

INGECON SUN STORAGE 1PLAY

Use and Settings of the ISS 1Play working only with PV

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1 Introduction

The INGECON SUN STORAGE 1Play (hereinafter, ISS 1Play) is a dual DC input (photovoltaic and battery) single-phase inverter capable of working in stand-alone or grid-connected modes. This equipment can be used in the following type of installations:

- Stand-alone installations
- UPS (back-up) installations
- Self-consumption installations

There are cases such as a battery failure or installing a battery bench time after the initial commissioning, where it could be interesting using this inverter working with its PV input as the only DC source.

This document describes the use and settings of the ISS 1Play working only with its photovoltaic DC Input

2 Use of the ISS 1 Play with PV as the only DC Source.

As explained in the introduction, it is possible to use the ISS 1Play with the PV array as the only DC source. The ISS 1Play is capable of converting the Maximum DC Power from the PV array into AC Power.

This grid injection could be limited with two different approaches:

- Using an external controller. In this particular case, the “Grid Support” operating mode should be selected.
- Internal power limitation. The ISS 1Play limits grid injection by selecting the “Self-Consumption” operating mode.

If the available PV power is greater than the power required by the loads, the surplus energy can be injected to the grid when the country’s grid regulation allows it.

Unlike a traditional PV inverter, the ISS 1Play offers the possibility to feed the loads when there is a grid blackout or when a Stand Alone installation needs to be created. To do so, the loads must be connected to the LOADS terminal. Obviously, the loads will be fed as long as the available PV power is greater than the power required by the loads.

In addition to that, when the inverter is meant to work in Stand Alone operating mode or in any other mode with back-up functionality enabled, additional inverters cannot be connected to the system.

3 Sizing and connection of the PV array.

The instructions to connect the PV array are described in the “Installation and Operation Manual”.

Please, take into account the following technical notes:

- The ISS 1Play does not allow grounding any active poles (positive or negative).
- The inverter will be able to obtain the Maximum Power out of the PV array only within the Maximum Power Point (MPP) range. Check this range in the “ISS 1Play Datasheet”, downloadable on www.ingeteam.com. Notice that this MPP voltage range is different and narrower when the inverter is connected to the grid.

4 Setting the inverter.

This chapter describes how to configure the inverter settings when using the ISS 1Play with its PV input as the only DC source.

To do so, the inverter must be switched on with DC power.

Minimum Firmware Version:

The minimum FW versions to work with the ISS 1Play without batteries are the following:

- Inverter: ABH1002_U
- Display: ABH1003_L

The FW versions can be found at the display or via the “Ingecon Sun Manager” software:

Using Ingecon Sun Manager:

The firmware version is indicated underneath the inverter node.

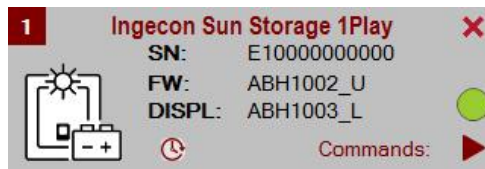


Figure 1: Inverter and Display FW versions of Node 1 shown on Ingecon Sun Manager.

Using Display:

MAIN MENU > MONITORING > FIRMWARE MONIT

For further details, check the “Installation and Operation Manual”.

In order to know the firmware version from the inverter or the display, the user should check the last two characters from the given firmware code. This two characters are arranged in alphabetical order.

For example, the firmware code ABH1002_T represents a T version, and the ABH1002AC code represents an AC version. In this particular case, the AC version is more updated than the T version.

The inverter and the display should be updated to the latest available firmware version that can be found at www.ingeteam.com.

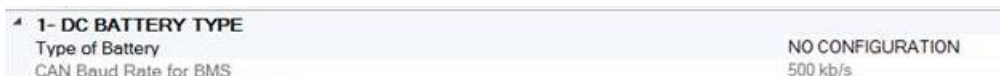
4.1 DC Source type

It is required to set the DC Source type in order to indicate the inverter that either the battery is not connected or that is no longer in use.

This can be done using the “Ingecon Sun Manager” software package (downloadable on www.ingetteam.com) or through the display:

Using Ingecon Sun Manager:

Settings → 1-.DC BATTERY TYPE: Type of Battery > NO CONFIGURATION.



1- DC BATTERY TYPE	
Type of Battery	NO CONFIGURATION
CAN Baud Rate for BMS	500 kb/s

Figure 2: DC Source selection on Ingecon Sun Manager.

Click on the “Send” button. A screen informing that the configuration was successfully saved must appear when the settings are correctly applied to the inverter.

Using Display:

To perform any configuration change through the display, the required installer password must be entered on:

MAIN MENU > CONFIGURATION > ENTER PASSWORD

The password is indicated on the “Installation and Operation Manual”, on the chapter dedicated to configuration.

