

GoodWe Smart Meter Solution with 2 CTs

V01, UPDATED ON JANUARY 18TH, 2020

Along with different application scenarios and local requirements for household power systems are different solutions such as hybrid energy storage system, retrofit energy storage system and that for SPLIT system. This article focuses on a new solution from GoodWe to AC-coupled energy storage system and application in SPLIT phase system.

GoodWe Solution

In addition to single-phase and three-phase smart meters for normal system, GoodWe has developed two different smart meters which come with 2 CTs individually for special application.

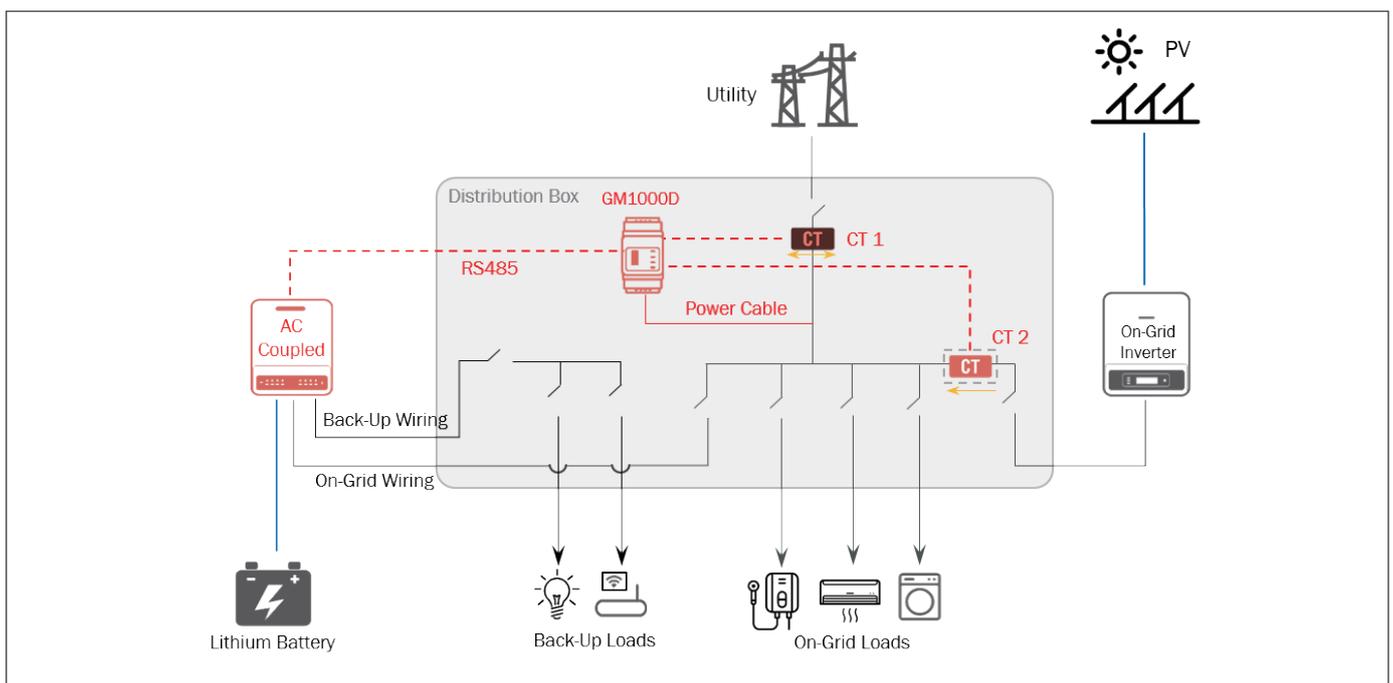
- ▶ GM1000D for single-phase AC-coupled energy storage system
- ▶ GM2000 for SPLIT phase power system

Note
Smart meter is a standard component of GoodWe storage inverter and it is not necessary to purchase smart meter separately.

● GM1000D Solution

GM1000D is a smart meter with 2 CTs attached on it, used for single-phase AC-coupled energy storage system with GoodWe AC-coupled inverters such as SBP and BH series.

