

INGECON SUN STORAGE 3PLAY TL M

Technical guide for installations with
INGECON SUN STORAGE 3Play TL M

Table of contents

1 INGECON SUN STORAGE 3Play TL M 3

2 Types of installations 4

2.1 Self-consumption installations 4

2.2 Stand-alone installations 8

1 INGECON SUN STORAGE 3Play TL M

The INGECON® SUN STORAGE 3Play TL M hybrid inverter makes it possible to combine photovoltaic generation and energy storage with no need for any additional PV inverters.

Two or three MPPT system

This inverter features two or three maximum power point tracking (MPPT) system, that allows it to draw the maximum power from the PV array, including roofmounted installations with different orientations or with partial shading.

EMS Inside

The inverter is equipped as standard with an energy management system (EMS). The EMS permits more advanced functionalities, such as self-consumption. Thanks to the built-in EMS, the installation can be monitored at all times via a PC or mobile phone with the free INGECON®SUN Monitor application, available at Play Store and App Store.

Start-up and monitoring

Fast and easy start-up and display of data and graphics through the integrated user interface. Furthermore, users can easily upgrade the inverter firmware from the application, through a PC, tablet or mobile. The inverter is equipped by default with Wi-Fi and Ethernet communication.

PV + battery hybrid systems, grid-connected and stand-alone

This equipment can be used in the following type of installations:

- Self-Consumption installations
- Stand Alone installations

This document shows the recommended diagrams for these installations, as well as explanations related to each one.

The ISS 3Play TL M inverter doesn't allow for active poles (positive or negative) to be grounded in PV panels or batteries. It is compatible with TT, TN-C, TN-S and TN-C-S grounding system.



Figure 1: INGECON SUN STORAGE 3Play TL M

2 Types of installations

2.1 Self-consumption installations

A self-consumption installation is a system connected to the grid that seeks to minimize grid consumption and to increase self-supply. To do so, it is fitted with photovoltaic generation and storage components. The inverter has the possibility of operating just from the PV array and of adding the storage system at a later date.

An additional *Battery-Backup* function can be activated in this type of installation, to activate the *Battery-Backup* function it is necessary to have a battery bank or PV panels. It is needed the use of batteries to ensure the supply of the critical loads. The INGECON SUN photovoltaic inverter is disconnected to the grid and it doesn't supply energy. The non-critical loads are not fed. For TT installations, the inverter connects the neutral of the critical loads to ground through its internal grounding relay.

Installation components:

- Photovoltaic panels.
- Battery bank. Needed for *Battery-Backup*.
- ISS 3Play TL M inverter.
- External wattmeter. Check the "List of approved Power Meter for ISS 3Play TL M", available in the Ingeteam webpage. (In case of use the internal wattmeter of the inverter, consult the "Installation and Operation Manual" of ISS 3Play TL M, available in the Ingeteam webpage).
- INGECON SUN photovoltaic inverter (optional). To increase the photovoltaic power of the installation. Support with single-phase or three-phase solar inverters but does not support mixing them.
- Electric vehicle charger (optional). Consult the "List of EV chargers compatible with the ISS 3Play TL M", available on the Ingeteam webpage.

This inverter is equipped with the *AC Bypass* functionality, it is only available when the PV panels or the battery bank supply the inverter. With this functionality if the grid is available and the *Battery-Backup* function activated, in the event of an alarm or firmware update, the loads will be powered from the grid (*AC Bypass* closed). In case of manual stop, through the button of the inverter, the *AC Bypass* will be opened. The inverter must be supplied from the DC side, battery or PV.

