Tech Document

How to connect SG ready heat pump to inverter?

1. Solution Introduction

Solinteg inverters have integrated the intelligent load management function, which can help customers to use their green power with their SG ready heat pump (HP) more efficiently. For better to use this function, we made this file to guide the connection and settings.

2. Inverter and Firmware Requirements

Now this function is only available on the following inverter models and firmware version:

Inverter models:

- MHS 3-8K
- MHT4-12K
- MHT10-20K
- MHT20-50K

Firmware version:

V01(22) or higher (For upgrading your firmware, please contact our after sales team.)

3. SG Ready and Work Modes Introduction

SG ready is a label issued by the German Heat Pump Association, in order to offer a flexible use of the HP. It requires that four different operation modes (as shown below) of the HP can be triggered via two zero voltage contacts. Solinteg inverters support switching between the most frequently used work modes 2 and 3, which is controlled by a normally open dry contact on multi-function connector (pin1 and pin2 in COM2).

Mode1: OFF (Contact status 1:0)

At this mode, the HP is turned off. And the operator can assigns a daily fixed off time of up two hours per day.

Mode2: Normal (Contact status 0:0)

HP operates in normal energy efficient mode and operates with normal set-points.

Mode3: Recommended ON (Contact status 0:1)

HP is operating in an enhanced heating mode for hot water generation or room heating. This is not a direct start-up command, but an activation recommendation corresponding to the surplus PV power or battery soc level.

Mode4: Forced ON (Contact status 1:1)

HP will be forced on and work in the following control modes:

4_a: HP is switched on, temperatures increased to max.

4_b: HP and back-up heater are switched on, temperatures increased to max.

4. Solinteg Intelligent Load Management Function Introduction

Disable

Before we use the function, we need to define the usage of the multi-function relay. Disable means not using the load management function.

Manual Mode

Manually control the heat pump operates between Mode2 and Mode3. (OFF correspond to Mode2, On correspond to Mode3.)

Smart Mode

A. Feed-in Power Control-- use in system WITHOUT power export limitation.

Set the feed-in power threshold for triggering the heat pump entering Mode3. When the meter detects the feed-in power equal to or greater than the set value, heat pump will enter heating mode or smart loads start working.

B. Battery SOC Control-- use in system WITH power export limitation.

Set the battery SOC threshold for triggering the heat pump entering Mode3. When inverter detects the battery SOC value equal to or greater than the set value, pump will enter heating mode or smart loads start working.

C. Time Control

Set the operation periods for heat pump switch between Mode2&3 according to user habits or preferences. Up to 3 periods can be set. When this mode is enabled, a higher priority than other modes within the period. Outside the period, the heat pump or smart load operates according to the parameters set by the smart mode.

5. Wire Connection

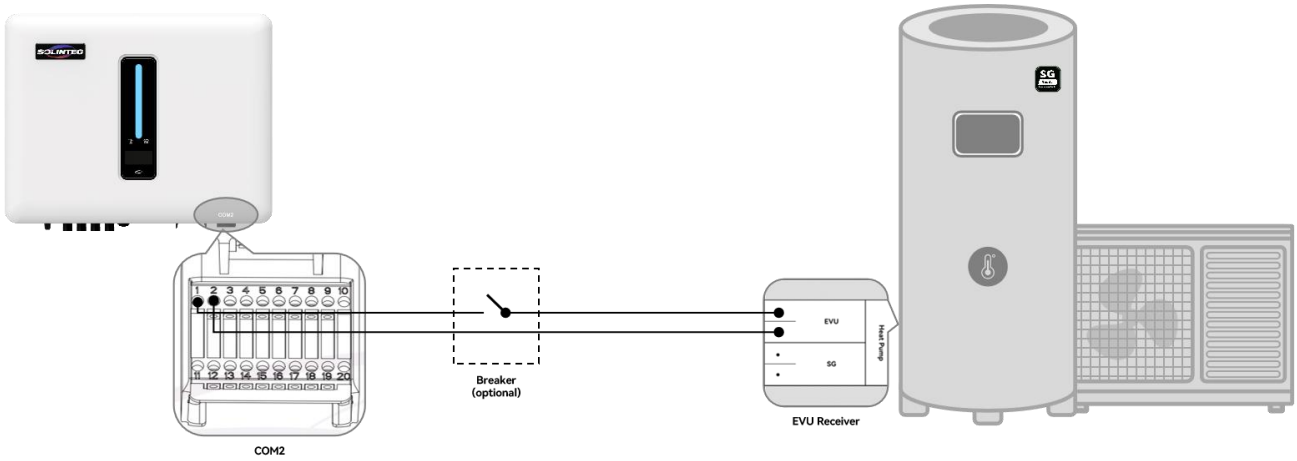
Most SG ready HP has integrated the contact for receiving EVU signal. Different EVU signals corresponding to different SG Ready HP working modes. Here we use a common case as an example:

Work Mode	Contact Status	
	SG	EVU
Mode1: OFF	●	○
Mode2: Normal	○	○
Mode3: Recommended ON	○	●
Mode4: Forced ON	●	●

○: OFF; ●: ON

⚠: Different HP manufacture may has different definition and name of the EVU contact, please consult the HP manufacture for detailed information and do the installation under their guide. Wrong connection may cause error and damage.

