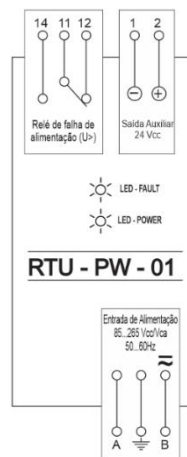Figure 8 – PW-00 Source Module, without auxiliary output.

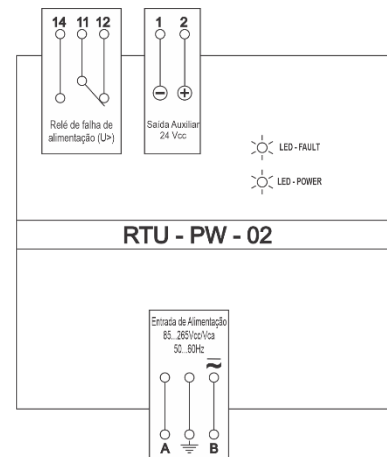Figure 9 – PW-01 Source Module, with auxiliary output.

Figure 10 – PW-02 Source Module, with auxiliary output.

PROCESSING MODULE – CPU

Each **RTU-CPU module** occupies 01 SLOT space, and only 01 module can be mounted in each Remote and contains the following characteristics:

- **The Micro-USB Input** must integrate the RTU-CPU module of the Remote for configuration via software.
- **The Input for Micro SD Card** to record and store the monitored data on Micro SD Card **Class 10 (10mB/s),** the Variables can be selected for recording and the logging is performed as a function of time and the variation of the measured quantity (optional).
- **Up to two RS-485 communication ports** (ANSI/TIA/EIA-485-A) with the possibility of configuring different slave protocols in each output, this module had a mandatory RS485 communication port, being optional the second port.
- **Multimode Fiber (ST) communication port** is optional and must be added to this module during order request code generation. Resistant to EMI/RFI and current oscillations, ideal for close data communications of Transformers, heavy electrical equipment and other electrical or radio interference.
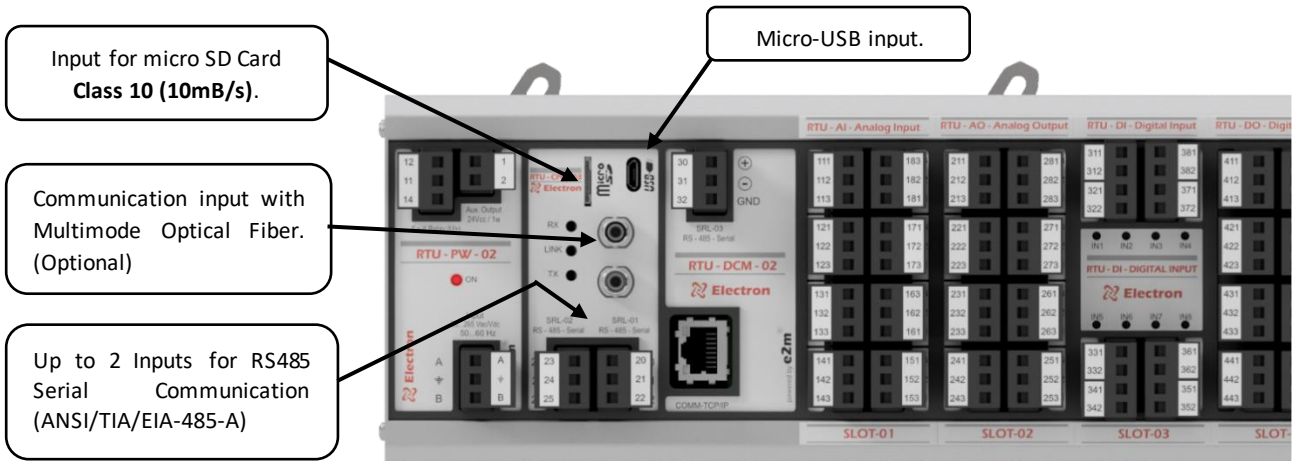
Input for micro SD Card **Class 10 (10mB/s)**.

Micro-USB input.

Communication input with Multimode Optical Fiber. (Optional)

