Treetech

SDG

Smart Device Gateway

PRODUCT CATALOG

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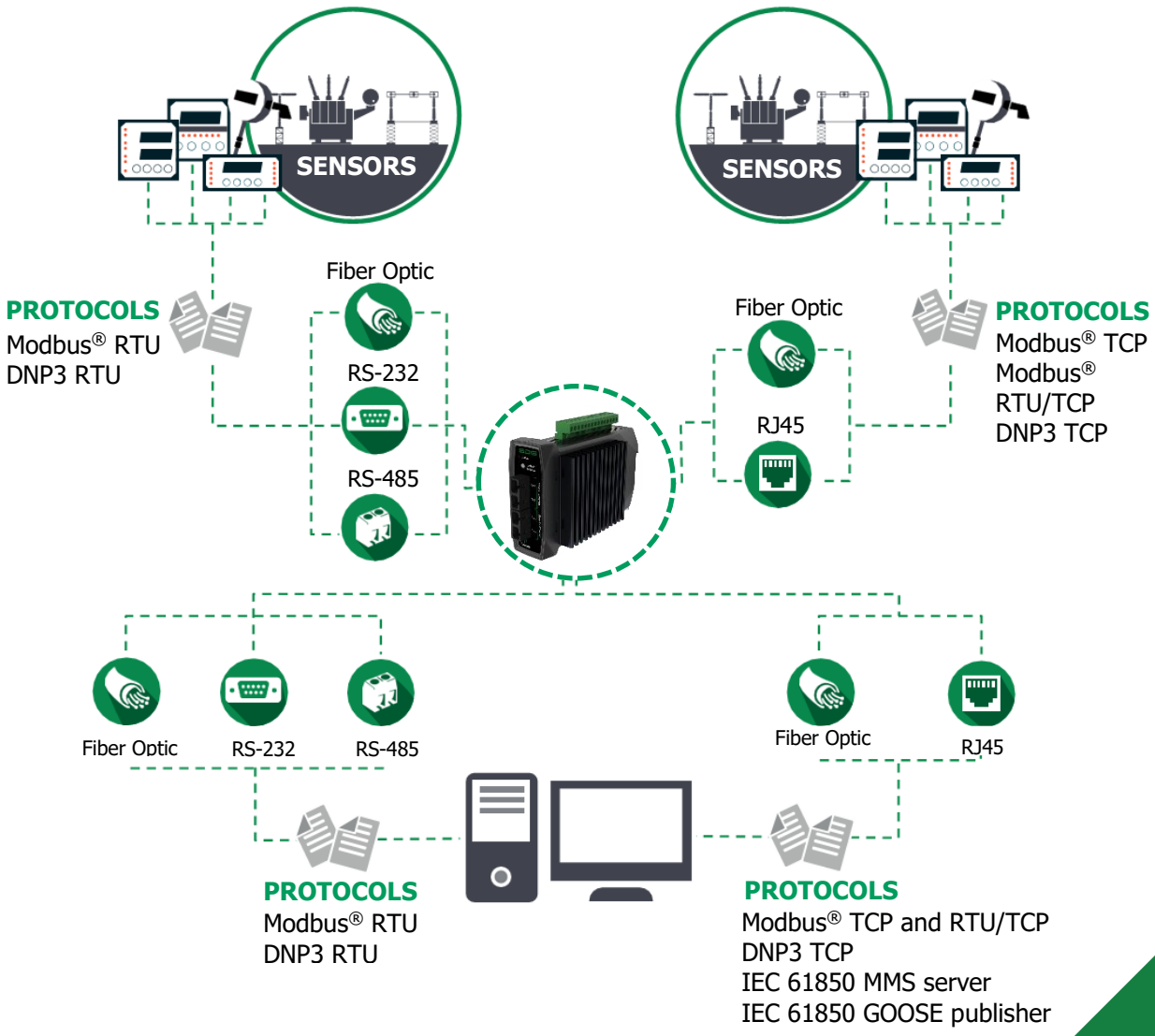
HOW TO DEAL WITH DIFFERENT COMMUNICATION PROTOCOLS ON THE NETWORK?