As Solinteg inverters support switching the HP between Mode2 and Mode3, we only need connect the EVU port of the heat pump to the multi-function relay in COM2 of the inverter. As the picture shown below:

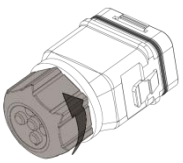
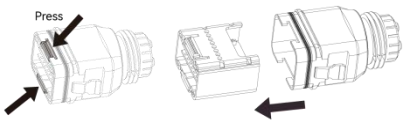
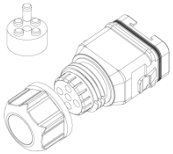


Wire Diagram of Inverter and SG Ready HP

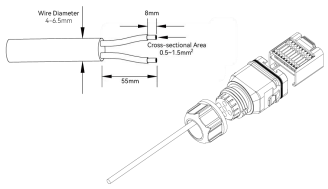
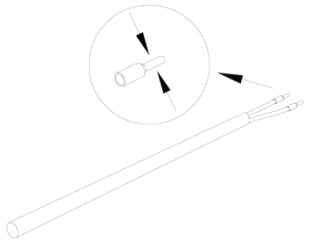
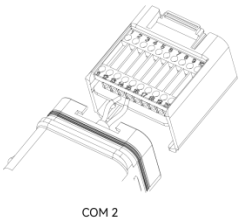
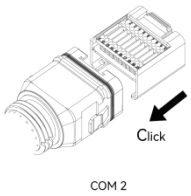
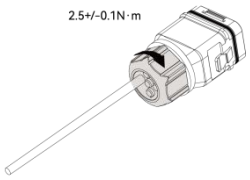
Pin	Definition	Function
METER (RJ45-1)	RS 485	Communicate with Meter
BMS (RJ45-1)	CAN	Communicate with BMS
1	COM	DO-1 (Multifunction Relay)
2	NO (Normally Open)	
3	/	Reserved
4	/	Reserved
5	DRM4/8	DRED For Australia and New Zealand RCR For Germany and some other European countries
6	DRM3/7	
7	DRM2/6	
8	DRM1/5	
15	COM D/0	
16	REF D/0	
11	Emergency stop +	Emergency stop
12	Emergency stop -	
13	485 B1	EMS
14	485 A1	
17	CANL_P	CAN for parallel connection of inverters
18	CANH_P	
19	/	Reserved
20	/	Reserved

COM2 Pins Definition

5.1 Assembling the Inverter COM2

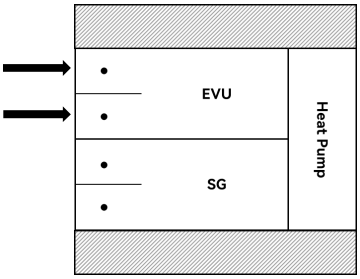
STEP 1	STEP 2	STEP 3
		
Unscrew the swivel nut from the connector.	Take out the terminal block.	Remove the seal and lead the cable through the cable gland.

5.2 Connect the Cables to Inverter

STEP 1	STEP 2	STEP 3
		
Thread the cable of appropriate length through the swivel nut and the housing. Remove the cable jacket and strip the wire insulation.	(Optional) When using a multi-core multi-strand copper wire cable, connect the AC wire head to the cord end terminal (hand-tight). In case of single-strand copper wire, skip this step.	Fix all the wires to the terminal plug according to the assignment and tighten to a torque of 1.2+/-0.1N·m with a screwdriver.
STEP 4	STEP 5	
		
Pull the wires outward to check whether they are firmly installed. Insert the terminal block into the connector until it snaps into place with an audible click.	Fasten the swivel nut.	

5.3 Connect the cables to Heat Pump

Find the EVU port in the HP connector, and connect the pilled wire into it. (If you can not find the relative connector, please consult the HP manufacturer.)