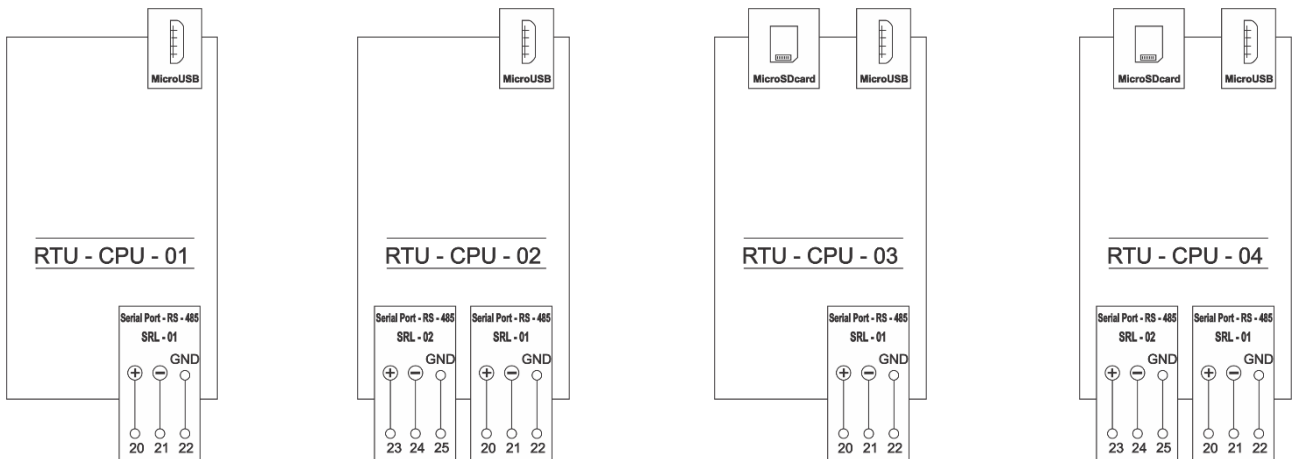Up to 2 Inputs for RS485 Serial Communication (ANSI/TIA/EIA-485-A)

Figure 11 - CPU Module Illustration

DIAGRAMS OF PROCESSING MODULE CONNECTIONS – CPU
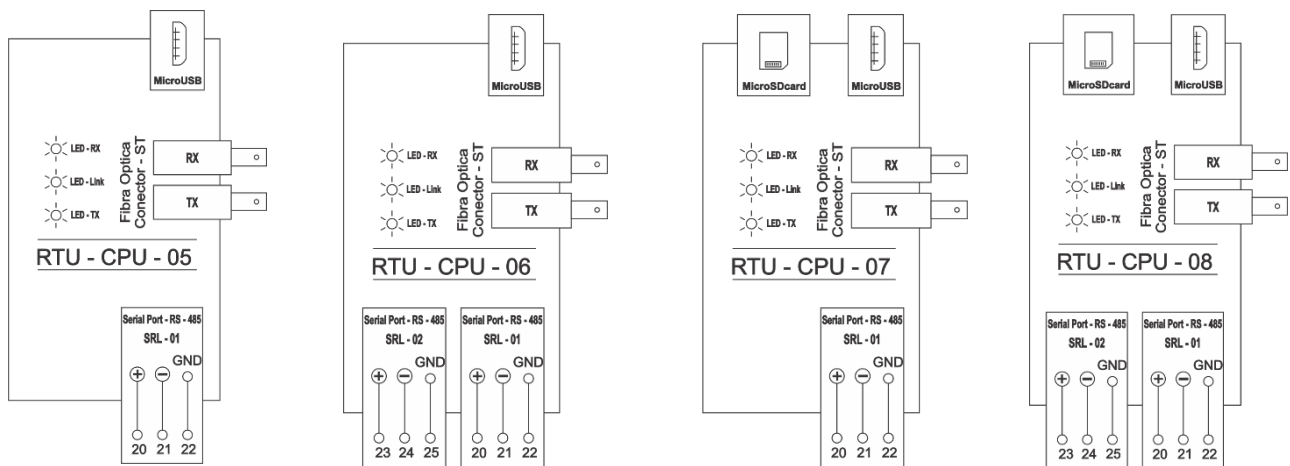
Figure 12 – CPU Modules

Technical data of the RS-485 Serial Communication Module	
Transmission mode	Half-Duplex (two wires)
Maximum length of communication cables	1200 meters
Communication Speed	Auto Baud Rate 2,400 to 57,600 bps (Automatically detects communication network speed)
Maximum number of devices on the network	32 units
Isolation	2 kV / 60Hz / 1 minute

Technical data of the Communication Module with (Optical Fiber)	
Maximum fiber length	3000 m (multimode optical fiber, 62.5/125 µm)
Fiber connector	ST Standard
Minimum transmission power	-14.0 dB.m (multimode optical fiber, 62.5/125 µm)
Maximum transmission power	-10.0 dB.m (multimode optical fiber, 62.5/125 µm)
Minimum reception sensitivity	-24 dB.m (multimode optical fiber, 62.5/125 µm)
Compatible with multimode fiber optics	50/125 µm, 62.5/125 µm, 100/140 µm e 200 µm
Wavelength	850 hm

Table 6 – CPU Technical Data

NOTE: We have a technical article on our website on serial communication via RS-485, available for download at the address of the company's website at the following link Artigo_RS485.

