6. Operation

During normal operation, the display alternately shows the power and the operation status with each screen lasting for 10 seconds (see Figure 6.1). Screens can also be scrolled manually by pressing the UP and DOWN keys. Press the ENTER key to access to the Main Menu.

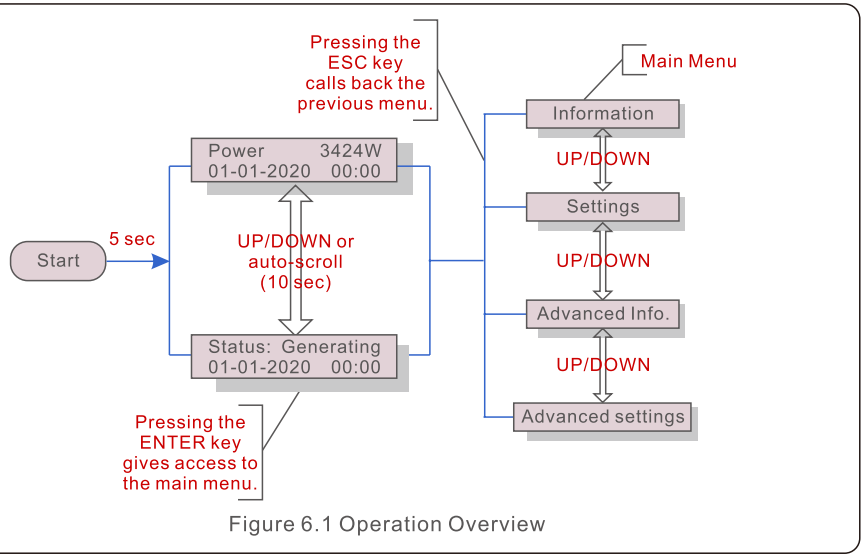


Figure 6.1 Operation Overview

6.1 Main Menu

There are four submenus in the Main Menu (see Figure 6.1):

1. **Information**
2. **Settings**
3. **Advanced Info.**
4. **Advanced Settings**

6.2 Information

The Solis S6 Mini Single Phase Inverter main menu provides access to operational data and information. The information is displayed by selecting "Information" from the menu and then by scrolling up or down.

Display	Duration	Description
V_DC1 350.8V I_DC1 5.1A	10 sec	V_DC1: Shows input 01 voltage value. I_DC1: Shows input 01 current value.
V_DC2 350.8V I_DC2 5.1A	10 sec	V_DC2: Shows input 02 voltage value. I_DC2: Shows input 02 current value.
V_Grid 230.4V I_Grid 8.1A	10 sec	V_Grid: Shows the grid's voltage value I_Grid: Shows the grid's current value.
Status: Generating Power: 1488W	10 sec	Status: Shows instant status of the Inverter. Power: Shows instant output power value.
Grid Frequency F_Grid 60.06Hz	10 sec	F_Grid: Shows the grid's frequency value.
Total Energy 0258458 kwh	10 sec	Total generated energy value.
This Month: 0123kwh Last Month: 0123kwh	10 sec	This Month: Total energy generated this month. Last Month: Total energy generated last month.
Today: 15.1kwh Yesterday: 13.5kwh	10 sec	Today: Total energy generated today. Yesterday: Total energy generated yesterday.
Inverter SN 00000000000000	10 sec	Display series number of the inverter.
Export_P: +0000W Export_I: 00.0A	10 sec	Power of ERM. Current of EPM.
Work Mode: NULL DRM Number: 08	10 sec	Work Mode: The work mode of inverter. DRM Number: Show the number 01-08.
Meter EnergyP 0000000. 00kWh	10 sec	Meter EnergyP: The active power.

Table 6.1 Information list

6.2.1 Lock screen

Pressing the ESC key returns to the Main Menu. Pressing the ENTER key locks (Figure 6.2(a)) or unlocks (Figure 6.2 (b)) the screen.



(a) (b)

Figure 6.2 Locks and Unlocks the Screen of LCD

6.3 Settings

The following submenus are displayed when the Settings menu is selected:

1.Set Time

2.Set Address

6.3.1 Set Time

This function allows time and date setting. When this function is selected, the LCD will display a screen as shown in Figure 6.3.



Figure 6.3 Set Time

Press the UP/DOWN keys to set time and data. Press the ENTER key to move from one digit to the next (from left to right). Press the ESC key to save the settings and return to the previous menu.

6.3.2 Set Address

This function is used to set the address when muti inverters are connected to single monitor.
The address number can be assigned from “01”to “99”.
The default address number of Solis S6 Mini Single Phase Inverter is “01”.



