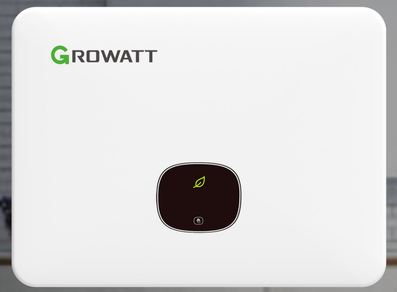
# Growatt -XL Series Inverter Solutions for Norway

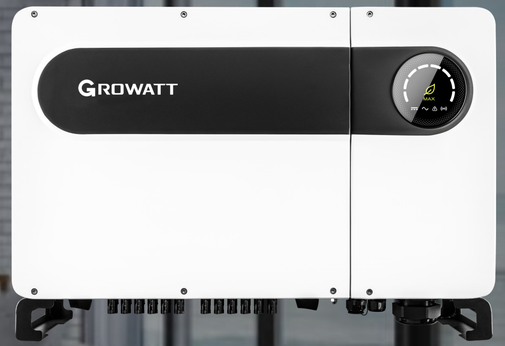
SHENZHEN GROWATT NEW ENERGY CO.,LTD

# Product Overview


MID 6-12KTL3-XL




MID 15-20KTL3-XL




MAX 25-50KTL3-XL

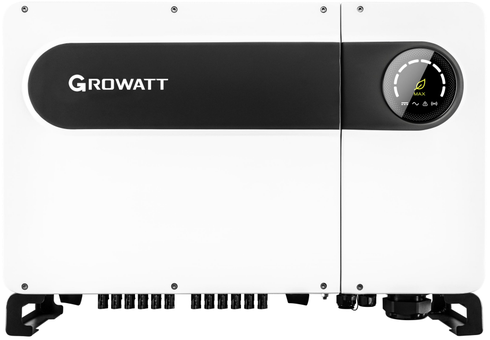
# 01

## High Yields

# Multiple MPPTs Design




**50% loss** for one MPPT of 10
**Lead to 5% loss**




MAX 25-50KTL3-XL

- 6 MPP trackers, flexible configuration, reduce the loss of module mismatch
- Max 20 strings, higher DC/AC ratio capability, optimized the LCOE of system

# High Yields

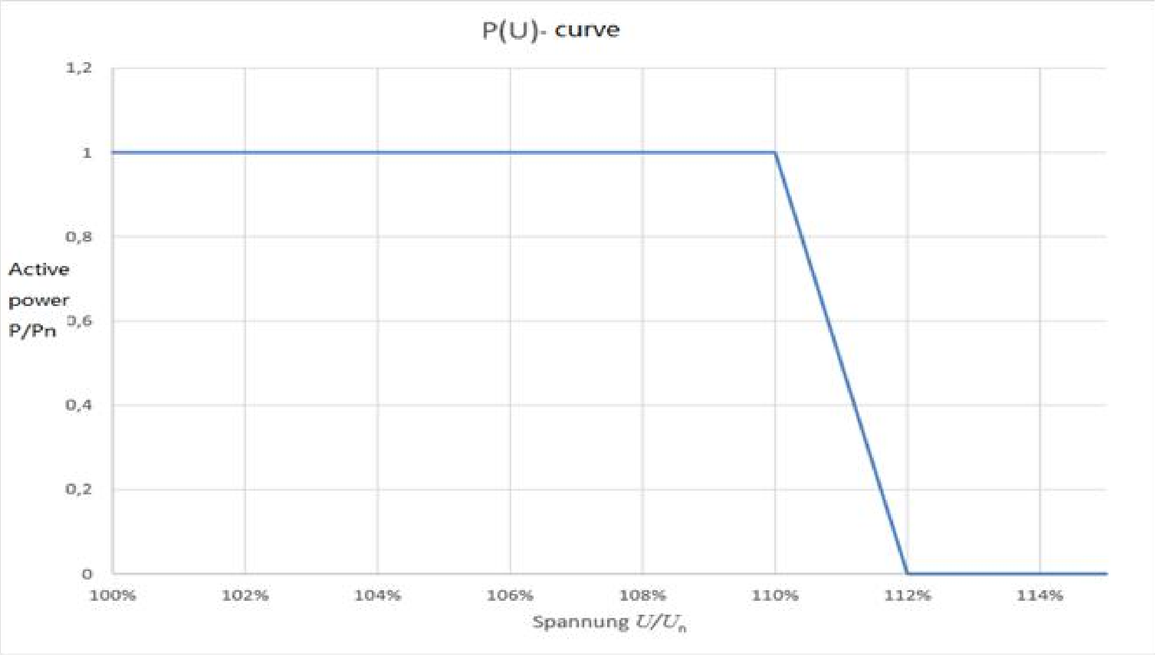
| Model | MID 6-12KTL3-XL | MID 15-20KTL3-XL | MAX 25-50KTL3-XL |
|---|---|---|---|
| MPPT/string number per MPPT | 2/2 | 4/2 | 6/2 |
| String Current | 13.5A | 13A | 13A |
| DC/AC Ratio | 1.3 | 1.5 | 1.5 |
| MPPT voltage range | 160-800V | 200V-850V | 200V-850V |

