INOTEL

Product Catalogue

CONTENTS

Inotel

Inotel is a technology company that pioneers the development of the electricity and energy sectors. Since its establishment, it has been leading innovations in the sector with its strong R&D infrastructure, aiming for the development of domestic technology. The electronic devices it develops for industrial systems are produced with an innovative, future-oriented and superior quality approach. It develops and produces its products with the latest technology systems and a meticulous quality management process based on the highest technical criteria. Offering solutions focused on sustainability and economic efficiency, Inotel continues to make a difference in the sector with its reliable measurement, monitoring, protection and control devices.

VISION

To be a global, innovative and competitive organization that provides comprehensive safety, measurement and control solutions for energy production facilities, ensuring efficiency and sustainability in both local and global markets.

MISSION

To be a world-class organization providing specially designed, state-of-the-art measurement, control and safety products, including renewable energy production facilities, with our perfectionist processes and dedicated team focused on providing innovative solutions.

POWER

- Global Experience and Strong Business Relationships
- Comprehensive Engineering and Project Management Capability
- Collaboration with High Quality and Reliable Suppliers
- Dynamic Processes with On-Time Project Delivery

GRID MONITORING RELAY

GMR100

GMR product line of INOTEL products consists of Loss of Mains relays. As the leading product, GMR100, is a multi-function relay specifically developed for power plants and distribution substations in order to prevent islanding in the grid.

GMR100 monitors the grid live in terms of voltage and frequency. In case of a change in voltage or frequency beyond the limits set by the user, the relay disconnects the facility from the grid to secure anti-islanding. As soon as the grid parameters are back to the nominal values, GMR100 connects the facility back to the grid.

GENERAL

Operation Temperature	-25°C…+60°C
Protection Class	IP30
Mounting	DIN Rail
Nominal Voltage	18 – 36 Vdc

DIMENSIONS AND WEIGHT

Height x Width x Depth	86x105x57mm
Weight	680 gr.

MEASUREMENT RANGE

(L1, L2, L3 - N)	0 – 410 Vac
(L1, L2, L3)	0 – 580 Vac
(L - N)	0 – 410 Vac
Frequency	40 – 60 Hz

CONNECTION INTERFACES

RS485	1 port galvanic isolation
Relay Output	2 ports 10A@230Vac
Analog Input	1 port 3 P-N voltage measurement 30-410 Vrms with 1% tolerance
Digital Input	4 ports 24 Vdc optical isolation

PROTECTION FUNCTIONS

27U Undervoltage
59 Overvoltage
81U Under frequency
81O Over frequency
81R Rate of change of frequency (ROCOF)
BF Breaker failure
74TCS Trip circuit supervision
ARF Automatic Reclosure

HMI TOUCH PAD AND LED INDICATORS

Screen	2.8" TFT-LCD touch panel
Menu	System, Alarm, Setup
Functions	Setting protection and communication parameters Real-time recording & monitoring alarms
LEDs	Power, communication, error and positions information

CERTIFICATION

Compatibility	TS EN 61000-6-2:2019
	TS EN 61000-6-4:2020
	TS EN 50178:2003
	TS EN 60255:2014
	IEC 61010-1

AREAS OF USE

Solar PV Plants
Industrial Facilities
Wind Power Plants
Hydroelectric Power Plants

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LiFePO4 Long Life Rectifier

LiR24

Inotel LiR series rectifiers utilize LiFePO4 battery technology and innovative power electronics engineering. Thus, LiR series present the following:

- Long life
- Cost efficient
- High stability

GENERAL

Operation Temperature	-20°C - +70°C
Protection Class	IP20
Mounting	DIN ray
Dimensions	87 x 157 x 132 mm
Weight	2.250 gr.

OUTSTANDING FEATURES

- 24 Vdc Output Voltage (>98% Load Regulation)
- 10.000 Charge / Discharge Lifetime
- Deep discharge protection
- Short circuit and overload protection per cycle
- Long life thanks to protection functions

ELECTRICAL SPECIFICATIONS

Supply Voltage	220 Vac (+/- 20%)
Maximum Input Current	2 A
Output Voltage	24 Vdc
Maximum Output Current	3 A Continuous 10 A Short term
Battery Type	LiFePO4
Battery Capacity	6 Ah
LED Indicators	AC OK DC OK Battery Full

AREAS OF USE

- Low Voltage Panels
- Transformer Substations
- SCADA Systems
- Automation Systems

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BATTERY CHARGER RAG24

The Inotel RAG24 series battery charger is developed with innovative power electronics engineering techniques. Thus, the RAG24 provides users with:

- High efficiency
- Long lifespan
- Cost-effectiveness
- High stability

GENERAL

Operating Temperature	-25°C - +55°C
Storage Temperature	-25°C - +55°C
Humidity	95%
Protection Class	IP22
Cooling	Fan cooling
Dimensions	290mm*390mm*620mm
Weight	52kg

ELECTRICAL SPECIFICATIONS

Supply Voltage	230 Vac (+/- 20%)
Max. Input Current	6 A
Max. Input Power	1.125 VA
Output Voltage	21-27.6 Vdc
Max. Output Current	25 A
Max. Output Power	675 W
Power Factor	>0.8
Efficiency	>75%
Battery Charge Current	2.6 A

