

Commissioning 7

7.1 Commissioning the WIT Inverter

	• The WIT Inverter might show wrong time and date if it has been stored for over a month. You need to set the correct time and date before connecting the WIT Inverter to the grid.
 WARNING	• When The WIT is only connected to the battery, the battery switch must be pressed until the battery is fully awakened.

7.1.1 Set the Communication Address

After the WIT Inverter is powered on, you can set the communication address of the WIT Inverter via RS485 communication or the USB to WiLAN-X2 module. When multiple inverters are connected in parallel with RS485 hand-in-hand communication, each inverter should be set to different communication addresses. For a single inverter, the default communication address is set to 1.

NOTE:

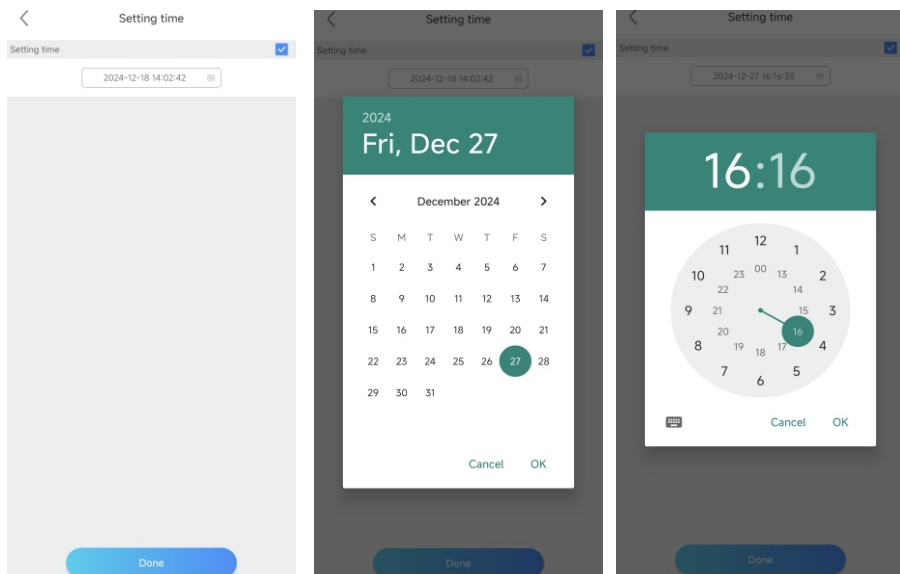
The communication address of the WIT Inverter ranges from 1 to 254. By connecting the WIT Inverter to the host computer through RS485 communication, you can change its communication address via Shinebus. This operation should be performed by professional personnel.

7.1.2 Set the Time and Date

7.1.2.1 Set the time and date on the APP (Shinephone/Shinertools)

Follow the instructions in Section 6.6.3 to connect the datalogger. Take Shinephone APP as an example, When the inverter is powered in, you can set inverter time and date referring to Section 8.1.1. Tap Control > Set Inverter Time, then enter the password "growatt+date". For instance, if the date is Feb. 28, 2024, the password would be "growatt20240228". After that, tap "Yes".

1. Set the correct date, then tap "OK". Proceed to set the time, and tap "OK".



7.1.2.2 Set the Date & Time Automatically

Connect the WIT Inverter to the server following the procedure specified in Section 8.1.2 when the inverter is powered on, then the WIT Inverter will update its date and time automatically.

7.2 Mode of operation

7.2.1 Waiting Mode

When the PV voltage is greater than 150V, the WIT Inverter will be powered on and enters the waiting mode.

In waiting mode, the WIT Inverter performs self-check. If the system is normal and the voltage is greater than or equals to 165V, the WIT Inverter will be powered on.

7.2.2 Operating Mode

7.2.2.1 Operating Mode of WIT 4-15K-HU

>Load First:

In Load First mode, the WIT inverter prioritizes supplying the solar power and battery energy to the loads. If Export Limitation is disabled, the surplus solar power can be fed to the grid, but the battery energy will not be exported to the grid; if Export Limitation is enabled, neither solar power nor battery energy would be sent to the grid.

Priority of power supplied to the loads:

1. Solar panels;
2. Batteries;
3. Grid.

NOTE: In Load First mode, one meter or three CTs are required.