Figure 6.4 Set Address

Press the UP/DOWN keys to set the address. Press the ENTER key to save the settings. Press the ESC key to cancel the change and return to the previous menu.

6. Operation

6.4 Advanced Info - Technicians Only

NOTE:
To access to this area is for fully qualified and accredited technicians only.
Enter menu “Advanced Info.” and “Advanced settings” (need password).

Select “Advanced Info.” from the Main Menu. The screen will require the password as below:

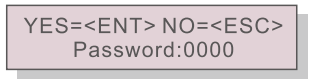


Figure 6.5 Enter password

The default password is “0010".
Please press “down” to move the cursor, press “up” to select the number.

After enter the correct password the Main Menu will display a screen and be able to access to the following information.

1.Alarm Message
2. Running message
3.Version
4. Daily Energy
5. Monthly Energy
6. Yearly Energy
7. Daily Record
8.Communication Data
9.Warning Message

6.4.1 Alarm Message

The display shows the 100 latest alarm messages. Screens can be scrolled manually by pressing the UP/ DOWN keys. Press the ESC key to return to the previous menu.

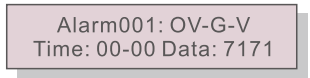


Figure 6.6 Alarm Message

6.4.2 Running Message

This function is for maintaince person to get running message such as internal temperature, Standard No.etc.
Screens can be scrolled manually by pressing the UP/DOWN keys.

6.4.3 Version

The screen shows the model version and the software version of the Inverter



Figure 6.7 Model Version and Software Version

6.4.4 Daily Energy

The function is for checking the energy generation for selected day.

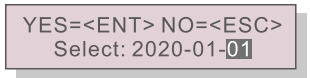


Figure 6.8 Select date for daily energy

Press DOWN key to move the cursor to day, month and year, press UP key to change the digit.
Press Enter after the date is fixed.

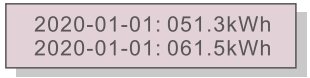


Figure 6.9 Daily energy

Press UP/DOWN key to move one date from another.

6.4.5 Monthly Energy

The function is for checking the energy generation for selected month.



Figure 6.10 Select month for monthly energy

Press DOWN key to move the cursor to day and month, press UP key to change the digit.
Press Enter after the date is fixed.

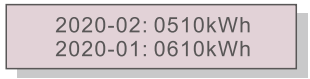


Figure 6.11 Month energy

Press UP/DOWN key to move one date from another.

6.4.6 Yearly Energy

The function is for checking the energy generation for selected year.



Figure 6.12 Select year for yearly energy

Press DOWN key to move the cursor to day and year, press UP key to change the digit.
Press Enter after the date is fixed.

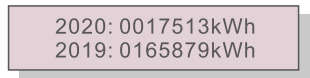


Figure 6.13 Yearly energy

Press UP/DOWN key to move one date from another.

6.4.7 Daily record

The screen shows history of changing settings. Only for maintance personel.

6.4.8 Communication Data

The screen shows the internal data of the Inverter (see Figure 6.14), which is for service technicians only.

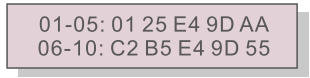


Figure 6.14 Communication Data

6.4.9 Warning Message

The display shows the 100 latest warn messages (see Figure 6.15). Screens can be scrolled manually by pressing the UP/ DOWN keys. Press the ESC key to return to the previous menu.

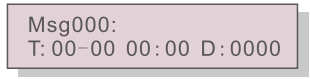


Figure 6.15 Warning Message

6.5 Advanced Settings - Technicians Only

NOTE:
To access to this area is for fully qualified and accredited technicians only. Please follow 6.4 to enter password to access this menu.

Select Advanced Settings from the Main Menu to access the following options:

1. **Select Standard**
2. **Grid ON/OFF**
3. **24H Switch**
4. **Clear Energy**
5. **Reset Password**
6. **Power Control**
7. **Calibrate Energy**
8. **Special Settings**
9. **STD. Mode Settings**
10. **Restore Settings**
11. **HMI Update**
12. **Internal EPM Set**
13. **External EPM Set**
14. **Restart HMI**
15. **Debug Parameter**
16. **DSP Update**
17. **Power Parameter**

6.5.1 Selecting Standard

This function is used to select the grid's reference standard (see Figure 6.16).

YES=<ENT> NO=<ESC>
Standard:AS4777-02

Figure 6.16

Press the UP/DOWN keys to select the standard (AS4777-02,AS4777-15, VDE4105, VDE0126, UL-240V-A, UL-208V-A, UL-240V, UL-208V, MEX-CFE, G83/2 (for 1-3.6kW models), G59/3 (for 4-5kW models), C10/11, EN50438 DK, EN50438 IE, EN50438 NL and “User-Def” function).

