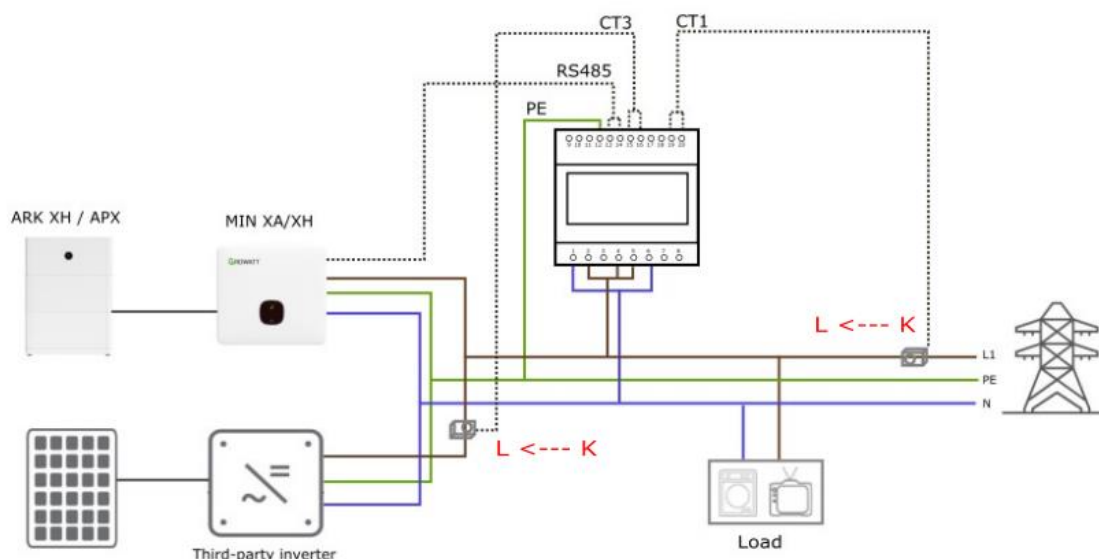


Growatt Smart Meter For Flexible System Retrofit - Single Phase

Growatt offers flexible retrofit solutions to upgrade existing PV systems and expand energy storage. The TPM-CT-E (SDM630 MCT) smart meter enables Growatt's single-phase battery inverters MIN-XH and ARK-HV / APX batteries for AC-coupled retrofits. Accurately measure power with multi-function monitoring. Easy installation with current transformers and RS485 communication. Switch between on-grid and off-grid modes by adding a SYN Box (SYN 50-XH-10) for backup power supply. Ideal for residential and commercial systems seeking more storage capacity, energy independence, and futureproofing.



For the users who already have a PV system installed, Growatt offers solutions for retrofitting existing systems and expanding energy storage capacity. With Growatt Smart Meter TPM-CT-E, Growatt single-phase battery ready inverters MIN 2500-6000TL-XH with ARK-XH (with power module BDC) or APX battery (with power module APX P0) can be used in AC-Couple application scenarios, which provide great flexibility for upgrading existing PV systems.

Attention! When retrofitting a single-phase system, please use an Growatt three-phase smart meter TPM-CT-E and set the COM address to 2. **The export limitation function is not supported in the case of a retrofit.**

The reason is that there is no way to control third-party inverters. MIN 2500-6000TL-XH is shipped in Default Mode, and when applied to a retrofit scene, it needs to be set to System Retrofit Mode on OLED, ShineTools or OSS and the grid type selected. If there is not the option to change the system working mode to 'retrofit system', a firmware update is needed.

Specifications of TPM-CT-E

CT3 will detect the third-party inverters' production, CT1 will detect the grid connection point import and export power.