The Smart Device Gateway (SDG) was created to fully aggregate information from any equipment compatible with Modbus and/or DNP3 protocols and redistribute it in a highly customizable way in these protocols and even in those of the IEC 61850 standard.

Therefore, the SDG enables the integration of systems that have or do not have the same protocols or physical means of communication. Moreover, data is easily presented and managed through an intuitive and user-friendly web interface.

SYSTEM TOPOLOGY



INDEPENDENT COMMUNICATION PORTS

✓ The SDG is equipped with independent communication ports, each associated with a specific IP.

PROTOCOLS FOR CLOCK SYNCHRONIZATION

✓ The equipment has different time protocols for clock synchronization, which are:

- NTP (Network Time Protocol);
- PTP (Precision Time Protocol).

01 Real-time measurement values

02 Access security via HTTPS

03 Profiles with different operating permission levels

04 Clock and synchronization configuration via NTP or PTP protocol

05 Download of logs and oscillograms

06 Communication status and error statistics

IED

- ✓ This IED (Intelligent Electronic Device) was designed with a modern and compact design specifically for application in substations and industrial or commercial installations.

REMOTE INFORMATION

- ✓ All product management and configuration are done directly through a friendly web interface, making updates simple and intuitive, and the best: all this without the need for a license or proprietary software installation.

EXTENDED COMMUNICATION

- ✓ High-speed communication via Ethernet or serial;
- ✓ Redundancy or distribution to various systems through its multiple outputs:
  - FO FO – 2 Ethernet F.O.;
  - FO SR – 1 Ethernet F.O. + 1 serial F.O.;
  - RJ45 – 2 Ethernet RJ45;
  - 1 RS-485/RS-232 serial communication port;
  - 1 RS-485 serial communication port.
- ✓ Standard supply communication protocols:
  - Modbus® RTU, Modbus® TCP, Modbus® RTU/TCP;
  - DNP3 RTU, DNP3 TCP;
  - IEC 61850 MMS Server;
  - IEC 61580 GOOSE Publisher.

SELF-DIAGNOSIS AND WARNINGS

- ✓ Self-diagnostics for detecting internal faults;
- ✓ RGB LED for signaling communication problems and warnings.

STANDARD IP ACCESS BUTTON

- ✓ The Smart Device Gateway (SDG) includes a user-available button that allows the use of the factory default IP when network parameters are forgotten.

TECHNICAL DATA

HARDWARE	
Supply voltage	85...265 Vac/Vdc, 50/60 Hz
Maximum consumption	< 12 W
Operating temperature	-40... 85°C
Degree of protection	IP20
Connections	0,3…2,5mm², 22…12 AWG
Fixing	Panel
INPUTS	
Dry contacts	7 inputs and 1 common
Contacts power supply	Internal reference supply
OUTPUTS	
Relay output	1 NC relay (normally closed)
Maximum switching power	70 W (dc) / 200 VA (ac)
Maximum switching voltage	250 Vdc / 250 Vac
Maximum switching current	5 A
NETWORK INTERFACES	
Serial communication ports	1 RS-485 (TIA-485-A), 1 RS-485 (TIA-485-A) or 1 RS-232 (TIA-232-F)
Communication ports IEEE 802.3 (10/100 Mbps)[1]	Available in models: RJ45: 2 Ethernet RJ45 (10/100BASE-T) FOFO: 2 Ethernet Fiber Optic (10/100BASE-FX; MM 1310nm SC connector) FOSR: 1 Ethernet Fiber Optic (10/100BASE-FX; MM 1310nm SC connector) + 1 Serial Fiber Optic (MM 850nm SC connector)
Master / Client protocols	Modbus® (RTU and TCP) and DNP3 (RTU and TCP)
Slave / Server protocols	Modbus® (RTU and TCP) and DNP3 (RTU and TCP) IEC 61850 (MMS server / GOOSE Publisher)[2]
DIMENSIONS	
SDG Dimension (Fiber Optic)	54,70 mm x 114 mm x 155 mm
SDG Dimension (RJ45)	54,70 mm x 114 mm x 146 mm

[1] The customer must choose one of the three options.
[2] The .icd file can be created from any .icd generator software and later imported through the web interface.