NOTE:
This function is for technicians use only.

NOTE:
For different countries, the grid standard needs to be set as different according to local requirements. If there is any doubt, please consult Solis service technicians for details.

Selecting the “User-Def” menu will access to the following submenu (see Figure 6.17),

– OV-G-V1: 260V
OV-G-V1-T: 1S

Figure 6.17

NOTE:
The " User-Def" function can be only used by the service engineer and must be allowed by the local energy supplier.

Below is the setting range for “User-Def”.
Using this function, the limits can be changed manually.

OV-G-V1: 176---290V	OV-G-F1: 50.1-65Hz
OV-G-V1-T: 0.01---600S	OV-G-F1-T: 0.01---600S
OV-G-V2: 176---290V	OV-G-F2: 50.1-65Hz
OV-G-V2-T: 0.01---600S	OV-G-F2-T: 0.01---600S
UN-G-V1: 110---220V	UN-G-F1: 45-59.9Hz
UN-G-V1-T: 0.01---600S	UN-G-F1-T: 0.01---600S
UN-G-V2: 110---220V	UN-G-F2: 45-59.9Hz
UN-G-V2-T: 0.01---600S	UN-G-F2-T: 0.01---600S
Startup-T: 10-600S	Restore-T: 10-600S

Table 6.2 Setting ranges for User-Def (L-N)

6.5.2 Grid ON/OFF

This function is used to start up or stop the power generation of Solis Single Phase Inverter.

– Grid ON
Grid OFF

Figure 6.18 Set Grid ON/OFF

Screens can be scrolled manually by pressing the UP/DOWN keys. Press the ENTER key to save the setting. Press the ESC key to return to the previous menu.

6.5.3 24H Switch

This function controls the 24H hours consumption function enable or disable.



Figure 6.19 Set 24H ON/OFF

NOTE:
When this is enabled, the inverter LCD will still be alive at night with the power LED light on. If the grid is in malfunction at night, the system can't recover even after the grid is back to normal but the consumption data will still be recorded in the meter. Until the sunrise, the system will start to work again while the meter data can be uploaded to the Solis monitoring system to calibrate the load consumption data.

6.5.4 Clear Energy

Clear Energy can reset the history yield of inverter.

These two functions are applicable by maintenance personnel only, wrong operation will prevent the inverter from working properly.

6.5.5 Reset Password

This function is used to set the new password for menu "Advanced info." and "Advanced information" (see Figure 6.20).



Figure 6.20 Set new password

Enter the right password before set new password. Press the DOWN key to move the cursor, Press the UP key to revise the value. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.

6.5.6 Power control

Active and reactive power can be set through power setting button.
There are 5 item for this sub menu:

1. Set output power
2. Set Reactive Power
3. Out_P With Restore
4. Rea_P With Restore
5. Select PF Curve

This function is applicable by maintenance personnel only, wrong operation will prevent the inverter from reaching maximum power.

6.5.7 Calibrate Energy

Maintenance or replacement could clear or cause a different value of total energy. Use this function could allow user to revise the value of total energy to the same value as before. If the monitoring website is used the data will be synchronous with this setting automatically.

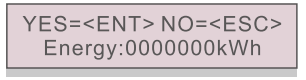


Figure 6.21 Calibrate energy

Press the DOWN key to move the cursor, Press the UP key to revise the value. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.

6.5.8 Special Settings

This function is applicable by maintenance personnel only, wrong operation will prevent the inverter from working properly.

6.5.9 STD Mode settings

There are 5 setting under STD. Mode settings.

1. Working mode
2. Power Rate limit
3. Freq. Derate set
4. 10mins OV-G-V set.
5. Initial Settings

This function is applicable by maintenance personnel only, wrong operation will prevent the inverter from reaching maximum power.

Please follow below settings to enable the **DRM**. DRM default setting is “OFF” , if DRM set “ON”, but the logic interface un-connected to the switch or the switch is open, the inverter HMI will display “Limit by DRM” and the inverter output power will be limited to zero.

1. Select **Initial Settings**
2. Select **DRM** and set it **“ON”**

6.5.10 Restore Settings

Restore setting could set all item in 6.5.8 special setting to default.
The screen shows as below:



Figure 6.22 Restore Settings

Press the Enter key to save the setting after setting grid off.
Press the ESC key to return the previous mean.

6.5.11 HMI Update

This function is used for updating the LCD program.

This function is applicable by maintenance personnel only, wrong operation will prevent the inverter from reaching maximum power.