DATA COMMUNICATION MODULE - DCM

Each Communication module is optional and RTU-DCM occupies 01 SLOT space, and only 01 module can be mounted in each Remote. The Remote RTU-DCM Module contains the following features:

- WIFI (Modbus TCP and RTU / DNP3 / MQTT);
- Bluetooth for parameterization via Mobile APP and Virtual HMI;
- Input for TCP/IP Communication (Modbus TCP and RTU / DNP3 / MQTT);
- RS-485 Serial Input (Slave or Dedicated Master);
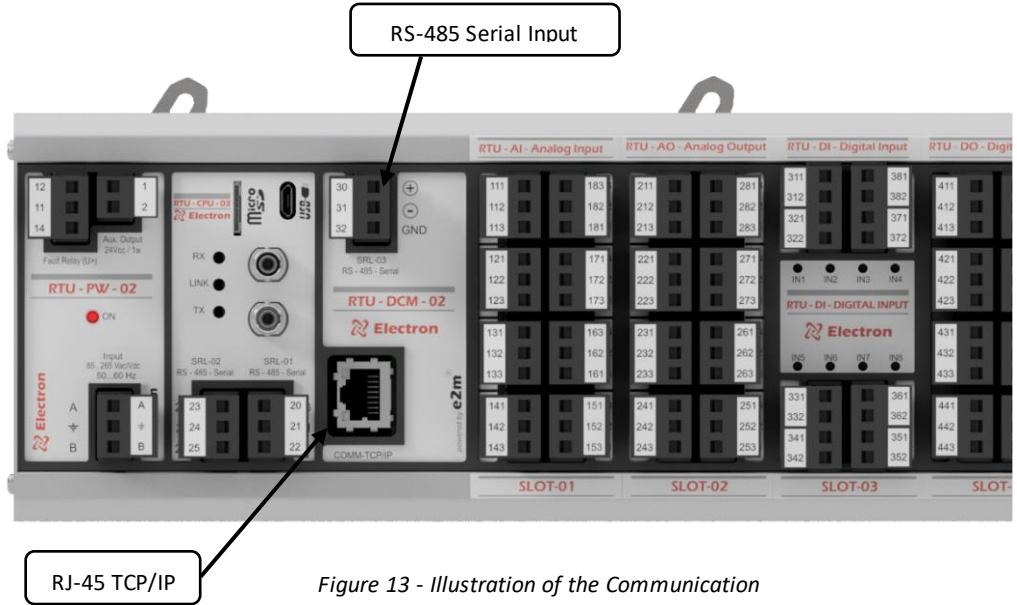- SIM Card (NBIoT) input for access to IoT monitoring;

Figure 13 - Illustration of the Communication Module

DIAGRAMS OF PROCESSING MODULE CONNECTIONS – DCM
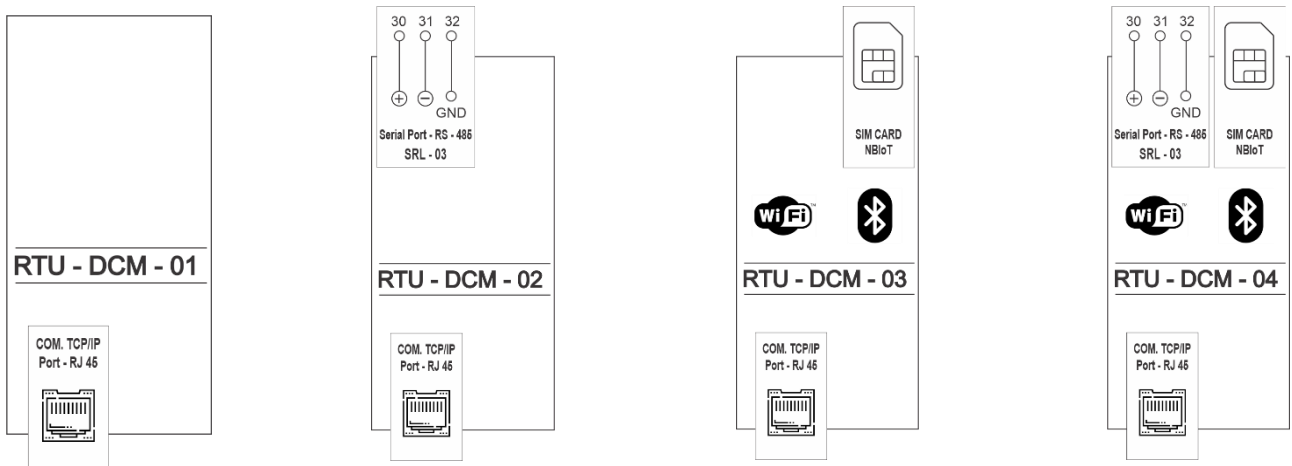
Figure 14 - Communication Module Diagram

Configuration of Communication Protocols and Ports									
Model	Modbus RTU	Modbus TCP/IP	DNP3	MQTT	SERIAL RS485	RJ45 PORT	SIM CARD NBIoT	WIFI	BLUETOOTH