Direction of the arrows on the CT

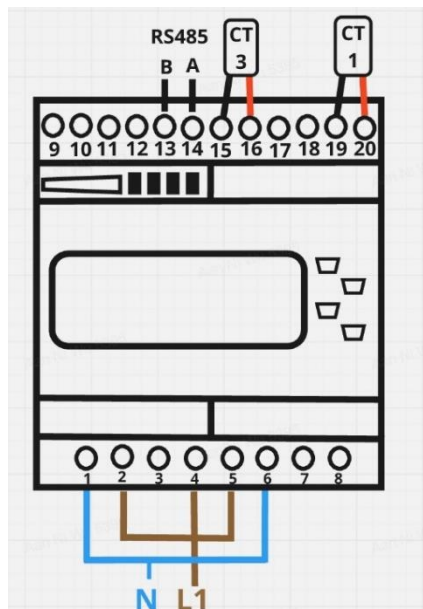
- Ensure that the arrows on CT1 point from the grid toward the load.
- Ensure that the arrows on CT3 point from the grid toward the third-party PV inverter.

L = load

K = grid

In a retrofit system, the key steps are establishing communication between TPM-CT-E and the inverter, installing the meter and CTs.

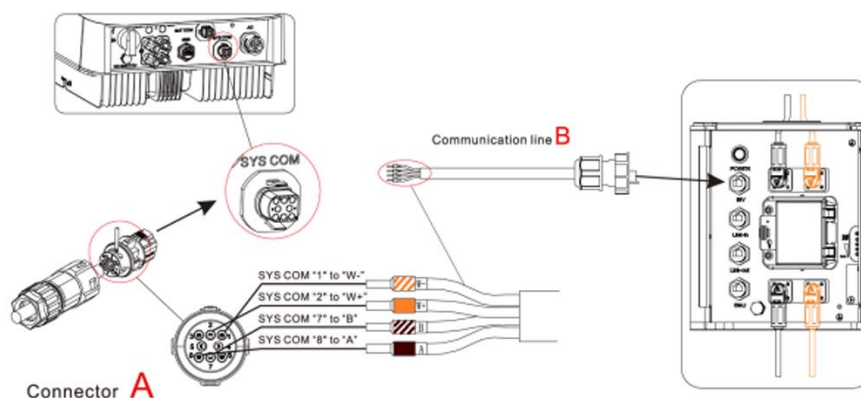
Pin	Meter
1	N = N
2	L1 = L1
4	L3 = L1
5	LA = L1
6	NA = N
12	GROUND
13	RS485-B (SYS COM PIN 6)
14	RS485-A (SYS COM PIN 5)
15	S2 (CT3) Black wire
16	S1 (CT3) White wire
19	S2 (CT1) Black wire
20	S1 (CT1) White wire



Installing SYS COM connector of the inverter

The MIN2.5K-6KTL-XH inverters are equipped with an 8-pin SYS COM connector as standard. This connector integrates the RS485 connections, which are then connected to the inverter. Below, you will find an image of this connector along with the corresponding pin definitions

NO.	Omschrijving	NO.	Omschrijving
1	Battery W-	5	Smart meter RS485-A
2	Battery W+	6	Smart meter RS485-B
3	RS485A2:Connect Min ShineBus or third party monitoring equipment	7	Battery RS485-B
4	RS485B2:Connect Min ShineBus or third party monitoring equipment	8	Battery RS485-A



Communication interfaces

SYS COM Port

The -XH series inverter provides a 8 pin SYS COM Port connector. The SYS COM Port connector signal distribution and function are shown in the following table:



SYS COM Port Pin Definitions

NO	Definition	NO	Definition
1	Enable-: Connect BDC enable signal port negative	5	RS485A1:Signal for meter
2	Enable+: Connect BDC enable signal port positive	6	RS485B1:Signal for meter
3	RS485A2:Connect Min ShineBus or third party monitoring equipment	7	BAT-B: Connect BDC communication RS485B or CANL
4	RS485B2:Connect Min ShineBus or third party monitoring equipment	8	BAT-A: Connect BDC communication RS485A or CANH

System Settings

After the system is correctly installed, it is necessary to check if the Growatt smart meter is online and set the Growatt inverter to System Retrofit mode.

Checking if Growatt smart meter is online

Set on OLED: go to advanced settings via the screen on the inverter. Set parameters -> Advanced -> Password: 123 -> Power Sensor Meter -> set to On.