>Battery First:

In Battery First mode, the solar power is prioritized towards charging the battery until the battery SOC (state of charge) reaches the preset upper threshold. Then it will supply power to the loads. The further excess solar power, if any, can be fed to the grid (Export Limitation disabled). In case that the solar power is insufficient, the WIT inverter will draw power from the grid to charge the battery or supply the loads.

Priority of power directed to charge the battery:

1. Solar panels;
2. Grid.

>Grid First:

In Grid First mode, the WIT inverter prioritizes supplying the solar power to the loads, exports the excess solar power to the grid, and sends the further surplus power to charge the power. If the solar power is insufficient to support the loads, the battery will discharge to supply power to the loads and the surplus battery power will be sent to the grid for revenue.

Priority of power supplied to the loads:

1. Solar panels;
2. Batteries;
3. Grid.

>Solar only backup

In Solar only backup mode, the grid cannot charge the battery, the solar power is prioritizes charging the battery until the SOC of the battery reaches the preset upper threshold, the excess power of solar supplies power to the load. If the excess power of solar is not enough to supply the load, the grid will supplement the power to the load; if the excess power of the solar is greater than the load, the excess power will be exported to the grid(Export Limitation disabled). In Off-grid mode, the PV and battery supply power to the load.

Priority of load power supply:

1. Solar;
2. Grid(On-grid);
3. Battery(Off-grid).

>Idle/Charge from clipped solar

In Idle mode, when the solar power is greater the load, the solar supplies power to load first, and the excess power will be exported to the grid(Export Limitation disabled); when the solar power is less than load, the solar and the grid supply the load together. In this mode, the battery is neither charged nor discharged. In Off-grid mode. if the PV power exceeds the load, the excess PV power will charge the battery.

Priority of load power supply:

1. Solar;
2. Grid(On-grid);
3. Battery(Off-grid).

>PTO

In PTO mode, PV is only used to charge the battery, and the grid can supply power to the load through the bypass. In this mode, there is no energy interaction between DC and AC.

> Grid first(ECO)

In ECO mode, the solar and the battery prioritize the power to meet the load demand, the excess power of the solar will be exported to the grid(Export Limitation disabled), and if there is excess power, it will charge the battery. If the excess power of the solar is not enough to supply the load, the battery will supplement the power to the load. The excess energy of the battery will not be exported to the grid.

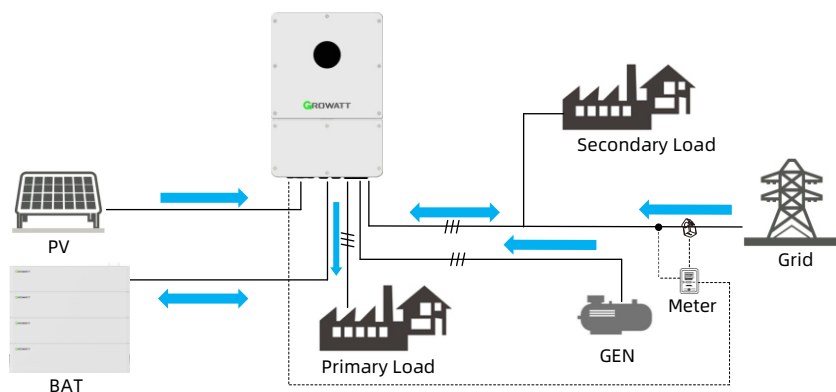
Priority of load power supply:

1. Solar;
2. Battery;
3. Grid.

Zero export to meter(or three external CTs):

