RENEWABLE ENERGIES

STM

Monitoring photovoltaic strings

Circutor

Photovoltaic generation

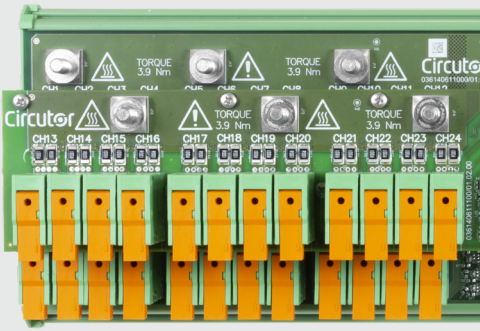
Climate change and global warming are a reality, and the only option we have to change this situation is to use efficient and sustainable energies that will keep our planet habitable for future generations.

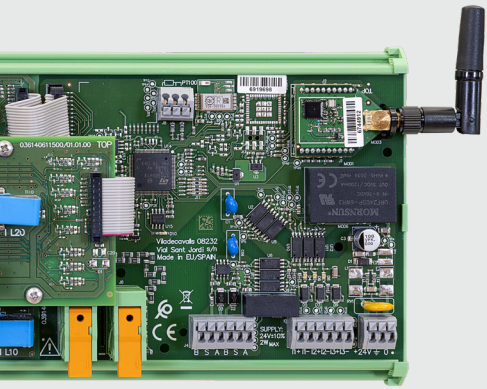
The goal is not just to promote renewable energies, but also to get the maximum efficiency from this kind of installation. As a result, we need systems that are capable of permanently monitoring, running and managing installations, and of interacting with all their components to ensure optimal performance.

Intelligent system for monitoring photovoltaic installations

STM

The **STM** is a monitoring device that can be easily adapted to the needs of the installation. Its capacity to monitor data and the ability to integrate it into any SCADA using wired or wireless communications make the **STM** the ideal device for managing the most important parameters of an installation.



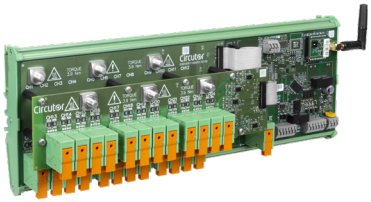


Everything you need for efficient management

In a traditional monitoring system, data is sent every second, which saturates communications with the SCADA that manages the photovoltaic farm; moreover, the alarms are programmed on the server and result from analyzing a large volume of data.

By incorporating the **STM** into the combiner boxes of the photovoltaic installation, we optimize communications by sending average current readings every 15 minutes (adjustable), thus significantly reducing the amount of data traffic.

Characteristics of the system



Shunt measuring system

STM-S
Analyzers for photovoltaic strings
with measurement via shunts

- Direct measurement via shunts, up to 30 or 45 A (depending on model)
- Models with 12 or 24 channels
- Self-powered by the DC converter: 1500 VDC to 24 VDC
- Wireless radio frequency communication at 868 or 915 MHz
- RS-485 communication (Mobus/RTU)
- Temperature measurement via Pt100 probe
- 3 digital inputs

STM-S12 | STM-S24

Hall effect measuring system

STM-H
Photovoltaic string analyzer with
measurement using Hall effect transformers

- Indirect measurement via hall effect transformers, up to 50 or 100 A (depending on model)
- Models with 6, 10 or 20 channels
- Self-powered from the DC converter: 1500 VDC to 24 VDC
- Wireless radio frequency communication at 868 or 915 MHz
- RS-485 communication (Mobus/RTU)
- Temperature measurement via Pt100 probe
- 3 digital inputs

STM-H6 | STM-H10 | STM-H20

Shunt measurement VS Hall effect measurement

Direct measure with shunt

This device has a zero-insertion input terminal where a string, or a combination of several strings, is connected to be measured. The measurement using the shunt ensures the best measurement accuracy. The maximum current is 45 A.

THE MOST ACCURATE MEASURE

Indirect measure with hall effect transformer

Thanks to the indirect measurement, the STM is able to measure the following range of currents without interrupting the electrical circuit:

- 10 or 20 channels up to 50 A
- 6 channels of up to 100 A.

PREVENTS INTERRUPTIONS

Compact

Robust
The new **STM** provides a compact way to integrate into a single device both the measuring elements, via shunt or Hall effect transformers, and the electronics for control and communications.

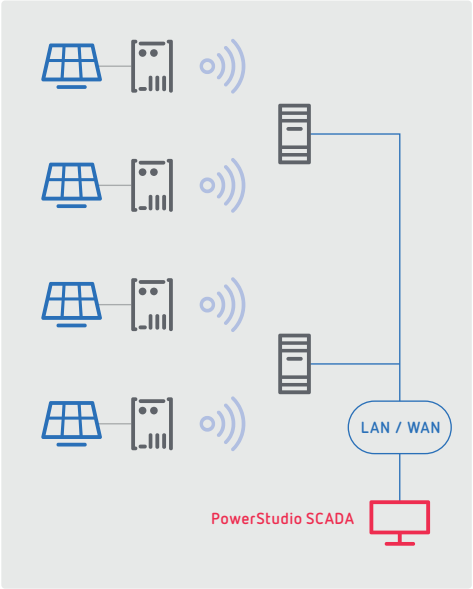
Smart

Integrated alarm management:
Reverse current (defective panel)
Low string performance (comparison of string currents). Automatic calculations of averages (RMS/adjustable): Voltage, current and power.