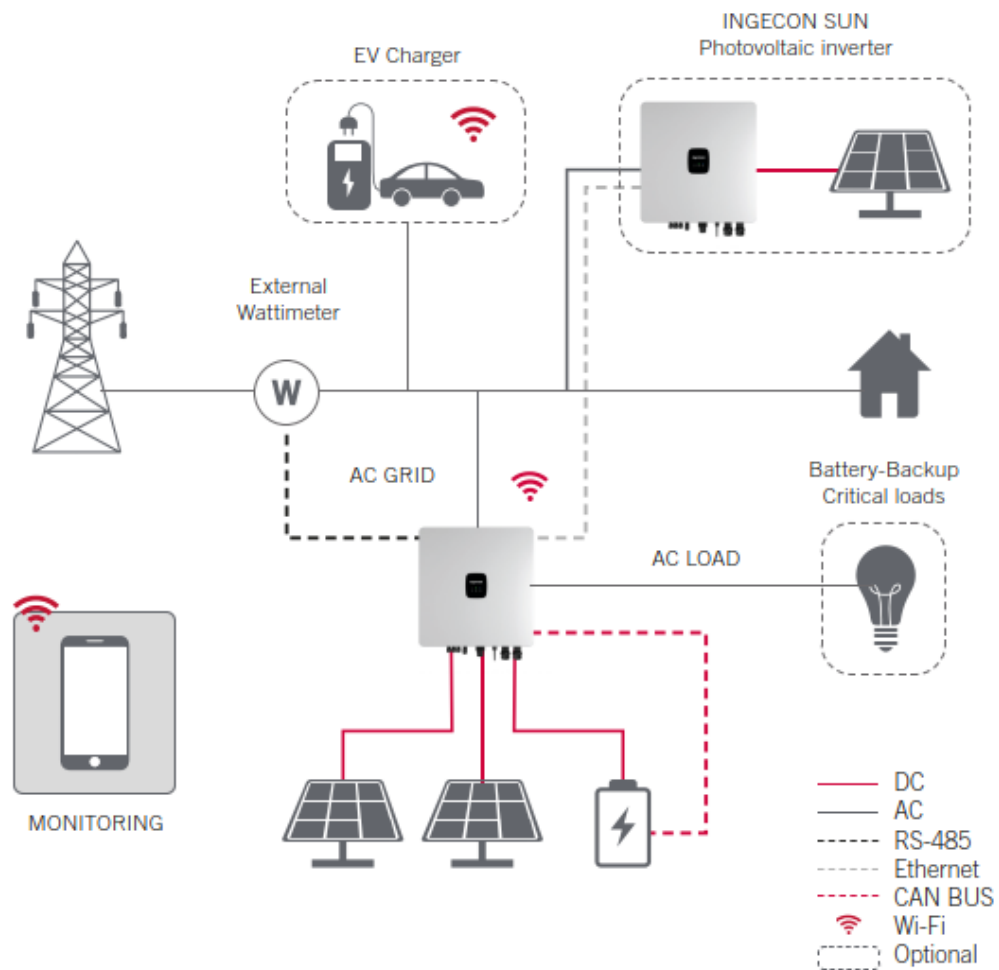


Figure 2: Self-consumption installation with three-phase solar inverter

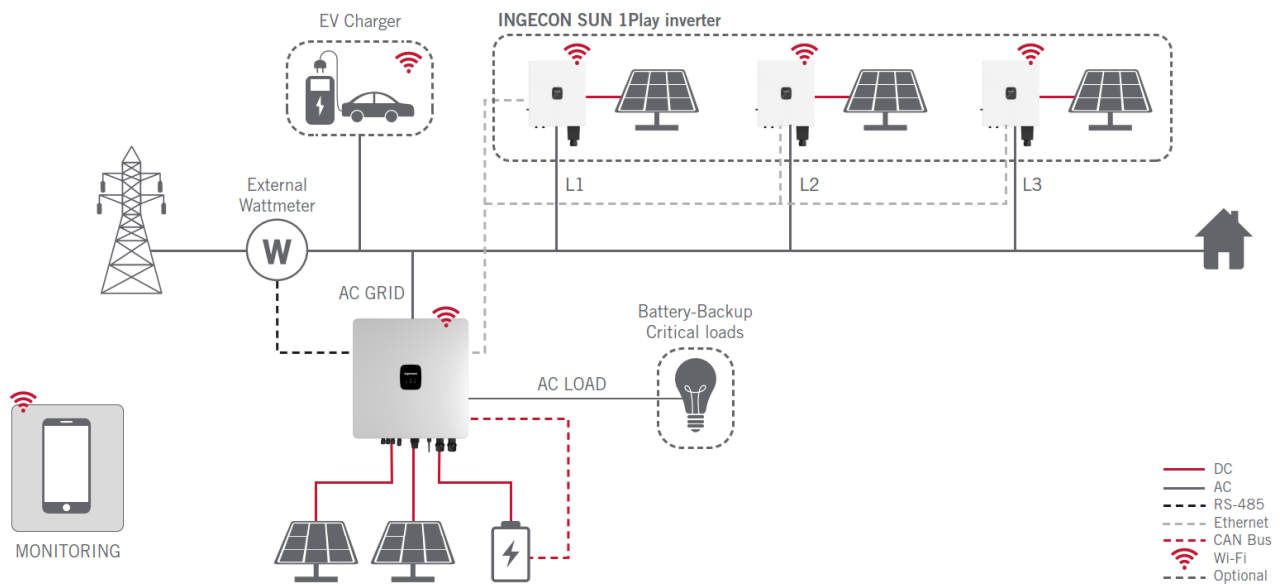
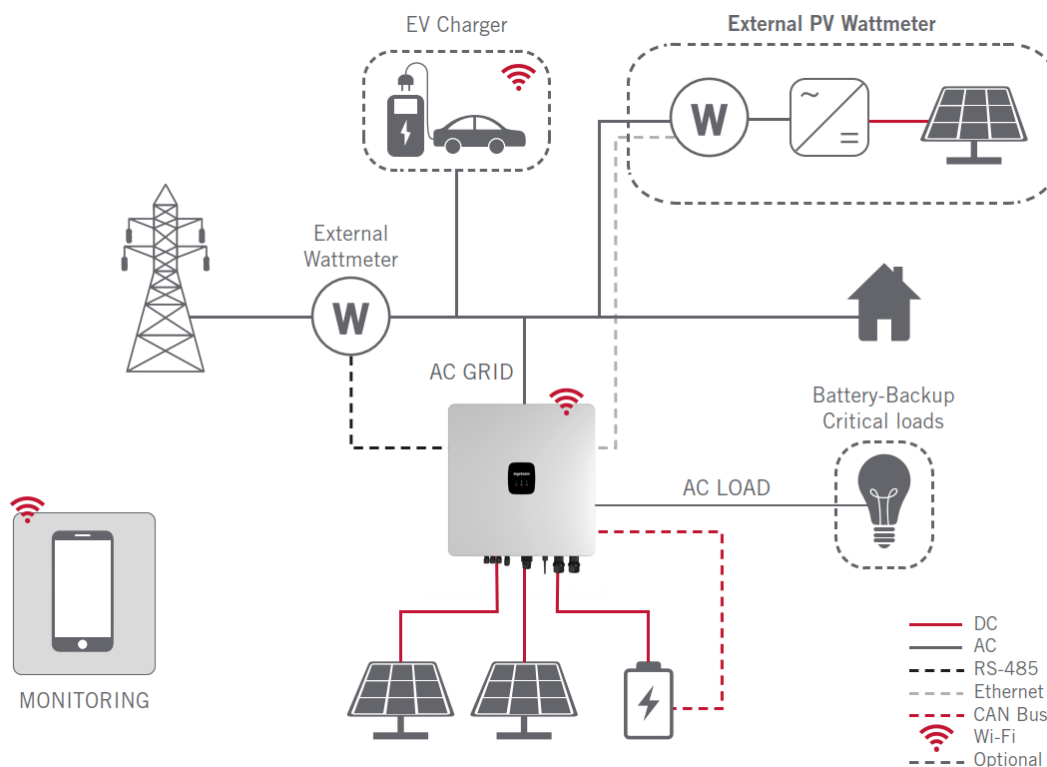


Figure 3: Self-consumption installation with single-phase solar inverters

External PV Wattmeter

In situations where a non-Ingeteam solar installation already exists and the ISS 3Play TL M is desired to be incorporated to manage the self-consumption installation with battery, it is possible to leverage the existing solar generation to charge the batteries and monitor it in conjunction with the ISS 3Play TL M.