TEST & CERTIFICATION

IEC 60146-1-1	IEC 61000-4-4
IEC 61000-4-2	IEC 61000-4-5
IEC 61000-4-3	IEC 61000-4-6
IEC 60068-2-1	IEC 60529
IEC 60068-2-2	IEC 60896-21
IEC 62262	IEC 60146-1-3

HMI TOUCH SCREEN & LED INDICATORS

Screen	2.8" TFT-LCD touch panel
Menu	System/Alarm/Configuration
Functions	Constant Current or Voltage
LEDs	MCB Position and Alarm LEDs

CONNECTION INTERFACES

Communication	1x RS485 port for MODBUS
Relay Outputs	16x SPDT (NO/NC) 5 A 30 Vdc 10 A 250 Vac

AREAS OF USE

Transformer Stations
LV Distribution Panels
SCADA Systems
Automation Systems
Industrial Facilities
Power Plants

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BATTERY CHARGER RAG110

The Inotel RAG110 series battery charger is developed with innovative power electronics engineering techniques. Thus, the RAG110 provides users with:

- High efficiency
- Long lifespan
- Cost-effectiveness
- High stability

GENERAL

Operating Temperature	-25°C - +55°C
Storage Temperature	-25°C - +55°C
Humidity	95%
Protection Class	IP22
Cooling	Fan cooling
Dimensions	300mm*540mm*1240mm
Weight	146kg

ELECTRICAL SPECIFICATIONS

Supply Voltage	230 Vac (+/- 20%)
Max. Input Current	20 A
Max. Input Power	4750 VA
Output Voltage	121 Vdc
Max. Output Current	25 A
Max. Output Power	3100 W
Power Factor	>0.8
Efficiency	>75%
Battery Charge Current	2.6 A

TEST & CERTIFICATION

IEC 60146-1-1	IEC 61000-4-4
IEC 61000-4-2	IEC 61000-4-5
IEC 61000-4-3	IEC 61000-4-6
IEC 60068-2-1	IEC 60529
IEC 60068-2-2	IEC 60896-21
IEC 62262	IEC 60146-1-3

HMI TOUCH SCREEN & LED INDICATORS

Screen	2.8" TFT-LCD touch panel
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CONNECTION INTERFACES

Communication	1x RS485 port for MODBUS
Relay Outputs	16x SPDT (NO/NC) 5 A 30 Vdc 10 A 250 Vac

AREAS OF USE

- Transformer Stations
- LV Distribution Panels
- SCADA Systems
- Automation Systems
- Industrial Facilities
- Power Plants

FAULT PASSAGE INDICATOR AGD100

Designed for use in medium voltage networks, AGD100 is a microprocessor-controlled fault current monitoring system with a MODBUS communication port for transferring information to the SCADA centers, with a touch screen, and in compliance with the relevant specifications.

GENERAL

Supply Voltage	20 - 160 Vdc
Consumption	<10W
Nominal Voltage	6 – 70 kV
Operation Temperature	-25°C…+55°C
Storage Temperature	-30°C…+70°C
Protection Class	IP30 & IK07

CONNECTION INTERFACES

Analog Input	3 ports (3x In)
RS485	1 port
Digital Input	2 ports
Digital Output	2 ports
Alarm Output	1 port

DIMENSIONS AND WEIGHT

Height x Width x Depth	72x144x108mm
Weight	340 gr.
Mounting	Panel Type

AREAS OF USE

Solar PV Plants
Industrial Facilities
Wind Power Plants
Electricity Distribution Grid

FUNCTIONS

Application	Phase to Phase Fault Indication Phase to Earth Fault Indication
Neutral System	Connected over resistor or directly
Short-circuit Trip Current	Functional, 1 A intervals
Short-circuit Response Delay	50 ms
Earth Short-circuit Trip Current	Functional, 1 A intervals
Earth Short-circuit Response Delay	50 ms
Auto Reset	Current restoration
Manual Reset	via Reset button
Time Reset	1 – 6 hours
Communication	MODBUS via RS485 port
RTC	Available
Event Log	15 logs Memory recording available

HMI TOUCH PAD AND LED INDICATORS

Screen	2.8" TFT-LCD touch panel
Menu	System, Alarm, Setup
Functions	Setting protection and communication parameters Real-time recording & monitoring alarms
LEDs	Power, communication, error and positions information

CERTIFICATION

Compatibility	TS EN 60068-2
	TS EN 60529
	TS EN 62262
	TS EN 60255
	TS EN 61000

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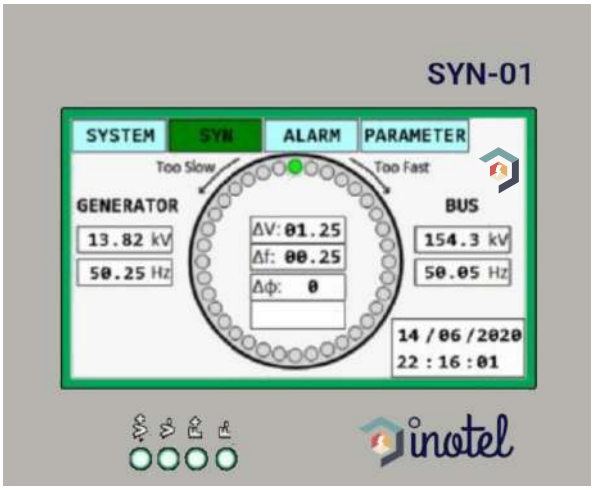
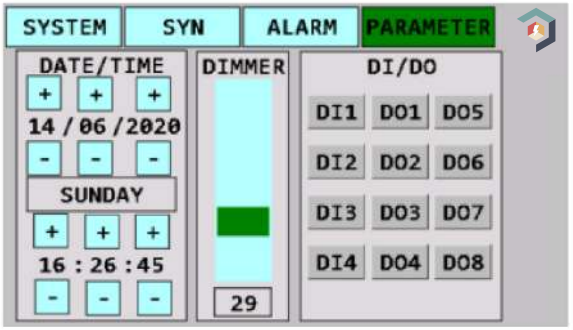
SYNCHRONIZATION RELAY SYN01