As C-coupled inverter does not connect to PV strings directly and it has to work with grid-tied solar system, therefore, PV production data in a retrofit system cannot be acquired by AC-coupled inverter itself without external device. That is to say it is not possible to monitor and manage energy in this retrofit system with both AC-coupled and grid-tied inverter as a whole. However, with GoodWe smart meter GM1000D we can get out of this kind of dilemma. The wiring diagram of this system is as below.



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In this retrofit system with AC-coupled inverter

CT 1 is a bidirectional CT clamp that detects the real-time up-flow or down-flow current through it, which is important for the system to decide whether to charge or discharge battery.

CT 2 is a one-way CT clamp, which detects only the output current (Ia) from grid-tied system. **Power Cable** both powers up GM1000D and detects AC voltage (Va) of the electricity system.

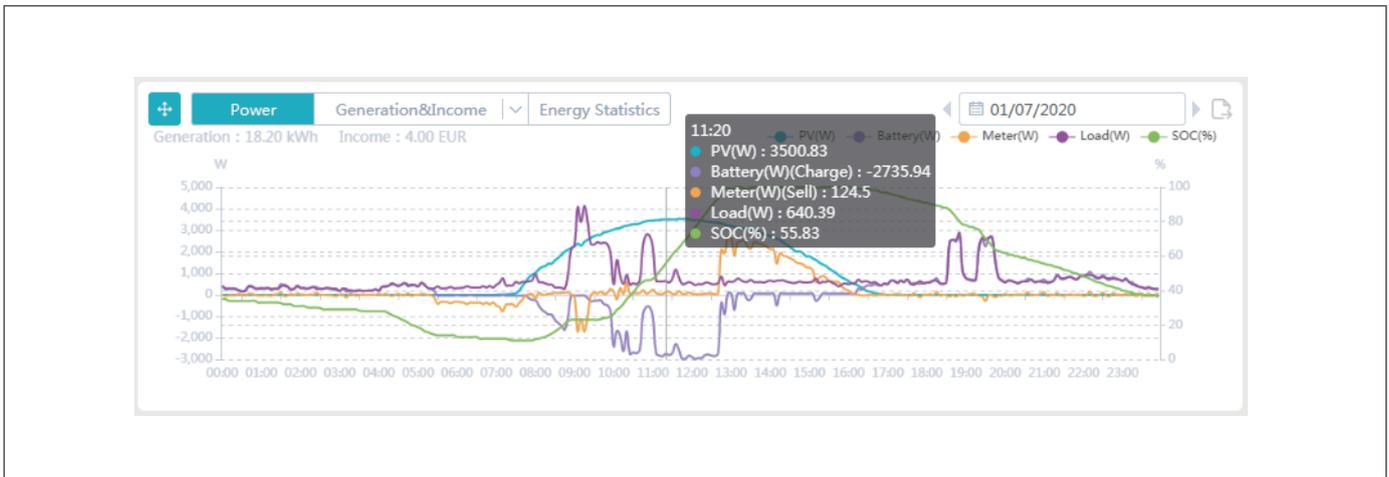
By this way, GM1000D is able to calculate grid-tied solar system production: $P_a = I_a * V_a$ and further to calculate real-time consumption of loads:

$$P_{load} = P_a - P_{charge} - P_{Grid} \text{ (exporting)}$$

Or

$$P_{load} = P_a + P_{discharge} + P_{grid} \text{ (importing)}$$

With CT 2, monitoring data are complete as shown in below.