FEATURES AND FUNCTIONS

Robust hardware

The SDG was designed to work in a substation electrical environment and can be installed directly on the transformer panel.

Embedded Operating System

The SDG gateway has an embedded operating system, customized by Treetech, and tested in various security and stability requirements. This ensures greater reliability of product operation, as well as being future proof.

Management of Users and Access Profiles

To ensure data access security, the SDG gateway works with profiles of different operation, configuration, and administration access levels.

Reduced Size

Despite its advanced functionality, the SDG has an extremely small physical size of 38 mm x 114 mm x 155 mm.

Customization of IEDs Protocol Maps

Through a friendly interface, the user is able to edit or create custom IED mappings, including merging IEDs and converting protocols.

Remote Update

Through the web interface, the firmware update process becomes extremely simple and intuitive.

Clock Synchronism

SDG gateway allows clock synchronization configuration via NTP, PTP or RTC protocol.

Communication Log Download

The SDG provides in its interface the download of the communication protocols LOG to facilitate the diagnosis of the network.

Expertise in Embedded Systems

Treetech has experts in embedded operating systems with extensive experience in the area. This knowledge has been built into the SDG making it an extremely safe and stable product, while remaining easy to operate.

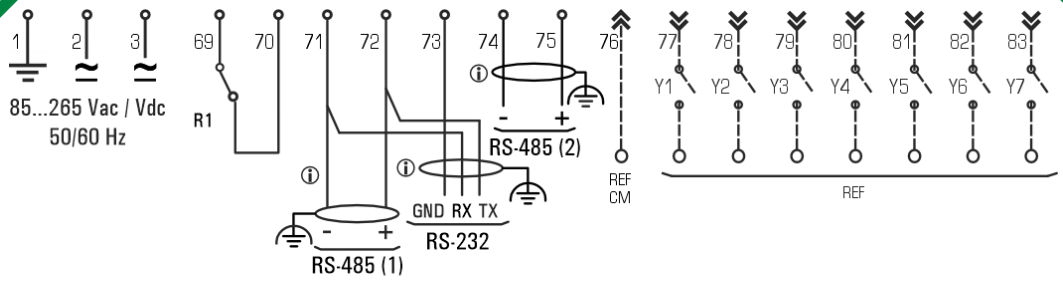
Compliance with International Standards

Treetech is concerned with product standardization and serving customers in the most diverse applications. The SDG complies with national and international standards as shown by the tests described in the Test Reports table.

TEST REPORTS

IMMUNITY TO HIGH ENERGY SURGES (IEC 60255-22-5)	
Differential mode	1 kV (+/-)
Common mode	2 kV (+/-)
IMMUNITY TO ELECTRICAL TRANSIENTS (IEC 60255-22-1, IEC 61000-4-12 and IEEE C37-90-1)	
Peak value 1st cycle	2,5 kV (common modem), 1 kV (diff. mode)
Frequency	1 MHz
Repetition rate	200 burts/s
APPLIED VOLTAGE (IEC 60255-5)	
Dielectric strength	2 kV at 60 Hz for 1 minute
Voltage impulse	5 kV (+/-)
IMMUNITY TO IRRADIATED ELECTROMAGNETIC FIELDS (IEC 60255-22-3)	
Frequency	80...2500 Mhz
Field strength	10 V/m
IMMUNITY TO CONDUCTED ELECTROMAGNETIC DISORDERS (IEC 60255-22-6)	
Field strength	10 Vrms
Frequency	0.15 to 80 MHz
Index of modulation	80% and 1 kHz sinusoidal
Sweep frequency	150 kHz to 80 MHz
Fixed frequencies	27 to 68 MHz
Duration	20 s
Power supply	220 V / 60 Hz
IMMUNITY TO INDUSTRIAL FREQUENCY MAGNETIC FIELDS (IEC 60000-4-8)	
Magnetic field strength and direction	30 A/m 3 orthogonal axes
ELECTROSTATIC DISCHARGES (IEC 60255-22-2)	
Discharge by contact	8 kV
Discharge in air	15 kV
IMMUNITY TO ELECTRICAL FAST TRANSIENTS (IEC 60255-22-4)	
Power, inputs and outputs (Class A)	4 kV (+/-)
Communication (Class A)	2 kV (+/-)