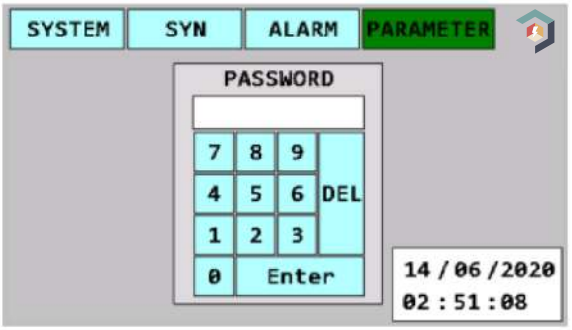
- Synchronization between Generators and Grid
- Synchronous and Diesel Gen Applications
- Successful Operations in Power Generation
- Plants including HPP, Biomass, Geothermal
- Simple and Flexible User Interface
- 4.3” Touch Screen
- 24 Vdc Supply Voltage
- 144 x 144 mm Standard Casing
- Compact Design

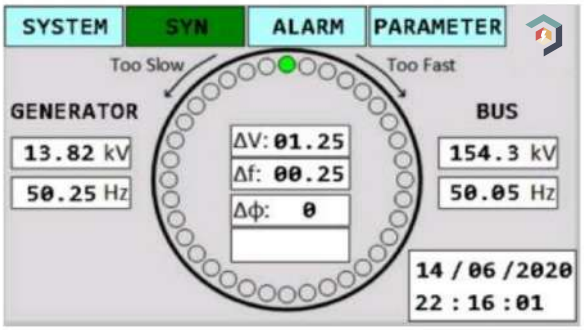


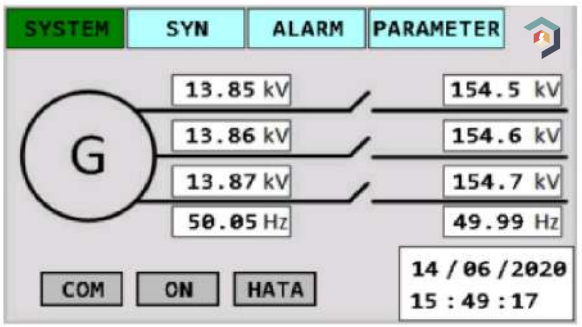
OUTSTANDING FEATURES

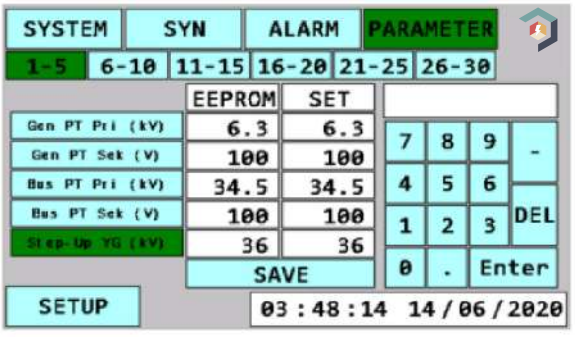
- Precise and Smooth Synchronization with DSP-based PLL Algorithm
- Opto-coupler based Digital I/Os
- Voltage Raise/Lower Outputs & LEDs
- Frequency Raise/Lower Outputs & LEDs
- Auto Synchronization Screen
- With or Without Step-Up Transformer Synch
- Adjustable PT Ratio
- Adjustable Output Pulse Duration
- Adjustable Max/Min Limit for Voltage & Frequency
- 3 or 1 Phase Synchronization Option
- Auto Island Mode Applications with 2 CB Option
- MODBUS RTU RS485 Communication
- Time Tagged Alarm List
- Password Protected Parameter Settings











INDUSTRIAL ROUTER MODEM

M100

M100 is a cellular router modem specially developed for industrial SCADA applications. Having 5 Ethernet (4x LAN + 1x WAN) ports, the M100 supports 802.11n locally and 2G/3G/4G communication globally.

GENERAL

Operating Temperature	-20°C - +60°C
IP Class	IP40
Mounting	DIN Rail
Supply Voltage	15 – 36 Vdc
Dimensions	142 x 87 x 32 mm
Weight	350 gr.