DCM-01	✓	✓	✓		✓				
DCM-02	✓	✓	✓		✓	✓			
DCM-03	✓	✓	✓	✓		✓	✓	✓	✓
DCM-04	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 7 – DCM Configuration Table

| Bluetooth BLE Module Technical Data	
Version	4.2
Frequency	2402 MHz to 2480 MHz

Technical Data of the TCP/IP Communication Module via RJ-45	
Loss of Return	-18dB minimum @ 1-30MHz-16dB minimum @ 30-60MHz-12dB minimum @ 60-90MHz
Common mode bounce rate	-30dB Minimum @ 1-100MHz
Isolation	2 kV / 60Hz / 1 minute

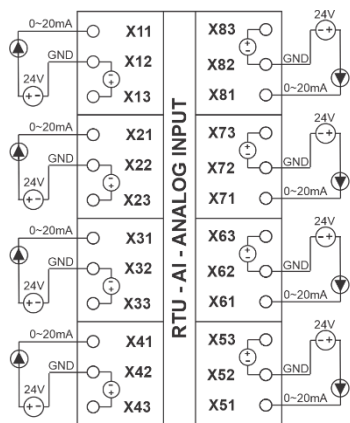| WIFI Module Technical Data	
Standards	802.11 b/g/n/e/i
Security Protocols	WPA/WPA2/WPA-Enterprise
Data rate	Up to 150 Mbps
Transmission Power	Up to 21 dBm
Frame Encapsulation	802.11h/RFC 1042
Automatic Beacon	Monitoring/Scanning

Table 8 - Technical Data of the Communication Module
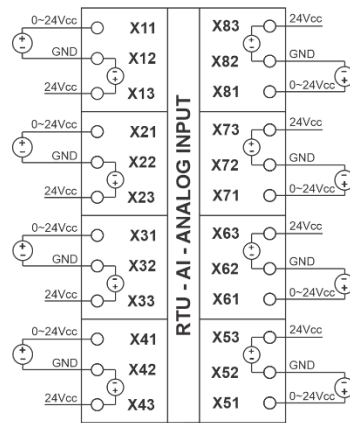
ANALOG INPUT MODULE - AI

Each Analog Input Module reads direct voltage (Vdc) and direct current (mA) signals, and occupies 01 Remote SLOT space and up to **8 modules can be mounted** on each equipment that corresponds to **64 inputs**;
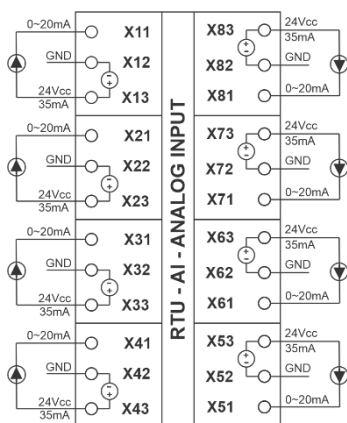
Letra X = nº SLOT de instalação do módulo
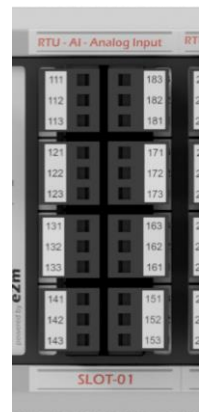
Figure 15 – Schematic - AI - 0-20mA

Letra X = nº SLOT de instalação do módulo

Figure 16 – Schematic – AI 0-20mA – with External Source

Letra X = nº SLOT de instalação do módulo

Figure 17 – Schematic – AI - 0-24Vdc

Figure 18 - Illustration

Technical data of the Analog Input Module	
Module Auxiliary Voltage	24 Vdc and 35mA (max.) per input
Resolution	16-bit
Maximum analog input error	0.1% end of scale

Current reading range	0 to 20 mA;
Continuous voltage reading range	0 to 24 Vdc
Isolation	2 kV / 60Hz / 1 minute

Table 9 - Technical Data of the Voltage and Direct Current Input Module

RELAY DIGITAL OUTPUT MODULE – DO

Each input module of Digital Output NAF occupies 01 space of SLOT of the Remote, being able to be mounted up to **8 modules** in each equipment that corresponds to **64 inputs**;

To use **above 2** digital output modules (relays) the **PW-02 power supply is required**.
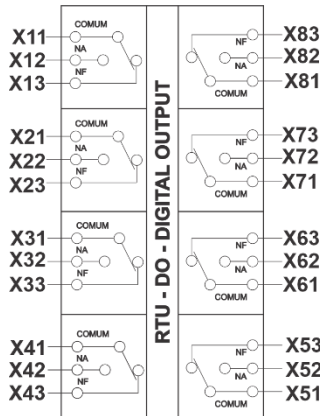
Letra X = nº SLOT de instalação do módulo