Pressing the button 1 time is selecting
Pressing the button 2 times is to confirm
Pressing the button 3 times is to go back

Set in OSS: go to OSS and click on 'Set up' button of the inverter. Advanced read the following registers: 180 and 533. Both registers need to be set to 1 (enable). If register 180 will not change to value 1, please check the polarity of the RS485 cable and measure the wires with a multi meter if the voltage is between 3-5 volt. If the voltage is lower than 3 volt, replace the cable.

☒ Register

Adjusting register 180

☐ Start Address

☐ Register

☒ **Current Value(180~180): 1**
Current value after reading

☐ Please Select

☐ Start Address

☒ Yes
 ☐ No
 Reading register 180

☒ Register

Adjusting register 533

☐ Start Address

☐ Register

☒ **Current Value(533~533): Electric Meter**
Current value of register 533, Electric Meter = 1

☐ Please Select

☐ Start Address

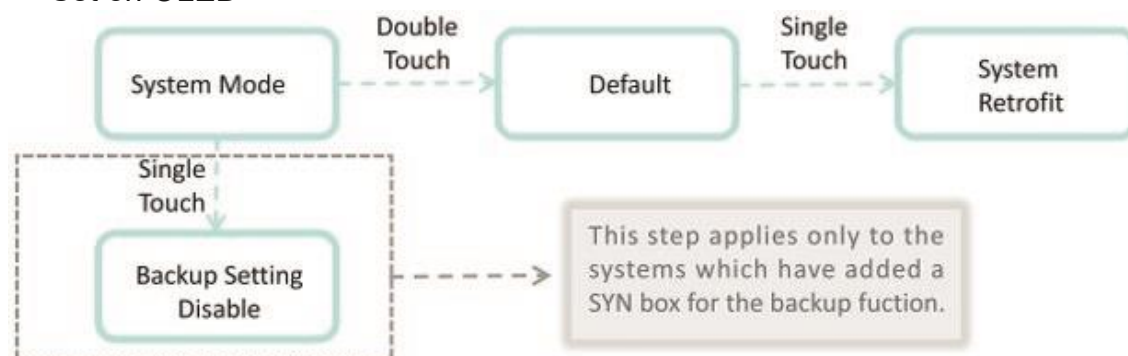
☒ Yes
 ☐ No
 Reading register 533

Setting system mode to Retrofit system

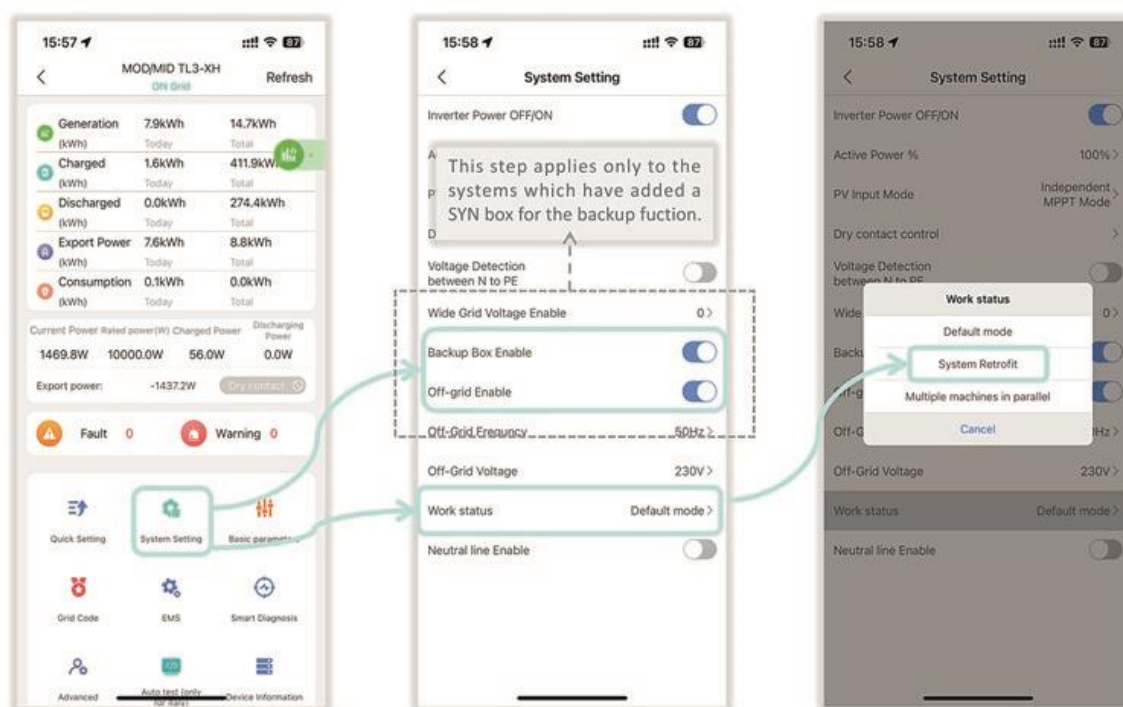
This can be done via the inverter's display, the ShineTools app, or the OSS platform. If the system has a SYN box (SYN 50-XH-10) installed and needs to be switched from on-grid to off-grid, the Backup Mode also needs to be enabled.