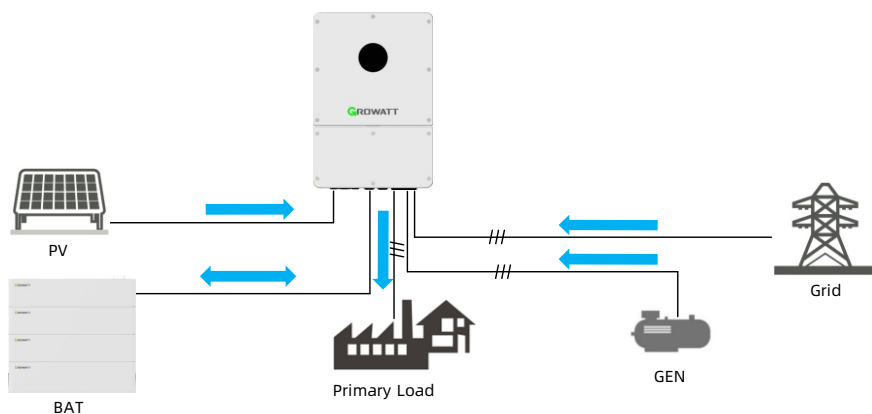
With Export Limitation enabled, no solar power or battery energy will be fed to the grid in this mode. The inverter output is only supplied to the loads connected before the external meter connection point. A meter is required. For the meter wiring mode, please refer to Fig 6.6 in Chapter 6. The external meter will detect power flowing to the grid and regulate the generated power so that only so much energy is generated as is currently consumed by the primary loads, secondary loads and charging the battery.

NOTE: The arrow at the bottom of the Meter or external CTs should point to The WIT.



Zero export to GRID:

In this mode, there is no output at the inverter's GRID port. The solar and battery power can only be supplied to Primary Loads via the LOAD port. The meter or external CTs is not required.



Smart Load:

Smart loads are connected to the GEN port and the Smart Load mode is set: during on-grid operation, it will supply grid power to smart loads; during off-grid operations, the power supply to smart loads is cut off when the battery SOC is below 50%. The wiring method is shown in Chapter 6 Fig 6.3.

AC couple:

The grid-tied inverter is connected to the GEN port and the AC Couple mode is set: during on-grid operation, the grid-tied inverter will be connected to the grid and generate electricity via the GEN port; during off-grid operation, the grid-tied inverter remains connected to the WIT inverter and generating power. The wiring method is shown in Chapter 6 Fig 6.2.

NOTE: Limitations for inverter connected to GEN port

1. Power restriction: The rated power of the inverter shall not exceed the smaller value between the PCS rated power and battery power.
2. Manufacturer requirement: External PV inverter must be manufactured by Growatt .
3. Safety compliance: Safety certification number must be identical to that of the PCS.
4. Communication protocol: In AC Couple mode, the PCS must be connected to lithium batteries equipped with communication functions.

7.2.2.2 System Operating Strategies of WIT 4-15K-HU

TOU (Time of use):

Configure the system to work in the preset mode during different time segments based on the peak-valley periods and electricity price. Setting items include: the operating mode, enable/disable AC Charging function (charge from grid). During the time not specifically configured, it will operate according to the system settings.

Setting

Advanced Setting ▲

☐ Maximum spontaneous self use Disable

Equipment mode selection and time setting ▲

☒ Time Slot 1 Load First 10 % Enable 17 : 43 ~ 17 : 46

☐ Time Slot 2 Load First 80 % Disable 17 : 20 ~ 17 : 21

☐ Time Slot 3 Load First -55 % Disable 17 : 28 ~ 17 : 31

☐ Time Slot 4 Load First 0 % Enable 17 : 32 ~ 17 : 33

Please Enter Password Yes Advanced Setting Cancel

Self-consumption:

The WIT inverter prioritizes supplying the solar power and battery energy to the loads. If Export Limitation is disabled, the surplus solar power can be fed to the grid, but the battery energy will not be exported to the grid; if Export Limitation is enabled, neither solar power nor battery energy would be sent to the grid. In case that the solar power is insufficient, the battery will discharge to power the loads. Priority of power supplied to the loads:

1. Solar panels;
2. Batteries;
3. Grids.

NOTE: In Load First mode, a meter is required.

Setting

☐ Reactivate Time after Export Limitation Failure 120 [1,5000]s

☐ Single phase anti backflow enable On

Parallel parameter setting ▲

☐ Parallel enable Disable

Advanced Setting ▲

☒ Maximum spontaneous self use On

Equipment mode selection and time setting ▼

Demand Management/Peak Shaving ▲

☐ Demand Management Setting Disable

☐ Peak Shaving Enable Disable

Please Enter Password Yes Advanced Setting Cancel

Grid Peak Shaving:

Set the forward power flow threshold A: once the load power on the external meter is greater than this value, the inverter will reduce charging power and boost power out until it reaches the maximum operating power of the WIT inverter. Set the reverse power flow threshold B: once the grid feed-in power on the external meter is greater than this value, the inverter will reduce output power and boost charging power until it reaches the maximum operating power of the WIT inverter.