Figure 19 - Diagram of connecting digital outputs to SPDT NAF Relay

Figure 20 - Illustration of digital outputs module to SPDT NAF Relay

Technical data of the NAF Digital Output Module	
Contact Capacity / (Resistive Load)	125 VAC / 15 A, 250 VAC / 10 A, 24 VDC / 15 A
Maximum switching current	6 Amps
Minimum switching current	500mW/12V/10mA
Maximum Switching Power	1500VA – 180W
Maximum switching voltage	400 VAC / 125VDC
Mechanical life	10^6 operations minimum 300 cycles (operations/minute);
NA uptime	8ms (max.)
Downtime	4ms (max.)
Dielectric stiffness between coil and contacts	4000 VAC (RMS)
Dielectric stiffness between open contacts	1000 VAC (RMS)
Initial insulation resistance	1000MΩ (500 VCC)
Vibration resistance	10~55Hz (dual amplitude 1, 1mm/6G)

Table 10 - Technical Data of the NAF Relay Digital Output Module

ANALOG OUTPUT MODULE - AO

Each Analog Output Module occupies 01 SLOT space, and up to 8 modules can be mounted in each REMOTE that corresponds to **64 inputs**;

Letra X = nº SLOT de instalação do módulo

Figure 21 - Output Diagram - Active
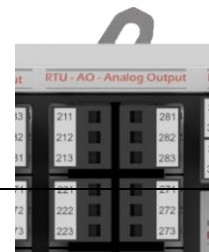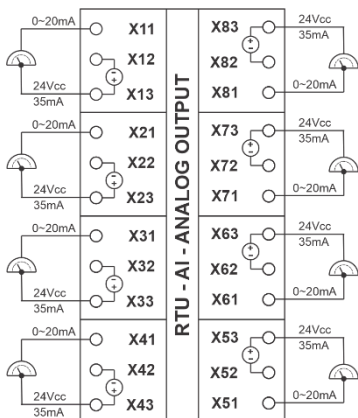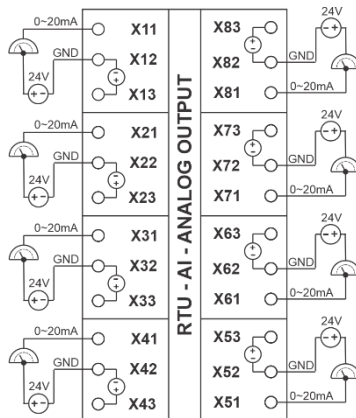
Letra X = nº SLOT de instalação do módulo

Figure 22 - Output Diagram - Passive

Figure 23 - Analog Output Illustration

Technical data of the Analog Output Module	
Module Auxiliary Voltage	24 Vdc and 35mA (max.) per input
Resolution	12-bit
Maximum analog output error	0.1% end of scale
Current Output	0 - 20 mA
Maximum Load for the selected range	0 - 1mA = 20 KΩ
	0 - 5mA = 4 KΩ
	0 - 10mA = 2 KΩ
	0 - 20mA = 1 KΩ
	4 - 20mA = 1 KΩ
Isolation	2 kV / 60Hz / 1 minute

Table 11 - Technical Data of the Analog Output Module

TEMPERATURE READING MODULE – RTD – PT100

Each RTD input module has 8 inputs for PT-100 and occupies 01 SLOT space, and can be mounted up to 8 modules in each REMOTE that corresponds to **64 inputs**;
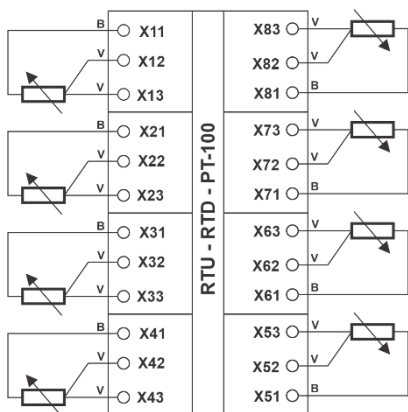
Letra X = nº SLOT de instalação do módulo

Figure 24 - PT100 RTD Connection Diagram

Figure 25 - Module Illustration - RTD PT100

	15-bit
Temperature Reading Range	-50 to 850°C
Nominal temperature resolution	0.031°C

Fault detection	RTD open and RTD in short
Cable resistance	0 a 30 ohms
Isolation	2 kV / 60Hz / 1 minute