INTERFACES

Ethernet	4 x LAN + 1 x WAN (Magnetic insulation protection)
Antenna	2x Cellular 2x WiFi 1x GPS
Supply	6-pin terminal
External Memory	SD card slot
USB	1 (Optional)

COMMUNICATIONS

CELLULAR	
Standards	GSM/GPRS/EDGE/UMTS/HSPA
GPRS/EDGE	850/900/1800/1900 MHz
HSUPA	900/2100 or 850/1900 MHz optional, DL/UL 7.2/5.76 Mbps
HSPA+	850/900/1900/2100, DL/UL 21/5.76 Mbps
Network Protocols	PPP, PPPoE, TCP, UDP, DHCP, ICMP, NAT, DMZ,DDNS, VRRP, HTTP, HTTPs, DNS, ARP, QoS, Telnet
Miscellaneous	Static IP, L2TP, APN , VPN, IPSEC ,DDNS

WIFI	
Nr. of Antennas	1
Connector	RP-SMA-K
Standards	802.11b/g/n
Frequency	2.4 Ghz
Security	WEP, WPA-PSK, WPA2-PSK

MISCELLANEOUS

Software	Local and remote manageable
Configuration	Web/CLI software installation
Interface	Connection over TCP or SSH
Synchronization	SNTP, NTP
GPS supported.	
Username and password of the interface connection can be changed.	
MODBUS TCP supported.	
Supports automatic reset when IP is not available.	

AREAS OF USE

Industrial Facilities
Transformer Substations
Electricity Transmission
Hydroelectric Plants
Photovoltaic Plants
Wind Turbines
Water and Waste Facilities

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ENERGY ANALYZER EA-100E

Designed for use in measuring energy, voltage, current, instantaneous power values, current and voltage harmonics, EA 100 is a microprocessor controlled energy analyzer with a MODBUS Communication port for transferring information to the SCADA system/RTU, providing precise measurement, with a touch screen, and compliant with the relevant upper specifications.

FEATURES

Supply Voltage	80-364VAC
Consumption	≤8.8VA
Measuring Range	30-270VAC(L-N) 30-500VAC(L-L) 10mA-5A AC
Operating Temperature	-25°C…+70°C
Storage Temperature	-30°C…+70°C
Protection Class	IP30&IK-07
Accuracy	0,5 %
Current	In:5A/1A
Frequency	40-60Hz
Harmonics	Until 31(Odd numbers)

FUNCTIONS

Application	Phase-Neutral Voltage Measurement Phase- Phase Voltage Measurement Current Measurement Instantaneous Power Measurement Energy Measurement Current and Voltage Harmonic Measurement
Communication	MODBUS(RS485) TCP/IP
RTC	Available
Event Log	Up to 15 alarms can be stored in memory

CONNECTION INTERFACES

Analog Input	3xIn 3xPhase,1xNeutral
RS485	1 Port
TCP/IP	1 Port
Digital Input	1 Port
Digital Output	2 Port

HMI TOUCH PANEL

Display	2.8” TFT-LCD Touch Display
Menus	Main Page, Alarm, Harmonics, Energy Measurement, Setup
Functions	Protection, communication and input-output parameter settings Real-time recording and monitoring of alarm situations Monitoring 33 pieces of data and current/voltage harmonics of each phase

DIMENSIONS

Height x Width x Depth	96x96x72mm
Weight	325 gr.
Assembly	Panel Type

TESTING & CERTIFICATION

Compatibility Tests	EN 61010-1
	EN 61000-4-3
	EN ISC 61326-1
	EN 55011

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ENERGY ANALYZER EA-100R

Designed for use in measuring energy, voltage, current, instantaneous power values, current and voltage harmonics, EA 100 is a microprocessor controlled energy analyzer with a MODBUS Communication port for transferring information to the SCADA system/RTU, providing precise measurement, with a touch screen, and compliant with the relevant upper specifications.

FEATURES

Supply Voltage	80-364VAC
Consumption	≤8.8VA
Measuring Range	30-270VAC(L-N) 30-500VAC(L-L) 10mA-5A AC
Working Temperature	-25°C…+70°C
Storage Temperature	-30°C…+70°C
Protection Class	IP30&IK-07
Accuracy	0,5 %
Current	In:5A/1A
Frequency	40-60Hz
Harmonics	Until 31(Odd numbers)

FUNCTIONS

Application	Phase-Neutral Voltage Measurement Phase- Phase Voltage Measurement Current Measurement Instantaneous Power Measurement Energy Measurement Current and Voltage Harmonic Measurement
Communication	MODBUS (RS485)
RTC	Available
Event Log	Up to 15 alarms can be stored in memory

CONNECTION INTERFACES

Analog Input	3xIn 3xPhase,1xNeutral
RS485	1 Port
Digital Input	1 Port
Digital Output	2 Port

HMI TOUCH PANEL

Display	2.8” TFT-LCD Touch Display
Menus	Main Page, Alarm, Harmonics, Energy Measurement, Setup
Functions	Protection, communication and input-output parameter settings Real-time recording and monitoring of alarm situations Monitoring 33 pieces of data and current/voltage harmonics of each phase

DIMENSIONS

Height x Width x Depth	96x96x72mm
Weight	325 gr.
Assembly	Panel Type

TESTING & CERTIFICATION

Compatibility Tests	EN 61010-1
	EN 61000-4-3
	EN ISC 61326-1
	EN 55011

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ENERGY ANALYZER EA-100B

Designed for use in measuring energy, voltage, current, instantaneous power values, current and voltage harmonics, EA 100 is a microprocessor controlled energy analyzer with a MODBUS Communication port for transferring information to the SCADA system/RTU, providing precise measurement, with a touch screen, and compliant with the relevant upper specifications.