Setting

100 % Disable

Demand Management/Peak Shaving

☒ Demand Management Setting Disable

☐ Peak Shaving Backup SOC Enable Disable

Microgrid system

Safety function control

☐ Register Value

☐ Please Select

☐ Start Address End Address

Read

Advanced Read

Event Record

Please Enter Password Yes Advanced Setting Cancel

NOTE: The priority of system operation modes should be: Demand management > TOU (Time of use) > Parameter settings.

Micro-grid (PV-ESS-DG Power System):

A generator is connected to the GEN port:

If the grid power is normal, the WIT inverter will work in the grid-tied mode:

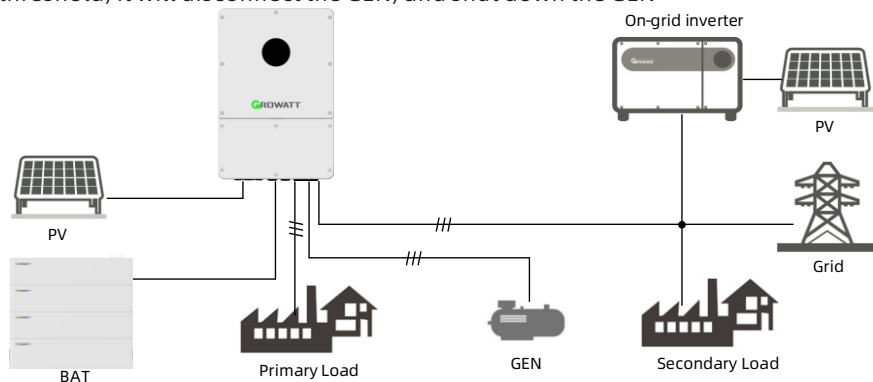
1. If the power generated by the grid-tied inverter is sufficient to support the loads, the surplus power will be used to charge the battery;
2. If the power generated by the grid-tied inverter is insufficient, the WIT inverter will supply the solar power to the loads, and direct the surplus power to charge the battery;
3. If the solar power of the WIT inverter is insufficient, the battery will discharge to power the loads;

4. The battery will stop discharging when the SOC is lower than the cutoff threshold and it will draw the grid power to support the loads;

If the grid power is abnormal, the WIT inverter will work in the off-grid mode:

1. The solar power of the WIT inverter is supplied to the loads first, and the surplus power is sent to charge the battery.

2. If the solar power of the WIT inverter is insufficient, the battery will discharge to power the loads.
3. When the battery SOC is lower than the preset diesel generator startup threshold, the GEN will start automatically to generate power
4. If charging from the GEN is enabled, the GEN will charge the battery.
5. When the battery SOC is higher than the preset diesel generator shutdown threshold, it will disconnect the GEN, and shut down the GEN



User-defined dry contact:

After enabling the user-defined DI port and inputting the DI signal, it will carry out the AC active power and power factor according to the corresponding DI instructions.

- NOTE:** 1. The User-defined dry contact and DRMS share the same port.
2. Only one DI signal can be input at the same time.

7.2.3 Fault Mode

The intelligent control system of the WIT Inverter monitors and adjusts the system status in real time. When the WIT Inverter detects an alarm, the corresponding status light will turn red and the OLED will display the alarm. When the WIT Inverter detects a fault, the system status indicator and the corresponding status light will turn red and the OLED will display the fault. After the fault or alarm is cleared, the system recovers and all status indicators will be steady green.

NOTE: For details about faults and alarms, please see 9.2 Troubleshooting.

7.2.4 Shutdown Mode

When the battery SOC is lower than the discharge cutoff SOC and the PV string output power does not meet the requirements for grid-tied power generation, the WIT Inverter will automatically shut down. In shutdown mode, the inverter still consumes a bit energy ($PV > Grid > Battery$) to wait to start up again when the operating requirements are met.

NOTE: When the PV input voltage is less than 150V or the battery input voltage is less than 40V, the WIT inverter will automatically shut down.

