

PV Fact Sheet

12 | Connecting the monitoring system into a protective earth

This fact sheet focuses on photovoltaic installations in solar parks worldwide. One essential part of such an installation is the PV combiner box. These boxes are used to combine several strings and to protect against overvoltage and feature many more functions.

Is it the GND (or C pin terminal) from the monitoring system an earthing point?

In Weidmüller history there has been different versions of monitoring system. In this article it will be about the most recent monitoring devices: the Transclenic and the Solar SMS. These devices have the same CN5 connectors for RS-485 connections:



Image 1. RS-485 connectors from a Transclenic



Image 2. RS-485 connectors from a Solar SMS

This configuration is the one that Weidmüller use to its monitoring devices based on the principle of the RS-485 connection, with a non-inverting pin (D+), inverting pin (D-), and a reference pin (C). However, the “C” pin is not an earthing point, is an internal reference (Vref), of the communication to regulate the voltages of signals A and B of RS-485 (D+ and D- respectively).

Is it possible to connect the monitoring system to a protective earth?

It is possible to connect the monitoring system into a protective earth, however, it can only connect the master devices and no other. The correct way to connect a monitoring system into a protective earth is by connecting the C terminal in the protective earth at the RS-485 master end.

If the C terminal is connected into an earth connection, a potential or voltage other than zero is introduced in the device and it could be damaged. If the C terminal if connected between two different earth point it will be generating a current loop due to the difference in potential between these two points, detrimental to the monitoring system. This applies to both monitoring devices (Transclenic and Solar SMS).

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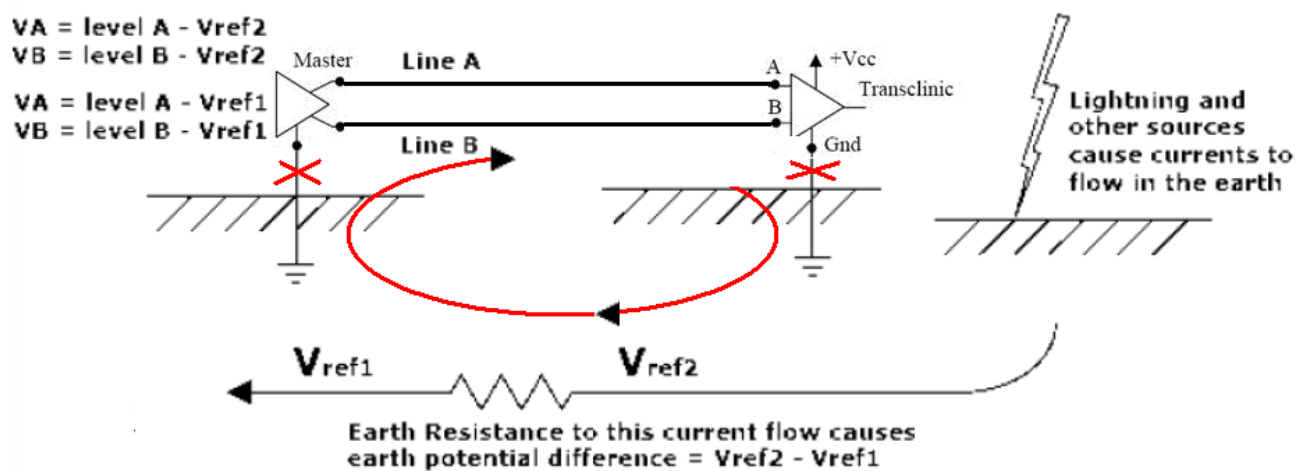


Image 3. Loop created by connecting 2 different devices into an earthing point.

Is there any recommendation for the connection of the Solar SMS Salves modules?

All variants of Solar SMS Slave use Modbus RTU protocol in “slave” mode, returning reading data (current measurements) to the “master” (the Solar SMS Master unit) when asked. The baud rate is fixed at 19200 bps (factory default).

All and each Solar SMS Slave (regardless the variant we do have) are internally connected as daisy-chain configuration to the Solar SMS Master unit and are equipped with a push-button (SW1) as can be seen in the image 4.

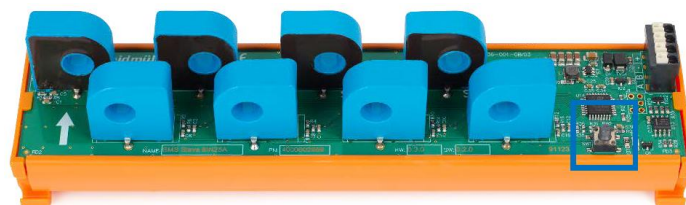


Image 4. Push button of the Solar SMS Salve module.

The push-button is meant to set the device address of each and all Solar SMS Slave daisy-chained to the Solar SMS Master unit. The push-button must be pressed in the desired order we do want to assign current channels order (8 up to 32). For doing so, a Modbus address must be given to each module and shown explained below:

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- Ensure that all Solar SMS Slave units are powered on.
- Shortly press the push-button of the first Solar SMS Slave unit to be configured to enter in “waiting address state” (green LED will blink slowly).
- The Solar SMS Master will send a broadcast message with the assigned address number.
- The Solar SMS Slave will save the address in the flash memory.
- The Solar SMS Slave Modbus address is configured and assigned to the unit.

Please repeat the process for all and each Solar SMS Slave daisy-chained to the Solar SMS Master unit.