Growatt Smart Meter For Flexible System Retrofit

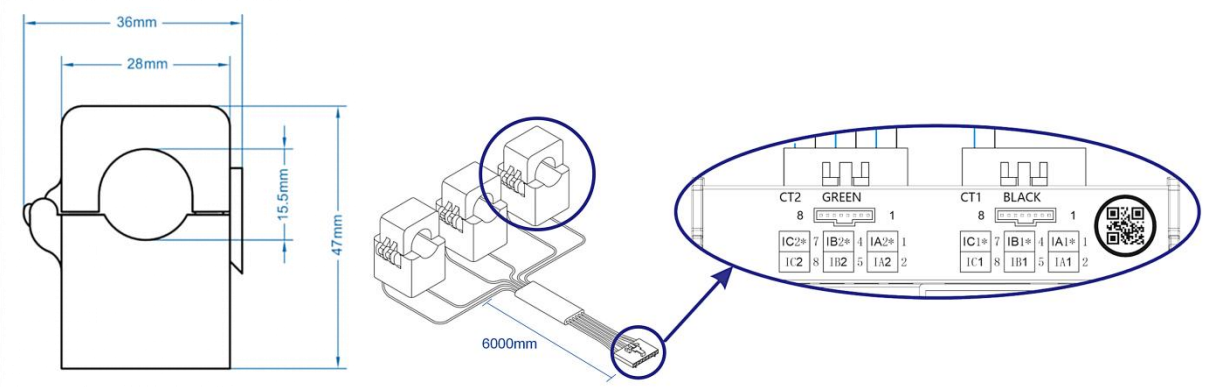
For the users who already have a PV system installed, Growatt offers solutions for retrofitting existing systems and expanding energy storage capacity. With Growatt Smart Meter TPM-CT-C(6CT), Growatt three-phase battery ready inverters MOD-XH(BP), MID-XH with APX HV battery can be used in AC-Couple application scenarios, which provide great flexibility for upgrading existing PV systems.

Previously, Growatt released a dual-CT retrofit solution for single-phase system. Now for retrofitting three-phase systems, the retrofit solution with TPM-CT-C(6CT) meter came into being. This article introduces the specifications, installation, and system setup of the retrofit solution with TPM-CT-C(6CT) meter.

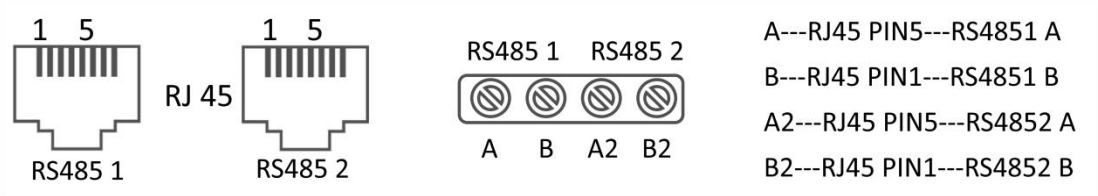
1. Specifications of TPM-CT-C(6CT)

TPM-CT-C(6CT) is a multi-function rail meter, it can accurately measure and display various power parameters in 3P3W/3P4W: voltage, current, power, frequency, active power, reactive power, forward power, reverse power, total harmonics, etc. The meter is suitable for real-time power monitoring system, with multi-function, multi-purpose, high stability and long life characteristics.

The meter is connected with 6 external current transformers which nominal current is 100A(40mA secondary). 3 CTs for monitoring power generation from the third-party inverter and 3 CTs for monitoring total system power generation.



TPM-CT-C(6CT) has two RS485 communication channels, with the default communication rate of 9600bps. The communication ports are defined below, choose either RJ45 type or screw type to use.



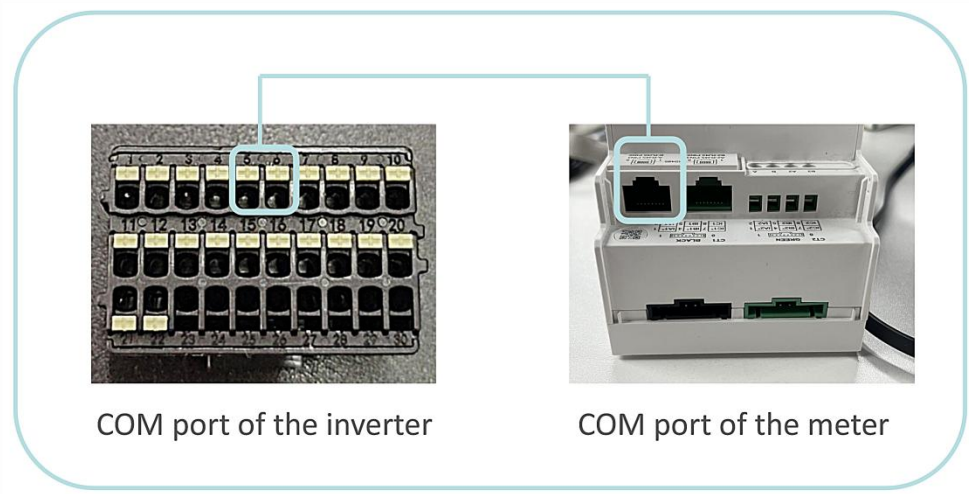
2. Retrofitting systems with TPM-CT-C(6CT)