If the option to change the system mode to 'retrofit system' is not available, a firmware update is required. Please contact Growatt After Sales Support to request a remote firmware update.

- Set on OLED



- Set on ShineTools APP



- Set on OSS

The screenshot shows the 'Set Inverter' configuration window. On the left, there is a list of settings: Pre PTO, CV Voltage, CC Current, Working Mode, LCD Language, Restore Factory Setting, Country/Area, and Custom PF Curve. The 'Working Mode' option is selected and highlighted with a green box. A green arrow points from this box to the 'Working Mode' dropdown menu on the right, which is also highlighted with a green box. The dropdown menu is open, showing options: Default, System Retrofit, Multi-Parallel, and Germany. Below the dropdown, there are four rows of 'Point' settings (Point 1 to Point 4), each with 'Power percent' and 'PF Line Point' fields. At the bottom, there are 'Yes' and 'No' buttons.

Set Inverter

Pre PTO ☐ Disable

CV Voltage ☐ 58 (38~58V)

CC Current ☐ 60 (0~60A)

Working Mode ☒ Default

LCD Language ☐ Default

Restore Factory Setting ☐ System Retrofit

Country/Area ☐ Multi-Parallel

Germany

Point 1 (Power percent, PF Line Point) 255 1.0

Point 2 (Power percent, PF Line Point) 255 1.0

Point 3 (Power percent, PF Line Point) 255 1.0

Point 4 (Power percent, PF Line Point) 255 1.0

Power percent (0~100,255); PF Line Point (-1~-0.8,0.8~1);

Yes No

The screenshot shows the 'Set Inverter' configuration window, specifically the 'Off-grid function setting' section. A text box at the top right states: 'This step applies only to the systems which have added a SYN box for the backup function.' The 'Off-grid function setting' dropdown is expanded, showing options: Set Backup On/Off, Set Backup Frequency, Set Backup Voltage, Generator Charge Enable, Generator Control, and Generator Rating. The 'Set Backup On/Off' option is selected and highlighted with a green box. A green arrow points from this box to the 'Enable' dropdown menu, which is also highlighted with a green box. The 'Enable' dropdown is open, showing the 'Enable' option. Below the dropdown, there are four rows of settings: Set Backup Frequency (50Hz), Set Backup Voltage (230), Generator Charge Enable (Disable), and Generator Control (Not force). At the bottom, there are 'Yes' and 'No' buttons.

Set Inverter

Dry Function

Off-grid function setting

Set Backup On/Off ☒ Enable

Set Backup Frequency ☐ 50Hz

Set Backup Voltage ☐ 230

Generator Charge Enable ☐ Disable

Generator Control ☐ Not force

Generator Rating ☐ 0 W [0-60000]

Regulation parameter setting

Q(V)setting

Yes No

This step applies only to the systems which have added a SYN box for the backup function.