FEATURES

Supply Voltage	80-364VAC
Consumption	≤8.8VA
Measuring Range	30-270VAC(L-N) 30-500VAC(L-L) 10mA-5A AC
Working Temperature	-25°C…+70°C
Storage Temperature	-30°C…+70°C
Protection Class	IP30&IK-07
Accuracy	0,5 %
Current	In:5A/1A
Frequency	40-60Hz
Harmonics	Until 31(Odd numbers)

FUNCTIONS

Application	Phase-Neutral Voltage Measurement Phase- Phase Voltage Measurement Current Measurement Instantaneous Power Measurement Energy Measurement Current and Voltage Harmonic Measurement
RTC	Available
Event Log	Up to 15 alarms can be stored in memory

CONNECTION INTERFACES

Analog Input	3xIn 3xPhase,1xNeutral
Digital Input	1 Port
Digital Output	2 Port

HMI TOUCH PANEL

Display	2.8” TFT-LCD Touch Display
Menus	Main Page, Alarm, Harmonics, Energy Measurement, Setup
Functions	Protection, communication and input-output parameter settings Real-time recording and monitoring of alarm situations Monitoring 33 pieces of data and current/voltage harmonics of each phase

DIMENSIONS

Height x Width x Depth	96x96x72mm
Weight	325 gr.
Assembly	Panel Type

TESTING & CERTIFICATION

Compatibility Tests	EN 61010-1
	EN 61000-4-3
	EN ISC 61326-1
	EN 55011

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ELECTRIC VEHICLE CHARGER

INOCHARGE

Inotel Inocharge is an AC charging station designed for easy and user-friendly EV charging. It features simple installation and operation.
Available in tethered (with a fixed cable) and untethered (with a socket) models, it also offers optional colour choices. It supports all electric vehicles on the market and ensures safe charging.
The Inotel Mobile APP allows control and monitoring via Wi-Fi/ Ethernet. A 3-stage power limit can be set based on your system and preferences through the APP.
With 7kW, 11kW, and 22kW power options, Inocharge enables flexible and efficient charging for different EVs.

GENERAL

Charging Power	7kW(10A), 11kW(16A), 22kW(32A)
Models	Tethered and Untethered (Optional)
Cable Length	5 Meter
Colour	Optional (Black, Anthracite, Red, Dark Blue)
Connector Type	Type 2
Connection	Wifi/Ethernet(RJ45)
Communication Protocols	OCCP 1.6J
Energy Meter	Internal Energy Measurement(2% Accuracy)
Status Indicators	Device Status LEDs (Power, Wifi, RFID) Charge Status and Error LED (Ring LED)
User ID	Inotel Mobile APP Inotel RFID Card (2 Pieces)
Protection	Residual Current Protection (30mA) High Voltage Low Voltage Emergency Stop Button

TECHNICAL SPECIFICATIONS

Connection	3 Phase, 1 Neutral, 1 Earth
Input/Output Voltage ±10	400V(L-L)
Current	400 VAC(L-L),50-60Hz
Cable Cross Section	5 x 6 mm²
Operating Temperature	Between -25ºC and 60ºC
Storage Temperature	Between -40ºC and 70ºC
Charge Mode (IEC 61851-1)	Mode 3
Assembly	1 Wall Fixing Bracket
Event Log	Available
Energy Recording	Available
Charging Planning	Available
Cost Calculation (kWh)	Available

AREAS OF USE

- Residential
- Commercial Buildings
- Public Facilities
- Factories & Industrial Sites
- Fleet Operations
- Public Parking Lots
- EV Charging Networks

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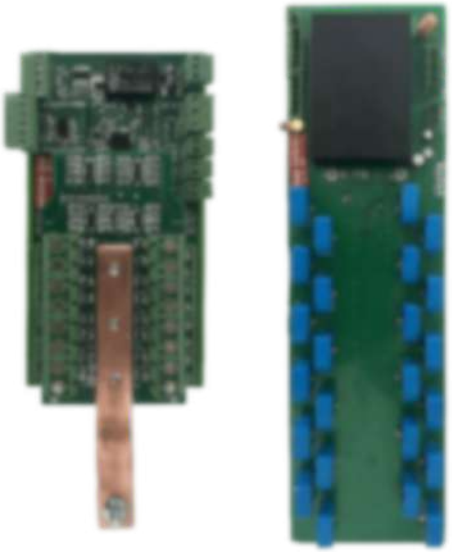
PV STRING MONITORING UNIT

STR100

STR100 is an electronic monitoring device developed for DC combiner box where strings are combined in Photovoltaic Solar Power Plants. The device, which is mounted on the DC combiner box, allows live monitoring of the voltage and string currents in the panel. Thanks to the live current voltage monitoring, faulty strings or strings with low production can be detected very quickly. The device has a wired communication feature via the RS45 port and also has a port suitable for fiber optic cables. In addition, the innovative LoRa wireless communication technology, which provides healthy communication over long distances, is among the features of the product. Thanks to LoRa, healthy communication can be achieved even in large areas without the need for any communication cable installation.



- Compact size and light weight
- Easy mounting on DC combiner box (Retrofit possibility)
- High measurement accuracy in wide temperature range
- Internal power supply up to 1500Vdc
- Monitoring up to 32 strings.