In the process of retrofitting an existing three-phase PV system, the key steps are establishing communication between TPM-CT-C(6CT) and the inverter, installing the meter and CTs.

- **Establish Communication**

  Take PIN5 (RS4851 A) and PIN1 (RS4851 B) of the RJ45 network cable and connect them to PIN5 (RS485A) and PIN6 (RS485B) of the inverter's COM port. MOD-XH(BP) and MID-XH have the same definition of PIN for communication with the meter.

  Please note that the RS485-1 channel of the meter should be used to communicate with Growatt inverter so that the communication address matches exactly with the inverter without any additional settings.

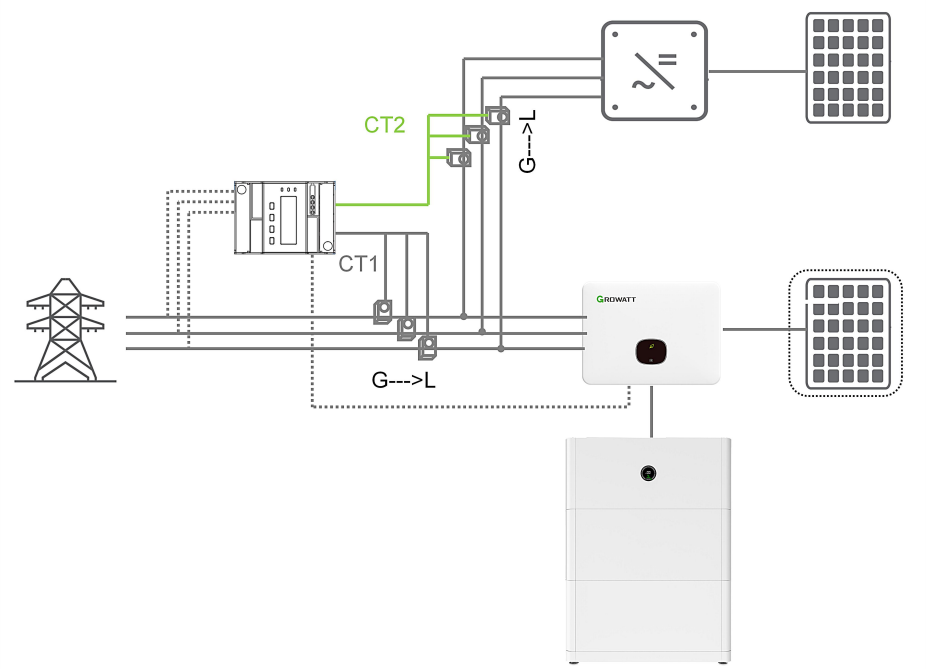


- **Installing TPM-CT-C(6CT) and CTs**

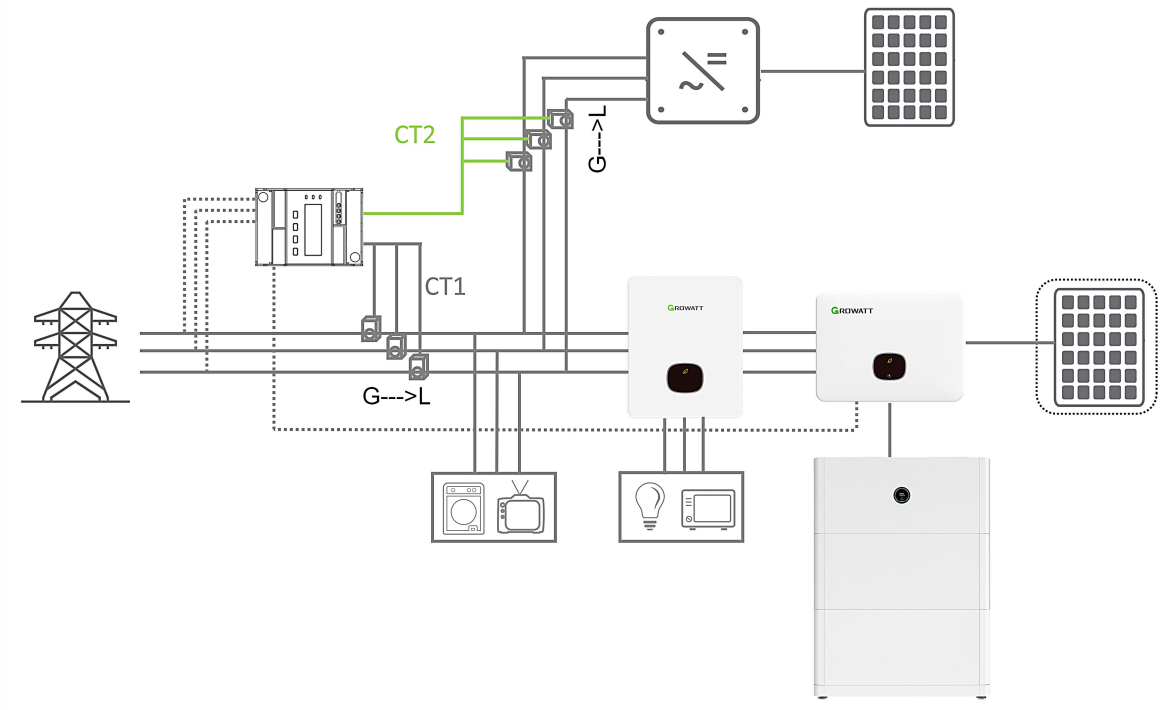
  Install TPM-CT-C(6CT) on the grid side. The installation of the CTs needs to strictly follow:

a. The three CTs on CT1 port are snapped on the grid side to detect the total power generation of the system.
b. The three CTs on CT2 port are snapped at the output of the third-party inverter to detect the power generation of the original system.
c. The direction of the arrow on the CT is pointing from the grid to the load.

The installation diagram is shown below:



In addition, by installing a SYN Box(SYN 50-XH-30 for MOD-XH(BP), SYN 100-XH-30 for MID-XH), the system is able to switch from on-grid to off-grid, and by connecting critical loads to the SYN box to ensure continuous power supply to the critical loads in case of power outage.

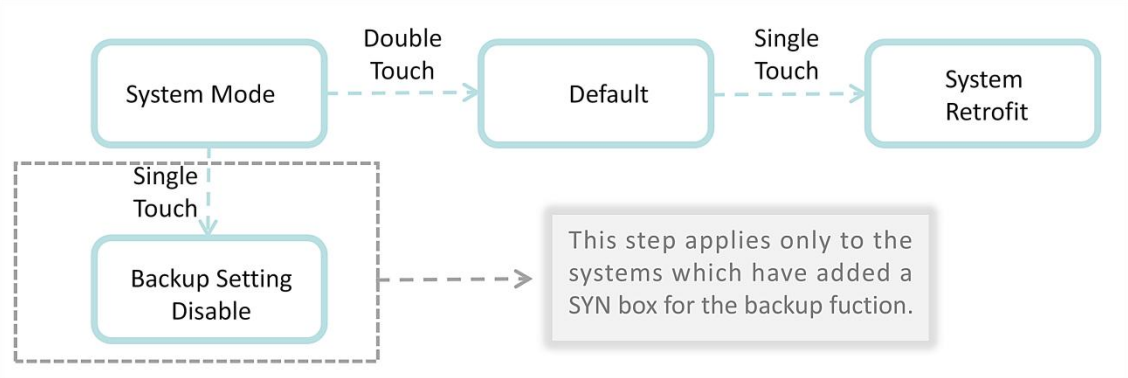


In the above scheme, Growatt inverter can be used to retrofit any brand of third-party system, however, the whole system doesn't have the export limitation function due to the inability to control the third-party inverter.