When the permission is given, go to:

MAIN MENU > CONFIGURATION > BATTERY > NO CONFIGURATION

Confirm the desired selection by pressing the “OK” button. A message to confirm the modification will pop up. A final screen that shows that the process has been completed will be shown on the display.

4.2 Type of Operation Mode

Depending on the desired application for the ISS 1Play, several options are offered on the “Type of Operation Mode” when using only the PV input.

- Stand Alone: For Stand Alone installations. The ISS 1Play produces the grid itself and will power up the loads when possible.
- Self Consumption without EMS: Choose this option when the inverter is normally connected to the utility grid and there is no external controller (Ingecon EMS Board or any other) limiting AC Power injection.
The ISS 1Play will try to feed the power required by the loads using energy from the PV array. When there is PV energy surplus, this will be injected to the grid as long as it is below the “Maximum Power Injected to the Grid” parameter. Otherwise, PV energy will be limited and injection not permitted.
- Grid Support: Choose this option when the inverter is normally connected to the utility grid and there is an external controller (Ingecon EMS Board or any other) limiting AC Power Injection.
- UPS (Back-up): Although this operating mode is configurable on the inverter when only PV power is connected, this strategy is meant to manage systems with batteries.

For more details on the Operation Mode, check the “Technical Guide for Installations with Ingecon Sun Storage 1Play” document.

The type of operation mode can be set using the Ingecon Sun Manager Software or through the Display:

Using Ingecon Sun Manager:

Settings→ 6-.OPERATION MODE: Type of Operation Mode.

Click on the “Send” button. A screen informing that the configuration was successfully saved must appear when the settings are correctly applied to the inverter.

Using Display:

To perform any configuration change through the display, the required installer password must be entered on:

MAIN MENU > CONFIGURATION > ENTER PASSWORD

The password is indicated on the “Installation and Operation Manual”, on the chapter dedicated to configuration.

When permission is given, go to:

MAIN MENU > CONFIGURATION > OPERATION MODE > MODE

Confirm the desired selection by pressing the “OK” button. A message to confirm the modification will pop up. A final screen that shows that the process has been completed will be shown on the display.

4.2.1 Maximum Power Injected to the Grid

This parameter only applies to “Self Consumption without EMS” Operation Mode. For other types, skip this point.

This parameter allows injecting the PV surplus power to the grid. Set this parameter to “0 W” to avoid any injection to the grid, or to a negative value to enforce grid consumption prior to PV power. However, if the surplus PV power is wanted to be injected to the grid, increase this parameter up to the inverter’s maximum grid power.

This can be set using Ingecon Sun Manager Software or through the Display:

Using Ingecon Sun Manager:

Settings→ 6-.OPERATION MODE: Maximum power injected to the grid.

Click on the “Send” button. A screen informing that the configuration was successfully saved must appear when the settings are correctly applied to the inverter.

Using Display:

To perform any configuration change through the display, the required installer password must be entered on:

MAIN MENU > CONFIGURATION > ENTER PASSWORD

The password is indicated on the “Installation and Operation Manual”, on the chapter dedicated to configuration.

Once the permission is given, go to:

MAIN MENU > CONFIGURATION > OPERATION MODE > POWER INJECTED GRID

Change and confirm the desired “Grid Power” value by pressing the “OK” button. A message to confirm the modification will pop up. A final screen that shows that the process has been completed will be shown on the display.

4.3 Optional: Low PV Power Stop.

There is a functionality that can be enabled in order to switch off the inverter when the PV power is very low (night time). In these situations, the inverter could be consuming AC Power rather than injecting it to the grid to keep the inverter connected to the grid.

This energy consumed from the grid is very limited. However, due to the fact that the night lasts several hours it is recommended to enable this option not to consume energy when there is not an interest in keeping the inverter connected.

The default value of this parameter is “Disabled” and can be modified using the Ingecon Sun Manager and through the Display:

Using Ingecon Sun Manager:

Settings→ 6-.OPERATION MODE: Low PV Power Stop: Mode.

Click on the “Send” button. A screen informing that the configuration was successfully saved must appear when the settings are correctly applied to the inverter.

Using Display:

To perform any configuration change through the display, the required installer password must be entered on:

MAIN MENU > CONFIGURATION > ENTER PASSWORD

The password is indicated on the “Installation and Operation Manual”, on the chapter dedicated to configuration.

Once the permission is given, go to:

MENU > CONFIGURATION > OPERATION MODE > LOW PV POWER STOP

Confirm the desired selection by pressing the “OK” button. A message to confirm the modification will pop up. A final screen that shows that the process has been completed will be shown on the display.

5 Attachment I. References

Commercial codes for the products indicated:

- Installation and Operation Manual ABH2013
- ISS 1Play Datasheet Datasheet
- Ingecon Sun Manager Software ISS Manager
- Technical Guide for Installations with Ingecon Sun Storage 1Play ABH2010IMC04