GENERAL

Supply Voltage	200 - 1500 Vdc 18 - 75 Vdc
Power Consumption	<15 W <6 W
Measurement Method	Resistive Hall Effect (Optional)

ELECTRICAL SPECIFICATIONS

Maximum Measurement Voltage	1500 Vdc
Voltage Measurement Accuracy	0.5%
Maximum Measurement Current	25 A / String 40 A / String
Current Measurement Accuracy	0.5%
Communication	Modbus over RS485 Modbus over F/O LoRa
Communication Speed	9,600 – 38,400
IP Addressing	DIP-switch set

DIMENSIONS

Height x Width x Depth	54x317x128 mm
Weight	640 gr
Assembly	DIN-Ray

CONNECTION INTERFACES

RS485	1 port (Optional)
Fiberoptic	1 port (Optional)
LoRa	1 port (Optional)
Digital Input	4x 24 Vdc (NO)
Analog Input 1	Pt100 Temperature Sensor
Analog Input 2	0 – 20 mA
Analog Input 3	0 – 10Vdc
Number Of Strings	16 pieces / 24 pieces / 32 pieces

OPERATING CONDITIONS

Operating Temperature	-40°C…+85°C
Storage Temperature	-30°C…+70°C

TESTING & CERTIFICATION

Type Tests	IEC 61000-4-2
	IEC 61000-4-3
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61000-4-6
	IEC 61000-4-8

AREAS OF USE

Solar Power Plants

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SUPERCAPACITOR SUPPLY SCAP 12-20

The SCAP product family creates an infrastructure that will form the basis of an uninterrupted system, which is gaining more and more importance in smart grids. The device is designed to supply the system for at least 3 minutes (with a load of 3.5 Watts/minute) in case of interruption in systems fed with alternating current (DC). Thanks to the charge limiter used at the input of the device, it can be charged with a constant 0.20 A charge current.

SCAP provides short term power supply for systems such as communication devices so that the system stays alive for a sufficient period to transmit necessary signals to communication center during electricity cuts.

GENERAL

Operating Temperature	-20°C - +70°C
IP Class	IP40
Mounting	DIN Rail
Supply Voltage	12 Vdc

SPECIFICATIONS

Input Voltage	12 Vdc
Input Power	<3VA
Output Voltage	12 Vdc
Output Power	12 W
Discharge Period	180 seconds (3.5 Watt/min load)
Dimensions	150 x 80 x 35 mm

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OUTAGE DETECTION SYSTEM SOM&GAD

SOM&GAD is an electricity outage detection system specifically designed for industry and electricity distribution grids. The wireless sensors (GAD) are placed on the outer insulation of the cable and the sensors detect voltage on the conductor only by touching the outer insulation. Each sensor is powered by Li-ion batteries and transmits the information via LoRa, therefore no cabling is necessary for the sensors. The LoRa gateway (SOM) collects the signals from each sensor then transmits them via MODBUS protocol.

- Compact size and light weight
- Easily mounted inside LV panels (Retrofit possible)
- Sensors measuring voltage without touching inside conductor
- Sensors with Li-ion battery, no battery replacement up to 7 years
- Sensors with LoRa communication
- Communication with other LoRa devices (e.g. sensors, gateways etc.)

GENERAL

LoRa GATEWAY (SOM)	
Operation Temperature	-20°C…+60°C
Protection Class	IP20
Mounting	DIN
Supply Voltage	9 – 36 Vdc

VOLTAGE SENSOR (GAD)	
Operation Temperature	-20°C…+60°C
Protection Class	IP20
Mounting	On cable insulation
Supply Voltage	Li-ion battery 3.6V / 9Ah

DIMENSIONS AND WEIGHT

LoRa GATEWAY (SOM)	
Height x Width x Depth	86x105x57mm
Weight	170 gr.

VOLTAGE SENSOR (GAD)	
Height x Width x Depth	35x70x40mm
Weight	100 gr

COMMUNICATION

LoRa GATEWAY (SOM)	
Protocols	MODBUS, LoRa
Number of Antennas	1 piece
Connector	RP-SMA-K

VOLTAGE SENSOR (GAD)	
Protocols	LoRa
Number of Antennas	1 piece
Connector	RP-SMA-K

CONNECTION INTERFACES

LoRa GATEWAY (SOM)	
RS485	1 piece (galvanic isolation)
Supply	2 pin terminal
External Memory	SD card slot

VOLTAGE SENSOR (GAD)	
RS485	1 piece (galvanic isolation)
Supply	2 pin terminal

AREAS OF USE

Electricity Distribution Grids
Power Plants
Industrial Facilities

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SURGE FILTER

SURGE FILTER

Surge filters, used in a wide range of applications from industrial machines to sensitive electronic devices, provide effective protection against damage that may be caused by high voltage surges. These filters increase the safety of electronic devices, especially in energy systems, production lines and laboratory environments, preventing possible failures and system interruptions.

By quickly and effectively dampening the effects of high voltage surges, they ensure that your devices operate more efficiently for a longer period of time. In addition, they increase the stability of the systems, prevent performance losses and reduce maintenance costs. In this way, they extend the life of your devices while ensuring the continuity of your production processes.