Table 12 - Technical Data of RTD PT100 Temperature Sensor Input

DIGITAL INPUT MODULE - DI

Each module of Digital Input and occupies 01 space of SLOT of the Remote, being able to be mounted up **to 8 modules** in each equipment that corresponds to **64 inputs**;
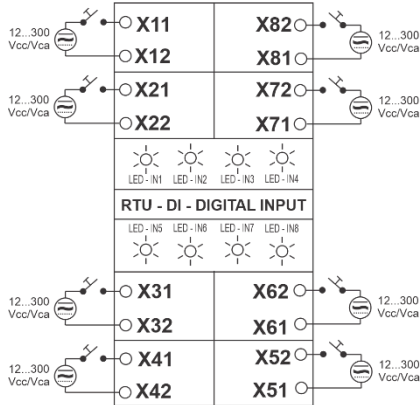
Letra X = nº SLOT de instalação do módulo
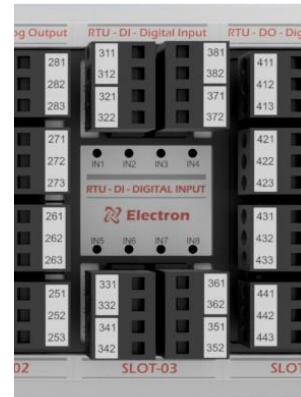
Figure 26 – Digital Input (DI) Connection Diagram

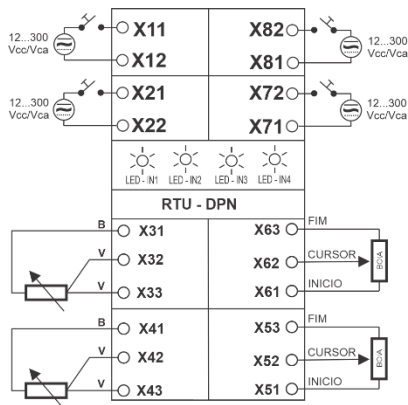

Figure 27 - Digital Input (DI) Illustration

Digital Input (DI) Technical Data	
Input Type	Sink / Source
Inputs and Sensitivity Range	8 isolated digital inputs 12...300 Vdc/Vac.
Constructive Features	Independent and Galvanically Isolated
Minimum time to pulse detection	500 mS
Response Time	500 mS
Frequency Range for Pulse Counting	100 Hz ~ 10 KHz
Galvanic Isolation	2KV / 60Hz / 1 minute

Table 13 – Table of technical data of digital input

DIGITAL INPUT MODULE / PT-100 INPUT / LEVEL READING - DPN

Each Module occupies 01 SLOT space, and can be mounted up to 8 modules in each REMOTE that corresponds to **64 inputs**;

Letra X = nº SLOT de instalação do módulo
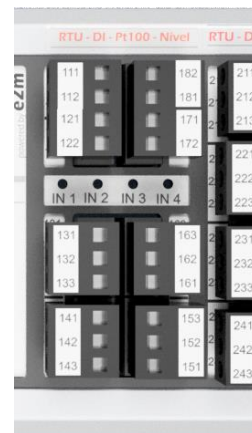
Figure 28 – Connection Diagram - DPN

Figure 29 – Illustration Module - DPN

Digital Input (DI) Technical Data	
Input Type	Sink / Source
Inputs and Sensitivity Range	4 isolated digital inputs 12...300 Vdc/Vac.

| Constructive Features	Independent and Galvanically Isolated
Minimum time to pulse detection	500 mS
Response Time	500 mS
Frequency Range for Pulse Counting	100 Hz ~ 10 KHz
Galvanic Isolation	2KV / 60Hz / 1 minute

Technical Data Input module for temperature sensor RTD PT100	
Resolution	15-bit
Nominal temperature resolution	0.031°C
Fault detection	RTD open and RTD in short
Cable resistance	0 a 30 ohms
Isolation	2 kV / 60Hz / 1 minute

Technical Data Oil Level Module	
Resistive input signal reading range	0 to 400 ohms (Magnetic buoy)
Level measuring range	0 to 100%

Table 14 – Technical data of the RTU module – DPN – Digital Input – PT100 – Level.

RBM DEDICATED MODULE – BAG AND MEMBRANE RELAY

The RTU-RBM Module occupies 01 SLOT space and has a 3-wire input for Liquid Detection Sensor (SLE), two Relays for Alarm activation by insulating oil infiltration inside the bag and an alarm to indicate failure in the liquid sensor.
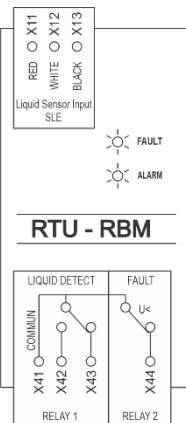
Figure 30 – Connection Diagram - RBM
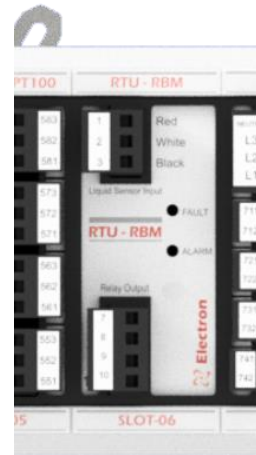
Figure 31 – Illustration Module - RBM

Technical Data RTU-RBMI	
Sensor Input	SLE
Switching Operating Temperature	-40 to + 85°C
Maximum Switching Capacity	70W/250VA
Maximum Driving Current	6 Amps
Outbound Contact	1NAF and 1NF

Technical Data – SLE	
Sensor Type	Transistor Photo
Dimension	Ø 14x70mm / M16x70mm

Material	Stainless Steel AISI-304
Sensor Operating Temperature	50 µS
Degree of Protection	IP67
Response Time	0 to 5 bar
Cape	3 x 18 AWG with grounding mesh

Technical Data – CPC	
Material	Injected aluminium
Recommended Torque	46 Nm
Degree of Protection	IP65
Connecting Head	4 wires

Table 15 – Table of technical data of RBMI.