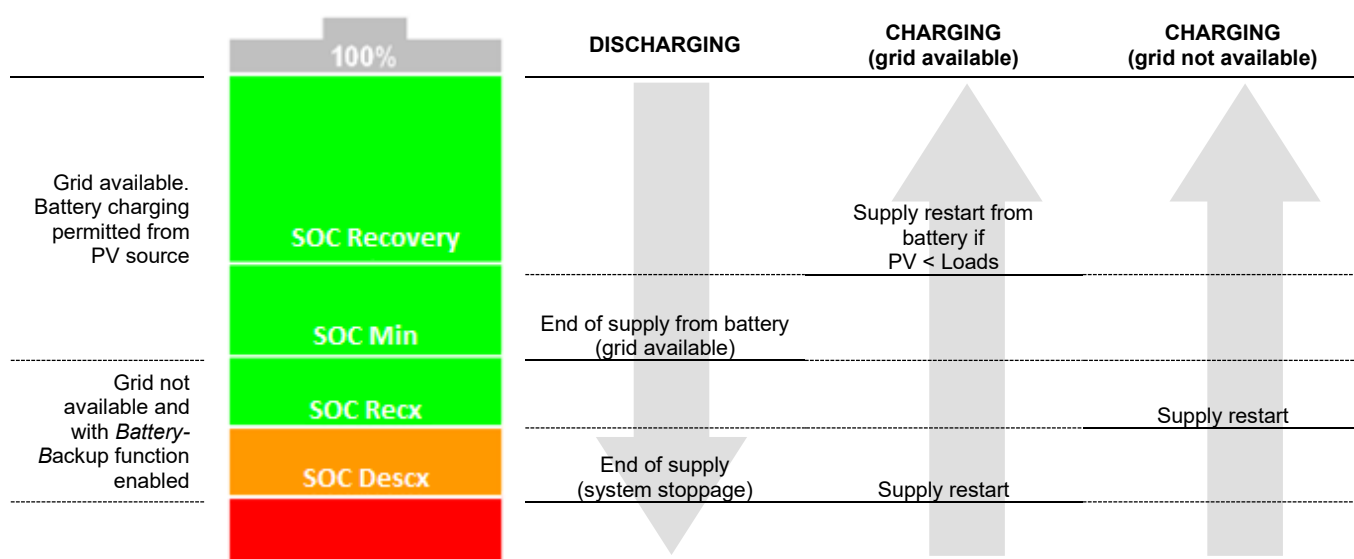
To do this, it is necessary to add a compatible meter to the non-Ingeteam solar installation that communicates via Ethernet with the ISS 3Play TL M.



Operating mode

The EMS of the ISS 3Play TL M manages the energy flows in the installation in line with the following principles:

- If the grid is available, it operates in the same manner as a self-consumption installation:
 - Photovoltaic energy is used as a priority to supply loads and to charge the battery. Grid supply of photovoltaic surplus is user configurable.
 - If the photovoltaic energy is insufficient to power loads, the battery provides the remainder.
 - If the sum of photovoltaic and battery energy is not enough to power the loads, the grid provides the remaining power.
 - Once the SOC Min value set by the user has been reached, the energy supply from the battery is not restarted until SOC Recovery is reached. This prevents excessive battery cycling, extending their working life.
 - The schedule for battery charging/discharging from the grid is user configurable.
 - The schedule for battery charging from the PV is user configurable. This allows the battery charge to be shifted during peak production hours photovoltaic and thus optimize the injection of surpluses into the grid.
 - Using an inverter compatible EV charger allows the user to configure from where you want to charge the car: only from photovoltaic or from the residential battery more photovoltaic.
- If the grid is not operational and the *Battery-Backup* function is activated, only the ISS 3Play TL M powers the critical loads until the battery is completely flat (SOC Descx). At this point, the critical loads are no longer powered until the grid is available once again or until SOC Recx is reached using photovoltaic energy of the ISS 3Play TL M. The INGECON SUN photovoltaic inverter is disconnected to the grid and it doesn't supply energy.



2.2 Stand-alone installations

A stand-alone installation is a system disconnected from the public grid that provides AC energy to a set of loads.