7.3 LED and OLED Displays Panel

The LED and OLED display panel demonstrating the running status of the WIT Inverter is shown in the Fig 7.6. The symbol description is shown in Table 7.1; The user interfaces are shown in Fig 7.7, and the LED indicator description is shown in Table 7.2.

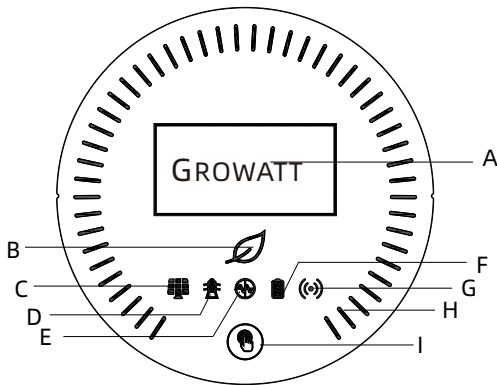


Fig 7.1 Display panel

Table 7.1 Symbol Description

Position	Description	Note
A	OLED screen	Displays the main system information
B	System indicator	Displays the system status
C	PV indicator	Indicates the operation status on the PV side
D	Grid/GEN indicator	indicates the operation status on the grid side and the GEN port status
E	Off-grid indicator	Indicates whether the off-grid mode is enabled
F	Battery indicator	Indicates the status of the battery
G	Communication	Indicates the communication status and other system faults
H	Battery status indicator	Indicates the charging and discharging mode of the battery
I	Button	You can switch the information displayed on the OLED by pressing the button

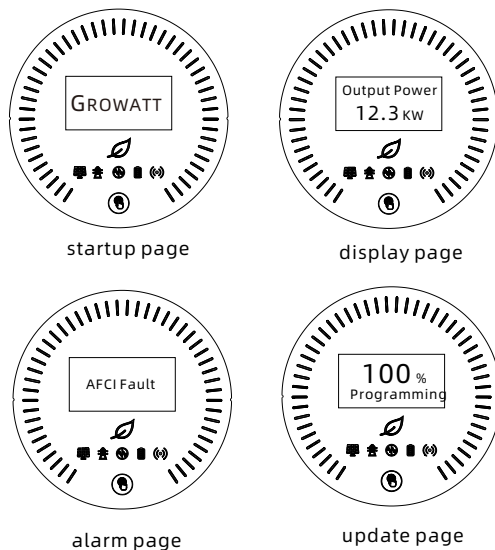
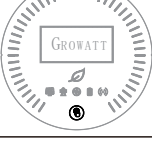


Fig 7.2 User interfaces

Table 7.2 Indicator description

	Status	Meaning
	Off	The system is not operating
	Steady green	The system is operating properly
	Blinking green at long intervals	The system is in standby mode or performing an upgrade
	Steady red	System failure
	Off	The PV voltage dose not reach the operating voltage
	Steady green	The PV voltage reaches the operating voltage
	Steady red	A fault or alarm is reported on the PV side
	Off	The grid voltage does not reach the operating voltage or the GEN is nomal
	Steady green	Successfully connected to the grid
	Blinking red at long intervals	A fault or alarm is reported on the GEN side
	Steady red	A fault or alarm is reported on the grid side

	Status	Meaning
	Off	Off-grid mode is disabled
	Steady green	Off-grid mode is enabled and has no faults or alarms
	Steady red	Off-grid mode is enabled and a fault or alarm is reported on the AC side
	Off	Battery voltage is below the operating voltage
	Steady green	The SOC's connected to the battery are all sufficient and there are no faults or alarms
	Blinking green at long intervals	Low battery SOC
	Steady red	A fault or alarm is reported on the battery side
	Steady green	External communication is normal, such as RS485, WiLAN, etc.
	Blinking green at long intervals	The WIT Inverter is upgrading or the USB interface is reading and writing data
	Steady red	External communication fails, or a system fault occurs, or the GEN port fails
	Steady white	Battery is in standby mode
	Rotates clockwise	Charging mode
	Rotates anticlockwise	Discharging mode
	Displays critical system information. Users can call up and switch the interface by tapping the button. When a fault or alarm occurs in the system, the fault or alarm will be displayed.	
	The OLED will be activated when the button is pressed. The OLED will turn off if there is no operation for 5 minutes.	