6.5.12 Internal EPM Set

NOTE:

This section includes two functions related to the smart meter or smart sensor. Please refer to section 4.3.7 or 4.3.8 for detailed connection diagrams.

Function 1: Internal Export Power Management Function
Inverters can work with a smart meter OR a smart sensor to dynamically limit the export power of the system. Zero injection can be achieved.
Smart meter can be installed either on the grid side OR the load side.
Smart sensor can only be installed on the grid side.

Function 2: 24 Hour Consumption Monitoring Function
Only applicable if Solis monitoring system is used.
Inverters can work with a smart meter to monitor the load consumption data for the whole day and the data will be displayed on the Solis monitoring system.
Smart meter can only be installed on the grid side.

NOTE:

Please refer to below instructions for different user scenarios.
Scenario 1. Only Function 1 is required
Using a Smart Meter:
Step 1: Refer to Section 4.3.7 to connect the smart meter on the grid side or load side.
Step 2: Select the corresponding meter model in Section 6.5.12.4
Step 3: Select the Section 6.5.12.1 Mode Select as Option 2(Meter in Load) or Option 3 (Meter in Grid) accordingly.
Step 4: Configure the Section 6.5.12.2 to set the allowed backflow power.
Step 5: Configure the Section 6.5.12.3 to enable the failsafe function (If necessary).

Using a Smart Sensor:
Step 1: Refer to Section 4.3.8 to connect the smart sensor on the grid side.
Step 2: Select the Section 6.5.12.1 Mode Select as Option 5(Current Sensor).
Step 3: Configure the "CT Sampling Ratio" and "CT Link Test" if necessary.
Step 4: Configure the Section 6.5.12.2 to set the allowed backflow power.
Step 5: Configure the Section 6.5.12.3 to enable the failsafe function (If necessary).

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Scenario 2. Both Function 1 and 2 are required

Using a Smart Meter:

Step 1: Refer to Section 4.3.7 to connect the smart meter on the grid side.

Step 2: Select the corresponding meter model in Section 6.5.12.4

Step 3: Select the Section 6.5.11.1 Mode Select as Option 3(Meter in Grid).

Step 4: Select the Section 6.5.3 24H Switch as "Enable".

Step 5: Configure the Section 6.5.11.2 to set the allowed backflow power.

Step 6: Configure the Section 6.5.11.3 to enable the failsafe function (If necessary).

Step 7: Configure the Solis monitoring system (Please refer to the manual of monitoring device)

If customer does not want to enable the export power control function, please change the "backflow power" to the max output power of the inverter in Step 5 OR simply select the mode as "consumption monitor" in Step 3 and skip Step 5-6.

Select EPM Settings from the Main Menu to access the following options:

1. Mode Select
2. Set Backflow Power
3. Fail safe ON/OFF
4. Meter Select

6.5.12.1 Mode Select

There are 5 settings in this menu as below:

1. EPM OFF
2. Meter in Load
3. Meter in Grid
4.Consumption Monitor
5. Current sensor

EPM OFF: Functions are disabled
Meter in Load: Solis Smart Meter is connected in the load branch circuit.
Meter in Grid: Solis Smart Meter is connected in the grid connection point (The backflow power is default as 0W).
Consumption Monitor: Solis Smart Meter is connected in the grid connection point (The backflow power setting is not applicable).
Current sensor: Solis Smart Sensor is connected in the grid connection poin.

NOTE:

For option 5 (Current sensor), there are several sub-settings available when "Current sensor" is selected.

・CT Sampling Ratio

This setting is used to define the CT sampling ratio if customer didn't use the default CT supplied by Solis.

The default CT is 100A:33.33mA (Default ratio is 3000:1)

-> CT Sampling Ratio	YES=<ENT> NO=<ESC> Ratio:3000:1

・CT Link Test

This setting is used to check the direction of the CT (Not complusory)

The result is only valid if the following conditions are met.

1. Load power is over 500W.
2. Inverter is set as "Grid OFF" in the LCD.
3. CT is connected to the inverter CT port and the CT is placed at the grid side.

CT Link State Correct

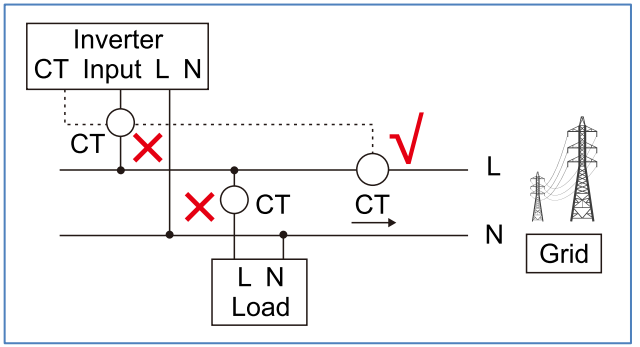
NOTE:

There are 3 states in the CT Link Test

"Error" means the CT is installed in the wrong direction, please change it.