CONDUCTED EMISSION (IEC 60255-25)	
Conducted emission limits (Class A)	79 dB (uV) @ 150 kHz...500 kHz (QP) 73 dB (uV) @ 500 kHz...30 MHz (QP) 66 dB (uV) @ 150 kHz...500 kHz (AV) 60 dB (uV) @ 500 kHz...30 MHz (AV)
RADIATED EMISSION (IEC 60255-25)	
Radiated emission limits (Class A)	40 dB (uV/m) @ 30 MHz...230 MHz (QP) 47 DB (uV/m) @ 230 MHz...1 GHz (QP)
POWER FAILURE (IEC 61000-4-11)	
Amplitude variation	0…80% Amplitude
Cycles affected	½...300 cycles
Power supply	127 V / 60 Hz and 220 V / 60 Hz
COLD WITHSTANDINGNESS (IEC 60068-2-1)	
Temperature	-40
Test time	16 hours
DRY HEAT WITHSTANDINGNESS (IEC 60068-2-1)	
Temperature	85 ºC
Test time	16 hours
MOIST HEAT WITHSTANDINGNESS (IEC 60068-2-1)	
Temperature	40 ºC at 85% RH
Test time	24 hours
THERMAL CYCLE (IEC 60068-2-1)	
Temperature range	-40…85 ºC
Total test time	120 hours
RESPONSE TO VIBRATION (IEC 60255-21-1)	
Application mode	Sinusoidal
Amplitude	0,074 mm (10…59 Hz) 1 G (59…150 Hz)
Duration	8 min/axis
DURABILITY TO VIBRATION (IEC 60255-21-1)	
Application mode	Sinusoidal
Amplitude	2G (10…150 Hz)
Duration	160 min/axis



SDG

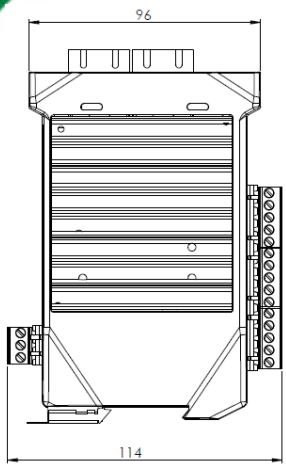
ⓘ For more details and product usage, consult user manual.

⏚ Connect the cable shield to ground at the same point of SDG grounding.

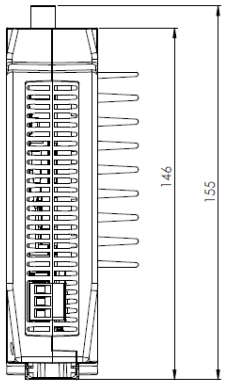
Connect only one end of the cable shield to a noiseless ground terminal.

ELECTRICAL DIAGRAM

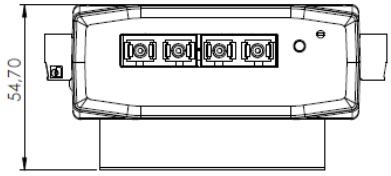
PRODUCT DIMENSIONAL



SIDE VIEW



BOTTOM VIEW



FRONT VIEW

ALL DIMENSIONS IN mm

PRODUCT FRONT

RECOMMENDED ACCESSORY

Sigma ECM® monitoring software

In addition to online monitoring of the temperature of your assets, with our monitoring system and our specialized team, it is possible to keep track of the status of your assets going beyond reading data.

Follow-up based on analysis of the information collected by the IEDs installed in your assets.

ORDER SPECIFICATION

In the product purchase order, it is necessary to specify:

- ✓ Product name:
- ✓ Quantity;
- ✓ Model;
- ✓ Optionals;
- ✓ Accessories.

Communication setup:

- ✓ **FO FO:** 2 Ethernet fiber optic;
- ✓ **FO SR:** 1 Ethernet fiber optic + 1 Serial fiber optic;
- ✓ **RJ-45:** 2 Ethernet RJ45.

Treetech

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See the list of our distributors at:

www.treetech.com.br/contato/representantes/