● **GM2000 Solution**

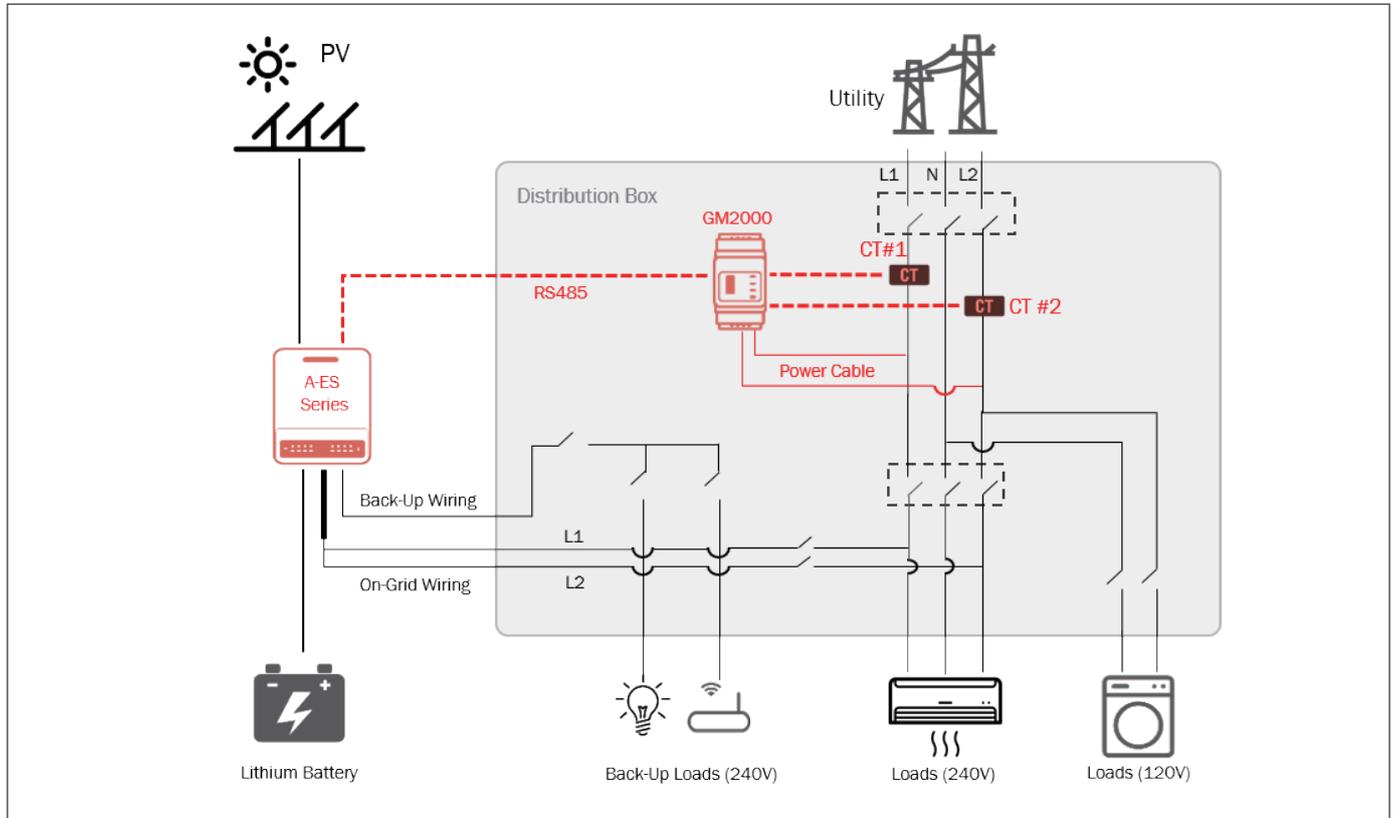
GM2000 is a smart meter with 2 CTs, which is applied in hybrid energy storage system with single-phase inverter A-ES. A-ES is a hybrid product for SPLIT phase system mainly in North America.

In SPLIT phase system, there are two line wires and one neutral wire (L1/N/L2). The phase voltage is 120V (in North America) and but there could be loads that consume 120V and 240V in the same system. Thus, it is more complicated to collect data in a SPLIT system.

For such household power system in Northern America, GoodWe offers smart meter GM2000 (with 2 CTs) of special control logic. The wiring diagram of this system is as below.

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CT#1 and CT#2 are both bidirectional CT clamps that detect the real-time up-flow and down-flow current through them on phase A and phase B, which is important for the system to decide whether to charge or discharge battery.

Power Cable is used to both power up GM2000 and to detect AC voltage of the electricity system.

By this way, GW2000 is able to know the detailed system reaction with utility and to calculate the general load power in the system.

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