"Can not judge" means the load power is too small and the result is not credible.

"Correct" means the CT is installed correctly.



6.5.12.2 Backflow Power

The setting is used to define the allowed export power into the grid.

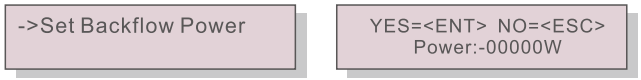


Figure 6.23 Set the backflow power

NOTE:
Positive values indicate the amount of power is allowed to export to the grid.
Negative values indicate a more strict control to limit the export power in advance thus ensuring exact no power is feeding into the grid.

6.5.12.3 Fail safe ON/OFF

This setting is used to give out an alarm (stop inverter generation as well) when the CT/Meter connection is lost during operation.
It can prevent potential backflow power into the grid when the system loses control.



Figure 6.24 Set the Fail Safe ON/OFF

It is only mandatory to turn on this function when the inverter is installed in UK due to the G100 regulation. For other regions,customers can enable or disable the function as they desire.

NOTE:
When the failsafe function is ON and CT/Meter is disconnected somehow, the inverter will stop generation and give "Failsafe" alarm on the LCD.
When the failsafe function is OFF and CT/Meter is disconnected somehow, the inverter will keep the output power as the last moment when the CT/Meter is still connected. After a restart, the inverter will output at full power without limit.

6.5.12.4 Meter Select

The setting is used to define the correct meter that is connected to the inverter.

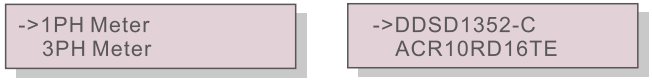


Figure 6.25 Meter Select

For Solis single phase inverters, please select "1PH Meter" and then select the corresponding meter model.

6.5.13 External EPM Set

This setting should only be turned on when Solis external EPM device is used.
Two options are available：5G-EPM and Others-EPM.

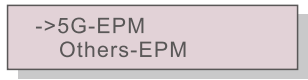


Figure 6.26

5G-EPM Failsafe Option should be turned ON when 5G series EPM device is used
Others-EPM Failsafe Option should be turned ON when 2G series EPM device is used
Only one option can be activated each time.

6.5.14 Restart HMI

The function is used for restart the HMI.

This function is applicable by maintenance personnel only, wrong operation will prevent the inverter from reaching maximum power.

6.5.15 Debug Parameter

This function is used for manufacturer maintenance personnel only.

6.5.16 DSP Update

The function is used for update the DSP.

This function is applicable by maintenance personnel only, wrong operation will prevent the inverter from reaching maximum power.

6.5.17 Power Parameter

This function is used for calibrate inverter output energy. It will not impact the energy count for inverter with RGM.
The screen shows:



Figure 6.27 Power Rate Limit

Press the Down key to move the cursor.
Press the Up key to change the digit.
Please press the Enter to save the setting and press the ESC key to return to the previous menu.

This setting is used for grid operator, don't change setting under this manual.

6.6 AFCI function

Solis inverters have the built-in AFCI function which can detect the arc fault on the DC circuit and shut down the inverter to prevent a fire disaster.

6.6.1 Enable the AFCI function

The AFCI function can be enabled in the following.
Path:
Advanced Setting -> Password: 0010 ->Special Settings -> AFCI Set -> AFCI ON/OFF -> ON

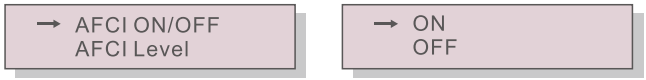


Figure 6.28 Set AFCI

6. Operation

Warning:
The "AFCI Level" is reserved for Solis technicians ONLY. Do not change the sensitivity otherwise it will lead to frequent false alarms or malfunctions. Solis is not responsible for any further damages caused by unauthorized modifications.

NOTE:
The setting corresponds to the current status as well which can be used to inspect the ON/OFF state of the AFCI function.

6.6.2 Arc Fault

During the normal operation, if an DC arc is detected, the inverter will shut down and give out the following alarm:



Figure 6.29 Arc Fault

Installer needs to thoroughly inspect the DC circuit to ensure all the cables are correctly fastened.
Once the DC circuit issue has been fixed or it is confirmed to be OK, press “ESC” for 3s and wait for the inverter to restart.