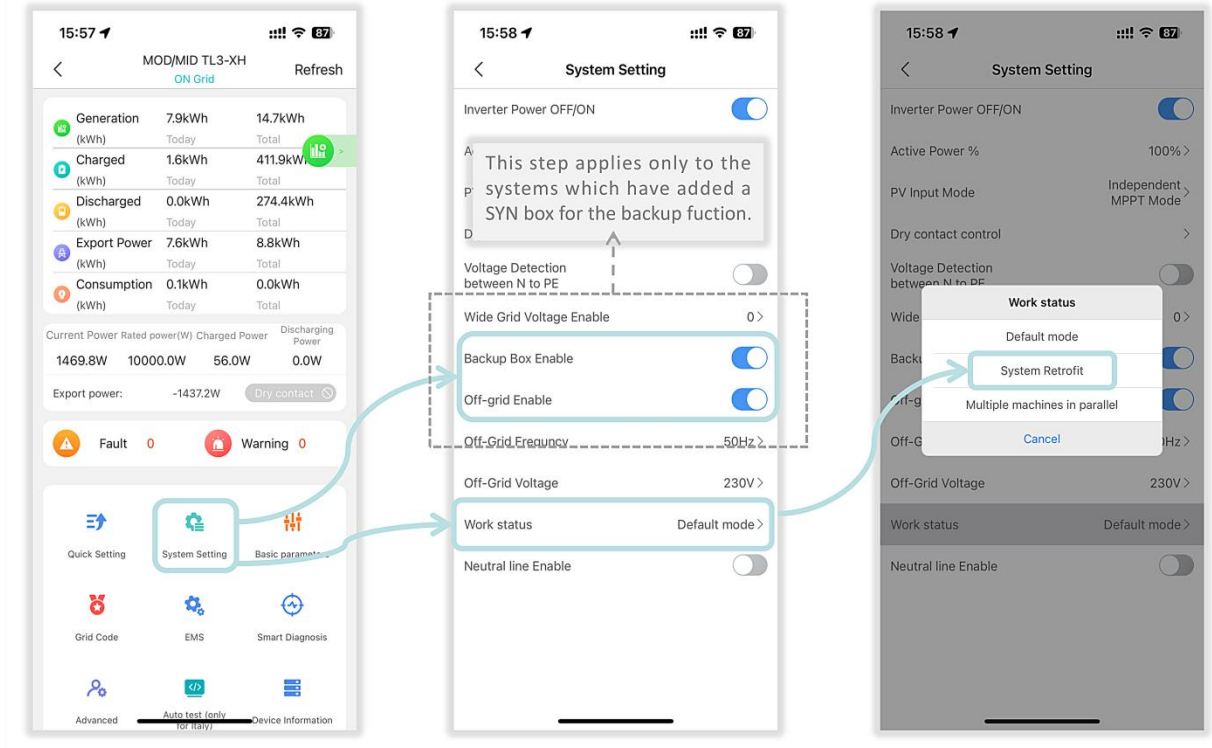
3. System settings

After the system is properly installed, the Growatt inverter needs to be set to System Retrofit mode via the inverter's OLED, ShineTools, or OSS platform. If the system has a SYN box installed and needs to be switched from on-grid to off-grid, the Backup Mode also needs to be enabled, otherwise not.