Installation components:

- Photovoltaic panels.
- Battery bank.
- ISS 3Play TL M inverter.
- Support diesel genset (optional) 11500W max, that is connected in the case of an energy deficit.

This inverter is equipped with the AC bypass functionality, it is only available when the PV panels or the battery bank supply the inverter. With this functionality if the diesel genset is available, in the event of an alarm or firmware update, the loads will be powered from the diesel genset (AC bypass closed). In case of manual stop of the inverter, the AC bypass will be opened.

Although the INGECON SUN STORAGE 3Play TL M provides an extra current during load connection transients such as motors, INGETEAM recommends the use of frequency drives with this type of load to avoid transient voltage drops (2-3 seconds) during their connection.

Technical notes:

- The power of the loads must under no circumstances be above the rated power of the inverter.

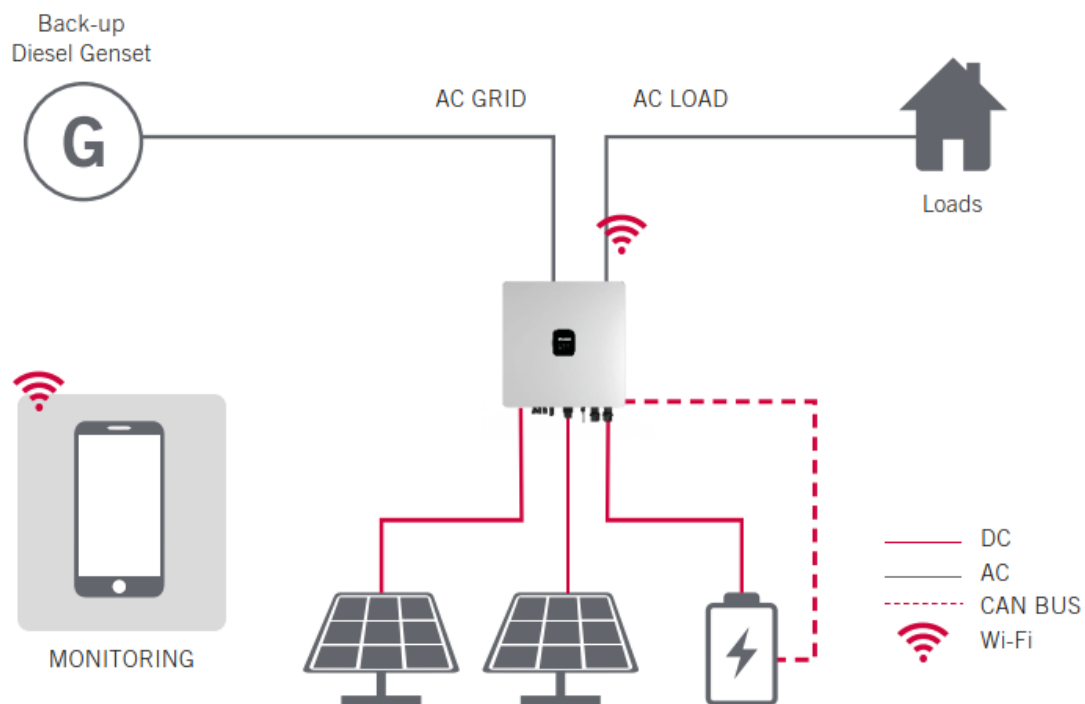


Figure 4: Stand-alone installation

Operating mode

The ISS 3Play TL M manages the energy flows in the installation in line with the following principles:

- Photovoltaic energy is used as a priority to supply loads and to charge the battery.
- If the photovoltaic energy is insufficient to power loads, the battery provides the remainder.
- If the state of charge (SOC) of the battery reaches a minimum value established by the user SOC On, the diesel genset will be connected. It will remain connected until the battery reaches the SOC Off.
- If the diesel genset is not operational, the ISS 3Play TL M powers loads until the battery is completely flat (SOC Descx). At this point, the loads are no longer powered until SOC Recx is reached using photovoltaic energy of the ISS 3Play TL M.