EVU Receiver of Heat Pump

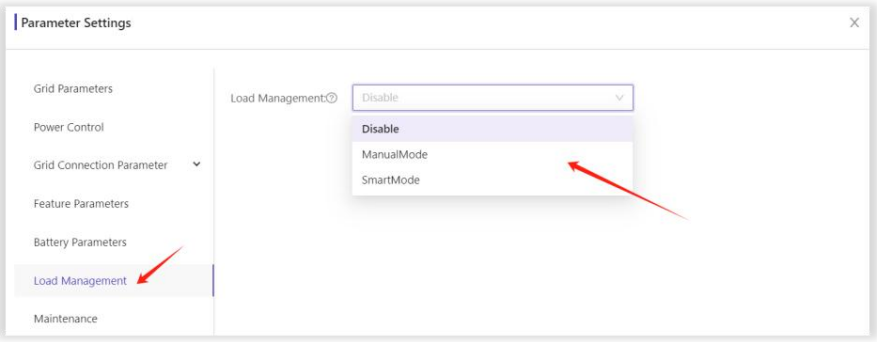
6. Inverter configuration

⚠: Before the configuration, please check other cable (power cable and ground cable) is properly and

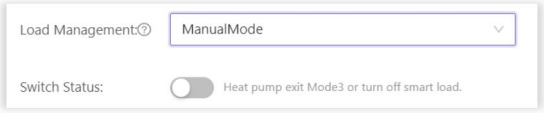
reliably connected, and make sure the SG ready function of heat pump is activated.

6.1 Solinteg Cloud Web Configuration

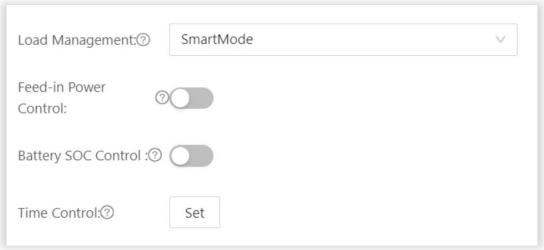
①Enable the function, choose the mode you want.



②Manual Mode: switching the HP between Mode2 and Mode3. (OFF: Mode2; ON: Mode3)

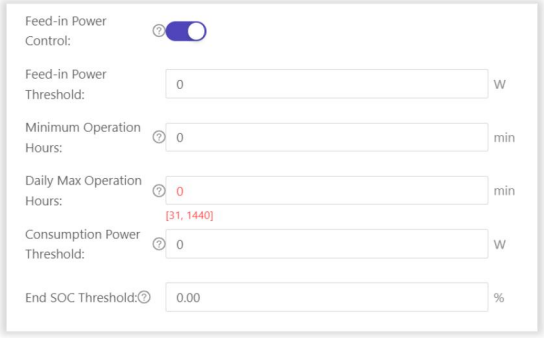


③Smart Mode: switching the HP according to different factors: feed-in power, battery SOC or time period. Only one of the three modes can be functional at the same time.



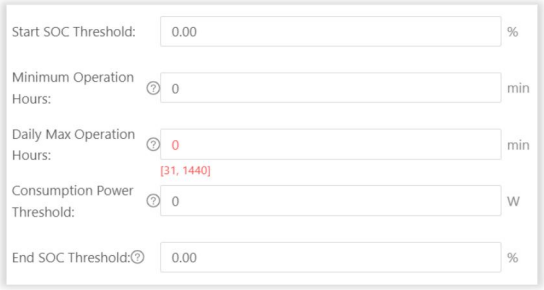
A: Feed-in Power Control

Suitable for the system without power export limitation.



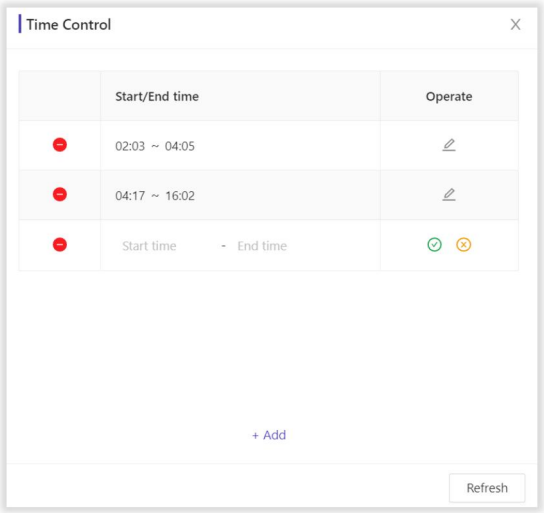
B: Battery SOC Control

Suitable for the system with power export limitation.



C: Time Control

Support up to 3 preset time periods.



6.2 Solinteg Cloud APP Configuration

Take the steps as before.