GENERAL TECHNICAL DATA

REMOTE - RTU	
Operating Voltage Range	85 to 265 Vdc / Vac 50/60 Hz
Operating Temperature Range	-40°C to +85°C
Power Consumption	< 15 W
Maximum number of entries	64
Box Dimensions (DIN Standard) IEC 61554	According to Table 17 (Dimensions)
Hardware Package	Aluminium
Fixation	DIN standard for 35 mm rail
Protection	IP40 (Front), IP 20 (Connectors)

Table 16 – General technical data RTU

TYPE TESTS ATTENDED

- Applied Voltage **(IEC 60255-5)**: 2kV / 60Hz / 1 min. (against land);
- Voltage Impulse **(IEC 60255-5)**: 1.2/50 µ sec. / 5kV / 3 neg. and 3 pos. / 5 secs. Interval;
- Electrostatic Discharges **(IEC 60255-22-2)**: Air mode = 8kV / Counted mode = 6 kV;
- Immunity to irradiated electromagnetic disturbance **(IEC61000-4-3)**: 80 to 1000 MHz / 10V/m;
- Immunity to Fast Electrical Transients **(IEC60255-22-4)**: Alim/Entr./Outputs=4Kv/common 2Kv;
- Surge Immunity (**IEC60255-22-5)**: phase/neutral 1Kv, 5 per polar (±) - phase-earth/neutral-earth 2Kv, 5 per polar (±);
- Immunity to Conducted Electromagnetic Disturbances **(IEC61000-4-6):** 0.15 to 80 MHz / 10V/m;
- Climate Test **(IEC60068-21-14):- 40ºC** + 85ºC / 72 hours;
- Vibration Resistance **(IEC60255-21-1):** 3 axes / 10 to 150Hz / 2G / 160min/axis;
- Vibration Response **(IEC60255-21-1):** 3 axes / 0.075mm-10 to 58 Hz / 1G from 58 to 150 Hz / 8min/axis;
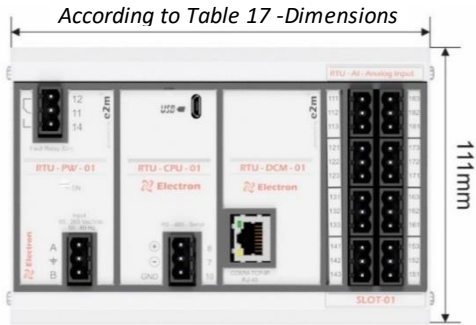
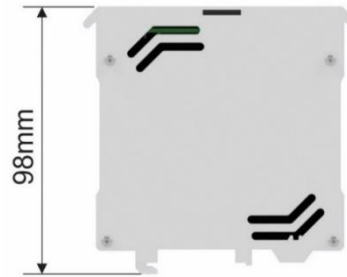## DIMENSIONS

Figure 32 – Remote Front View

Figure 33 – Left Side View of the Remote

SIZING TABLE								
CORE MODULES	1 SLOT	2 SLOTS	3 SLOTS	4 SLOTS	5 SLOTS	6 SLOTS	7 SLOTS	8 SLOTS
PW-00/PW-01 + CPU	114,5 mm	152,0 mm	189,5 mm	227,0 mm	264,5 mm	302,0 mm	339,5 mm	377,0 mm
PW-00/PW-01 + CPU + DCM	152,0 mm	189,5 mm	227,0 mm	264,5 mm	302,0 mm	339,5 mm	377,0 mm	414,5 mm
PW-02 + CPU	152,0 mm	189,5 mm	227,0 mm	264,5 mm	302,0 mm	339,5 mm	377,0 mm	414,5 mm
PW-02 + CPU + DCM	----------	----------	264,5 mm	302,0 mm	339,5 mm	377,0 mm	414,5 mm	452,0 mm

Table 17 - Dimensions

SENSORS FOR APPLICATION WITH RTU

Figure 34 – RTD PT-100 Temperature Sensor with head for level adjustment

Figure 35 – RTD PT-100 Temperature Sensor No head and bucim for level adjustment

Figure 36 – PT-100 Flexible Temperature Sensor

Figure 37 – Magnetic buoy of level indication.