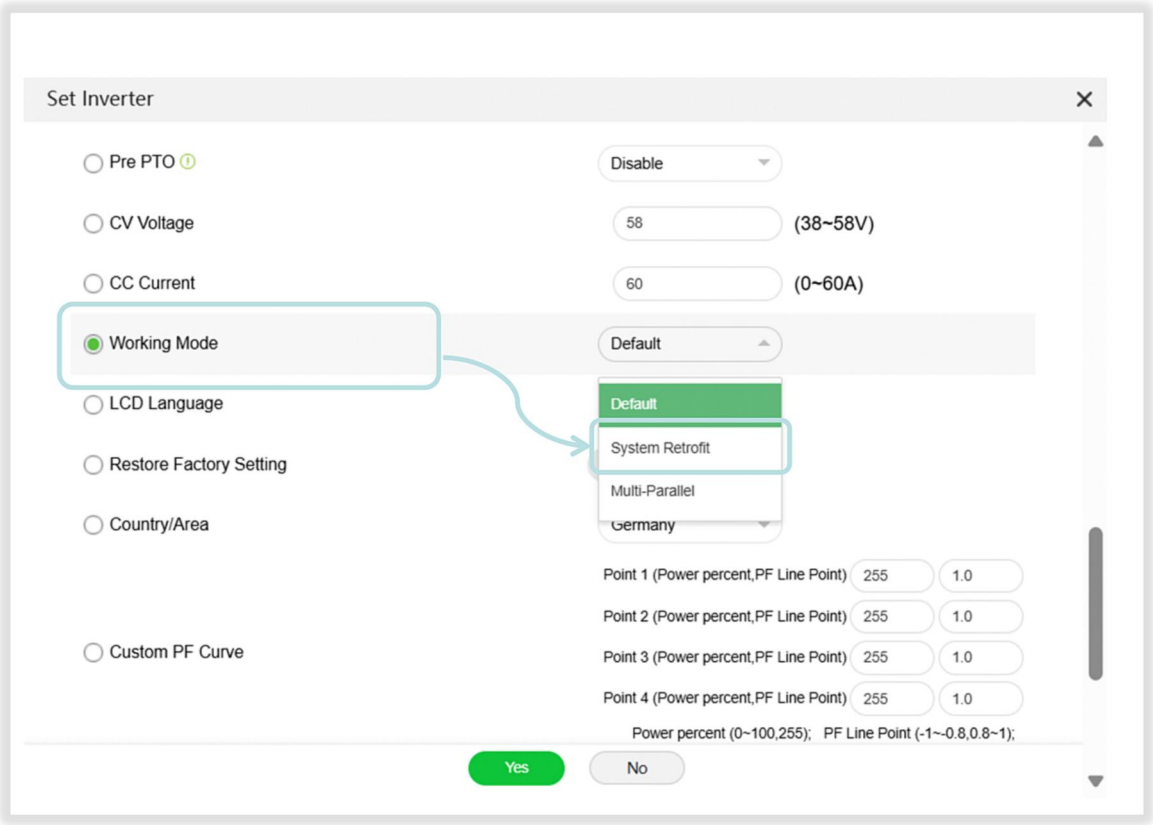
- **Set on OLED**

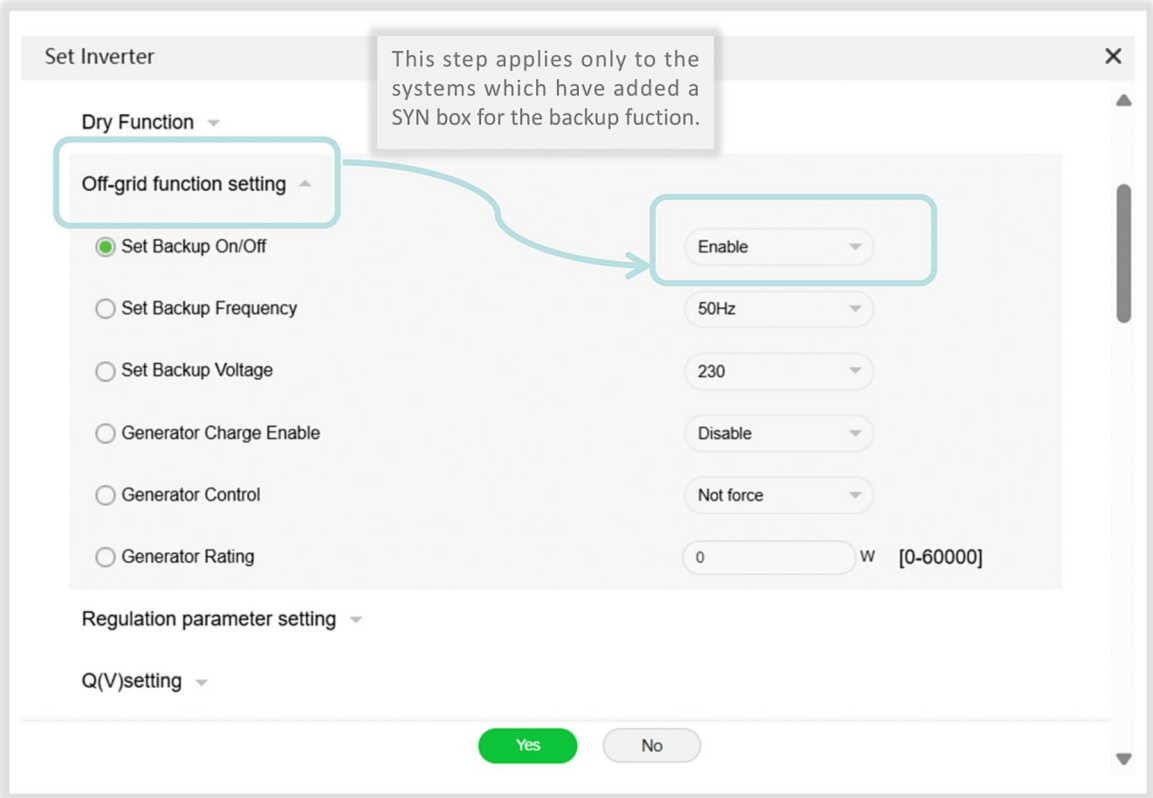


- **Set on ShineTools APP**



- **Set on OSS**


Set Inverter
Pre PTO
Disable
CV Voltage
58
(38~58V)
CC Current
60
(0~60A)
Working Mode
Default
LCD Language
Default
System Retrofit
Multi-Parallel
Restore Factory Setting
Country/Area
Germany
Point 1 (Power percent,PF Line Point) 255 1.0
Point 2 (Power percent,PF Line Point) 255 1.0
Custom PF Curve
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


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