MyConfig

The **STM** system features wireless communications so it can be programmed in the field using a smartphone or tablet with the free-to-download **MyConfig** App.

This makes it possible to set up each **STM** quickly, easily and securely, and avoids having to use a portable computer in the field.



How STMs communicate

Wireless RF system

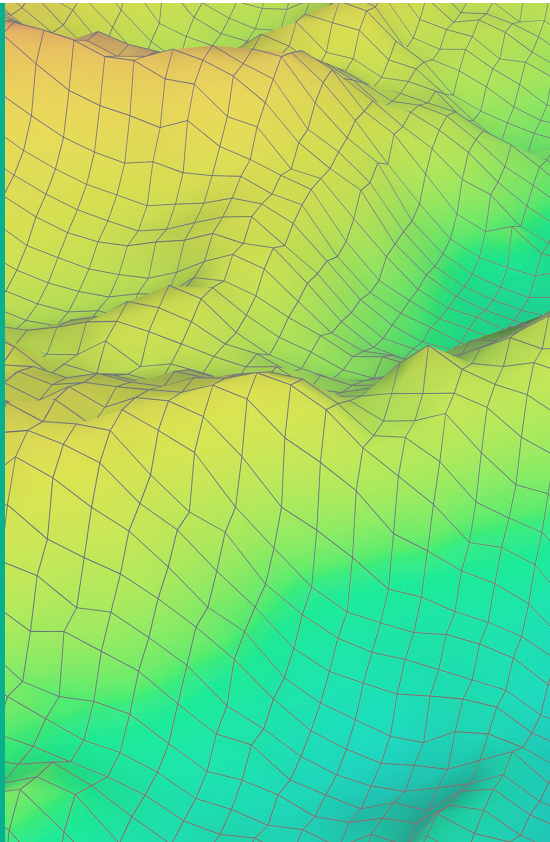
Wireless solution with RF communications. This type of communication uses a long-distance wireless data transmission technology (<15 km). Combined with string monitoring, it is the most efficient communication system on the market.

- **STM** with wireless comm. via RF system
- Long distances (<15 km)
- Compatible with generic Modbus software
- Compatible with RF-Ethernet with Ethernet port (Modbus-TCP)
- Compatible with SCADA software.

Value-added services

When commissioning STM devices, it is very important to consider the layout of the terrain. Because it communicates wirelessly using radio frequencies, you have to make sure that all the devices are visible to the management and control software. To make sure of this, a Ground Mapping process is conducted in the PV plant. This is a theoretical analysis of the RF communications in the field using computer tools that simulate the propagation of this type of signal.

Circutor offers an onsite commissioning service, where we deploy our communication specialists to identify the most viable way of communicating with our STM devices, and ensure proper communications between our devices and the monitoring system in the management centre.



RF communications accessories

To ensure the STMs communicate properly with the SCADA system for the farm, we have to install gateways. They send the information received from STM equipment in real time, via radio frequency, using the Modbus TCP protocol, to the SCADA software for the photovoltaic plant. The communications kit includes the enclosure, media converter and all the protections necessary to ensure its proper operation.

References

HALL EFFECT MEASUREMENT

Model	Code	Inputs	Current	Communications
STM-H6-485	**E85HA1.**	6	100 A	RS-485
STM-H6-F868	**E85HA3.**	6	100 A	868 MHz (radio)
STM-H6-F915	**E85HA4.**	6	100 A	915 MHz (radio)
STM-H10-485	**E85HB1.**	10	50 A	RS-485
STM-H10-F868	**E85HB3.**	10	50 A	868 MHz (radio)
STM-H10-F915	**E85HB4.**	10	50 A	915 MHz (radio)
STM-H20-485	**E85HD1.**	20	50 A	RS-485
STM-H20-F868	**E85HD3.**	20	50 A	868 MHz (radio)
STM-H20-F915	**E85HD4.**	20	50 A	915 MHz (radio)

SHUNT MEASUREMENT

Model	Code	Inputs	Current	Communications
STM-S-12-485	**E85SC1.**	12	45 A	RS-485
STM-S-12-F868	**E85SC3.**	12	45 A	868 MHz (radio)
STM-S-12-F915	**E85SC4.**	12	45 A	915 MHz (radio)
STM-S-24-485	**E85SE1.**	24	30 A	RS-485
STM-S-24-F868	**E85SE3.**	24	30 A	868 MHz (radio)
STM-S-24-F915	**E85SE4.**	24	30 A	915 MHz (radio)

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