GENERAL

Operating Voltage	0-63 Vdc
Operating Temperature	-40°C…+80°C
Storage Temperature	-45°C…+85°C
Protection Class	IP20
Maximum Surge Withstand Voltage	2 kV

DIMENSIONS

Height x Width x Depth	86 x 36 x 59 mm
Weight	60 g
Assembly	DIN-RAY

CONNECTION INTERFACES

Power Input	1 Port
Power Output	1 Port

AREAS OF USE

Industrial Facilities
Hydroelectric Power Plants
Solar Power Plants
Wind Turbines

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IoT GATEWAY - RPM 100 RTU

RPM100 RTU is an IoT Gateway device that combines datalogger and modem/router features especially developed for industrial SCADA applications. Having 1 Ethernet (1x LAN) port, the RPM100 RTU supports 802.11n local area communication and 2G/3G/4G wide area communication with IEC 60870-5-104, Modbus RTU/TCP, MQTT and IEC 62056-21 protocols.

FEATURES

Supply Voltage	9-36VDC
Consumption	2.5W at idle, 4W at full load
Operating Temperature	-20°C…+60°C
Storage Temperature	-30°C…+70°C
Protection Class	IP20
Network Protocols	PPP/PPPoE, TCP, UDP, DHCP, ICMP, NAT, DMZ, DDNS, HTTP/HTTPS, DNS, ARP, QoS, SSH, NTP
VPN Tunnels	L2TP, IPsec, OpenVPN

FUNCTIONS

Supported Protocols	IEC 60870-5-104 Modbus RTU Master Modbus TCP Master/Slave IEC 62056-21 (Mode C) MQTT/MQTTS
Communication	MODBUS(RS485) TCP/IP
RTC	Available and synchronisable with NTP/SNTP
Event Log	Up to 10,000 timestamped event logs with 1ms resolution
Configuration Interface	Configurable via CLI with SSH or via Web Interface with HTTP

CONNECTION INTERFACES

RS485	2 Port (Galvanically Isolated)
TCP/IP	1 Port as LAN
Digital Input	4 Port (up to 50VDC) with Optical Insulation (Expandable with 8/16 DI Modules)
Digital Output	4 Port (up to 50VDC) with Optical Insulation (Expandable with 4/8 DO Modules)
WLAN	1T/1R as 1xRP-SMA, supports 2.4GHz 802.11b/g/n with WEP and WPA/WPA2-PSK
Cellular	1T/1R as 1xSMA, supports 2G/3G and 4G networks
USB	1 port, can be used as external memory or for firmware updates

CELLULAR PROPERTIES

Standards	GSM/GPRS/EDGE/UMTS/HSDPA/HSUPA/HSPA+/LTE-FDD/LTE-TDD
GSM/GPRS/EDGE	B3(1800MHz)/B8(900MHz) up to 236kbit DL/UL
UMTS	B1(2100MHz)/B5(850MHz)/B8(900MHz) up to 21Mbit DL/5.76Mbit UL
LTE-TDD	B38(2600MHz)/B40(2300MHz)/B41(2500MHz) up to 130Mbit DL/30Mbit UL
LTE-FDD	B1(2100MHz)/B3(1800MHz)/B5(850MHz)/B7(2600MHz)/B8(900MHz)/B20(800MHz)/B28(700MHz) up to 150Mbit DL/50 Mbit UL

DIMENSIONS

Height x Width x Depth	142x105x65mm
Weight	250 gr.
Assembly	DIN Rail

TESTING & CERTIFICATION

Compatibility Tests	IEC/EN 60255-26:2013
	IEC/EN 60068-2
	IEC/EN 61000-4
	IEC/EN 60529

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VOLTAGE MEASUREMENT SYSTEM

VIS100

VIS100 is a Low Power Voltage Measurement System specially designed to endure electricity grid conditions. The system presents stable voltage measurement on 12kV/24kV/36kV grids with high accuracy and long life.

VIS100 enables medium voltage measurement inside switchgears without voltage instrument transformers. Thus, line voltage could be measured by energy analyzers, protection relays, meters etc.

- Compact size and light weight
- Easily mounted inside switchgears (Retrofit possible)
- High accuracy and reliability over a wide range of temperature
- Mount and measure (No on-site calibration required)
- Certification for ensuring maximum reliability

ELECTRICAL PROPERTIES

Input Voltage	18-150VDC or 24-260VAC
Consumption	<10 VA
Measurement Accuracy	Class 0.5
ELECTRONIC UNIT	
Input Voltage	3x 3,25/√3 V
Output Power	1 VA / phase
Output Voltage	3x100/√3 V
Nominal Frequency	50 Hz
Input Impedance	1 Mohm
MEASUREMENT SENSOR	
Rated Voltage	12kV / 24kV / 36kV
Method	Ohmic Division

OPERATING CONDITIONS

Operation Temperature	-25°C…+70°C
Storage Temperature	-25°C…+70°C
Protection Class	IP40 & IK-07

DIMENSIONS AND WEIGHT

ELECTRONIC UNIT	
Height x Width x Depth	160x105x55mm
Weight	680 gr.
Mounting	DIN-Rail
MEASUREMENT SENSOR	
Height x Width	300x80mm
Weight	1900 gr

CABLE SET

Type	Coaxial
Length	min. 3 mt.

CONNECTION INTERFACES

Input Voltage	3x Phase + Neutral
Output Voltage	3x Phase + Neutral

TEST & CERTIFICATION

Type Tests	IEC 61000-4-2
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61010
	IEC 61869-6
	EN 60529
Lightning Impulse Withstand	170 kV / 125 kV / 75kV
Insulation Test (1 minute)	70kV / 50kV / 28kV
Measurement Accuracy	0.5%

AREAS OF USE

- Electricity Distribution Grids
- Power Plants
- Industrial Facilities

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VOLTAGE MEASUREMENT SYSTEM

VIS100+

VIS100+ is a Low Power Voltage Measurement System specially designed to endure electricity grid conditions. The system presents stable voltage measurement on 12kV/24kV/36kV grids with high accuracy and long life.