Figure 38 – Pressure sensor

Figure 39 – 4...20mA Split core/Clamp type CT

Figure 40 – Inductive and capacitive sensors PNP or NPN
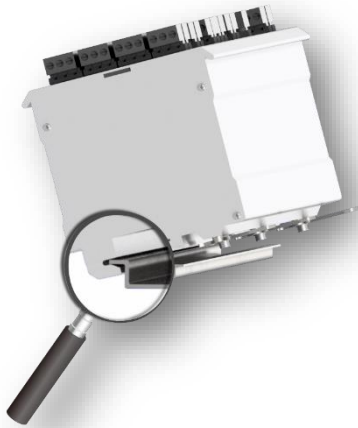

Figure 41 – Disc Rupture Sensor

Figure 42 – SLE Liquid Detection Sensor.

INSTRUCTIONS FOR FIXING

The Remote was developed to be fixed on DIN rail 35mm, correctly follow the instructions illustrated below to use it in your application:

Step One - Make sure the latches are not obstructing the DIN rail docking location

Step Two – Allocate this end of the DIN rail at one of the bases of the Remote as illustrated in the figure above.
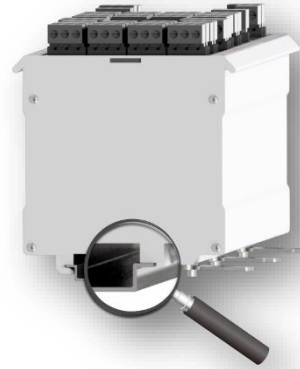
Step Three – Allocate the other end of the DIN rail at the base of the Remote, as illustrated in the figure above.

Step Four – With the base of the Remote properly allocated to the DIN rail, rotate the locks clockwise so that they are all properly fixed as illustrated in the figure above.

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ORDER SPECIFICATION

Remota - RTU

Table 1 – Power Supply	
Code	**Description**
0	30W Power Supply with no auxiliary power output.
1	Power Supply 30W with auxiliary power output 24 Vdc (2 Watts).
2	60W Power Supply with auxiliary power output 24 Vdc (2 Watts).

Table 2 – Processing Module - CPU	
Code	**Description**
1	1 RS-485 serial output (slave).
2	2 RS-485 serial outputs (slave).
3	1 RS-485 Serial Output (Slave) + 1 SD Card Input (datalogger).
4	2 RS-485 Serial Outputs (Slave) + 1 SD Card Input (datalogger).
5	1 RS-485 Serial Output (Slave) + Output with ST Fiber Optic connector.
6	2 RS-485 Serial Outputs (Slave) + Output with ST Fiber Optic connector.
7	1 RS-485 Output (Slave) + Output with ST Fiber Optic connector + 1 SD Card Input (datalogger).
8	2 RS-485 Outputs (Slave) + Output with ST Fiber Optic connector + 1 SD Card Input (datalogger).

Table 3 – Communication Module - DCM	
Code	**Description**
0	No communication module.
1	1 TCP/IP port with RJ-45 connector.
2	1 RS-485 Serial Output (Slave) + 1 TCP/IP port with RJ-45 connector.
3	1 TCP/IP port with RJ-45 connector + 1 SIM Card input.
4	1 RS-485 Serial Output (Slave) + 1 TCP/IP port with RJ-45 connector + 1 SIM card input.

Table 4 – Input and Output Modules			
Code	**Acronym**	**Function**	**Description**
0	-	No module	OPTION AVAILABLE ONLY FROM SLOT 2
2	.AI	Isolated Analog Input	8 Isolated Analog Inputs of 0...24 Vdc and 0...20 mA.
3	DI	Isolated Digital Input	8 isolated digital inputs 12...300 Vdc/Vac.
4	TO	Analog Output	8 Isolated Analog Outputs of 0...24 Vdc and 0...20 mA.
5	NIP	PNP and NPN input	8 active PNP/NPN inputs 0...24Vdc/5mA per channel.
6	OF	Digital Output	8 Digital Outputs to SPDT Relay (NAF) with 6 A.
7	RTD	Entrada RTD PT-100	8 Resistive signal inputs for reading PT-100 sensors (-50...850 °C).
8	DPT	Digital Input / RTD Input PT-100	4 isolated digital inputs 12...300Vdc/Vca + 4 resistive signal inputs PT-100 (-50...850 °C).

9	APT	Analog Input / RTD Input PT-100	4 Isolated Analog Inputs of 0...24 Vdc and 0...20 mA, 4 PT-100 resistive signal inputs (-50...850 °C).
A	DPN	Digital Input / PT-100 Input / Level Reading	4 Isolated Digital Inputs 12...300 Vdc/Vca + 2 PT-100 resistive signal inputs + 2 Resistive inputs 0...400 Ohms for level reading.
B	RBM	RBM Module – Bag Rupture Detector	1 Liquid sensor input (SLE) + 1 digital output to 6 A NAF Relay + 1 6 A NF relay digital output for sensor fault indication.