VIS100+ enables medium voltage measurement inside switchgears without voltage instrument transformers. Thus, line voltage could be measured by energy analyzers, protection relays, meters etc.

- Compact size and light weight
- Easily mounted inside switchgears (Retrofit possible)
- High accuracy and reliability over a wide range of temperature
- Mount and measure (No on-site calibration required)
- Certification for ensuring maximum reliability
- Color LED touch screen

ELECTRICAL PROPERTIES

Input Voltage	18-150VDC or 24-260VAC
Consumption	<10 VA
Measurement Accuracy	Class 0.5
ELECTRONIC UNIT	
Input Voltage	3x 3,25/√3 V
Output Power	1 VA / phase
Output Voltage	3x100/√3 V
Nominal Frequency	50 Hz
Input Impedance	1 Mohm
MEASUREMENT SENSOR	
Rated Voltage	12kV / 24kV / 36kV
Method	Ohmic Division

HMI TOUCH PAD

Screen	2.8" TFT-LCD color touch panel
Menu	System, Alarm, Setup
Functions	Setting communication parameters Real-time monitoring

DIMENSIONS AND WEIGHT

ELECTRONIC UNIT	
Height x Width x Depth	160x105x55mm
Weight	680 gr.
Mounting	DIN-Rail
MEASUREMENT SENSOR	
Height x Width	300x80mm
Weight	1900 gr

CABLE SET

Type	Coaxial
Length	min. 3 mt.

CONNECTION INTERFACES

Input Voltage	3x Phase + Neutral
Output Voltage	3x Phase + Neutral
RS485	2 piece(s)

OPERATING CONDITIONS

Operation Temperature	-25°C…+70°C
Storage Temperature	-25°C…+70°C
Protection Class	IP40 & IK-07

TEST & CERTIFICATION

Type Tests	IEC 61000-4-2
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61010
	IEC 61869-6
	EN 60529
Lightning Impulse Withstand	170 kV / 125 kV / 75kV
Insulation Test (1 minute)	70kV / 50kV / 28kV
Measurement Accuracy	0.5%

AREAS OF USE

- Electricity Distribution Grids
- Power Plants
- Industrial Facilities

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OVERCURRENT PROTECTION RELAY

OCPR-100

Introducing our advanced overcurrent protection relay, meticulously engineered to deliver comprehensive safeguarding for transformers, motors, and busbars across medium and low voltage applications. By continuously monitoring current inputs via connected current transformers, the relay promptly detects anomalies and, based on user-defined configurations, activates integrated relays and communicates fault conditions through the MODBUS protocol. This ensures rapid and reliable responses to electrical faults, enhancing the safety and efficiency of your power distribution systems.

GENERAL

Supply Voltage	24V – 110V DC
Operating Temperature	- 40°C... + 80°C
Storage Temperature	- 45°C... + 85°C
Power Consumption	240 mW
Protection Class	IP20

DIMENSIONS

Height x Width x Depth	152 x 152 x 218 mm
Weight	1.5 kg
Assemblage	Panel Mount

CONNECTION INTERFACES

Power Input	1 Piece
RS485	1 Piece
USB	1 Piece
Relay Output	5 Pieces
Isolated Digital Input	9 Pieces
Current Transformer Input (5A)	4 Pieces
Current Transformer Input (1A)	4 Pieces

MEASUREMENT

Current	5A / 1A
Sensitivity	± 1%A

PROPERTIES

Screen	2.8" TFT-LCD Touch Panel
Menus	System, Alarm, Setup
Functions	Setting protection and communication parameters Real-time recording and monitoring of alarm conditions
LEDs	Power, communication, 5x Programmable LED
Communication	MODBUS RTU, USB, IEC 60870 -5-103

OVERCURRENT CHARACTERISTICS

- Normal Inverse (IEC SI)
- Moderately Inverse (ANSI MI)
- Very Inverse (IECVI)
- Very Inverse (ANSI VI)
- Extremely Inverse (IEC EI)
- Extremely Inverse (ANSI EI)
- Long Time Inverse (IEC LTI)

PROTECTION FUNCTIONS

- Phase Overcurrent (ANSI 50, 51)
- Derived Earth Fault (ANSI 50N, 51N)
- Measured Earth Fault (ANSI 50G, 51G)
- Cold Load (ANSI 51C)
- Sensitive Earth Protection (ANSI 50SEF, 51SEF)
- Broken Conductor (ANSI 46BC)
- Negative Phase Sequence Overcurrent (ANSI 46NPS)
- Reverse Phase or Phase Balance Current (46)
- Lockout Relay (86)
- Cold Load Pick-Up (CLP)
- Trip Circuit Monitor (TCM)
- Breaker Failure Protection (BF)
- Undercurrent Protection (37)
- Restricted Earth Fault Protection (REF)
- Inrush Detector (HBL2)
- Total Harmonic Distortion Supervision (THD)
- Thermal Overload (49)
- Auto-Reclose (79)

AREAS OF USE

- Electricity Grid
- Power Plants
- Industrial Facilities

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