13A string current, perfect compatible with 166 and 182 panels, for example Jinko 440

Wide MPPT working range, longer working time during the day

Higher DC/AC Ratio

# P(U) Control




## Avoid disconnection for more production

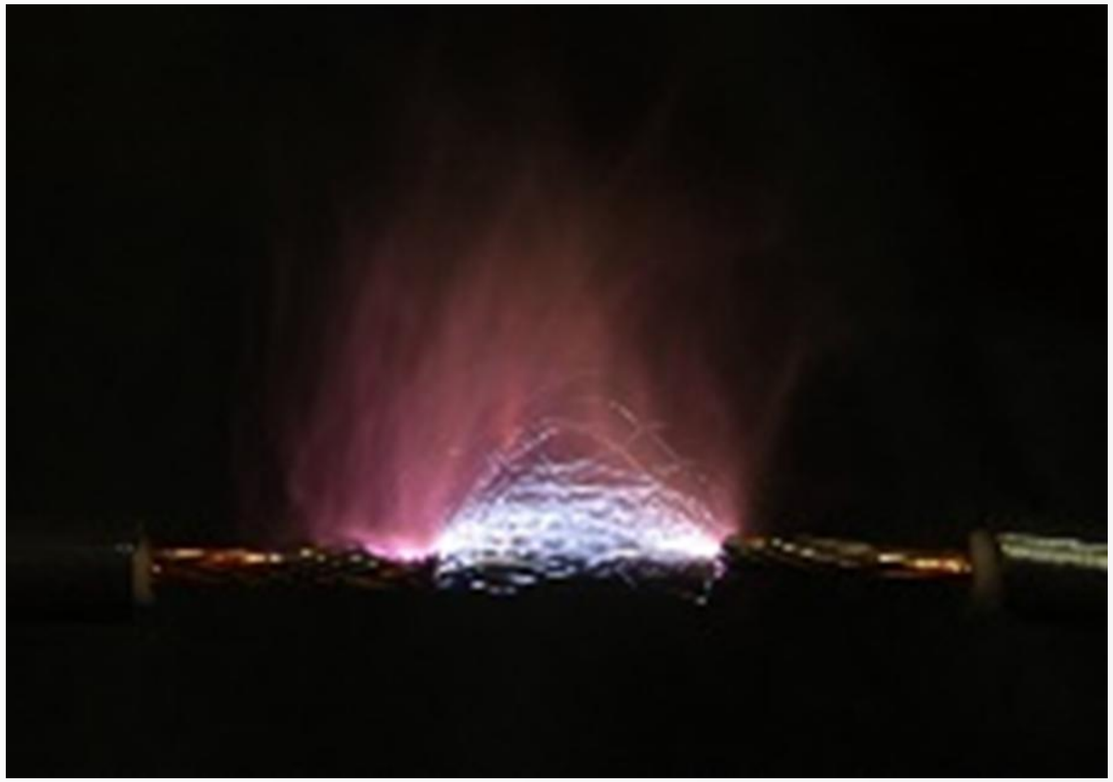
Avoid disconnection due to overvoltage production
Inverter keep generating more power

# 02

## Safe & Reliable

# Active Safety with AFCI

## Active arcing protection secure your solar investment



AFCI -- Arc Fault Circuit Interrupter

- Easy set and test via APP
- Speedy arc protection inverter shutdown in 2.5S
- UL1699B: 2018 Certified

# Comprehensive Protections

| Model | MID 6-12KTL3-XL | MID 15-20KTL3-XL | MAX 25-50KTL3-XL |
|---|---|---|---|
| Type II SPD DC side | √ | √ | √ |
| Type II SPD AC side | √ | √ | √ |
| AFCI | √ | √ | √ |
| IP degree | IP65 | IP66 | IP65 |

# 03

# Lower BOS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Smart Energy Manager

# High power modules compatible

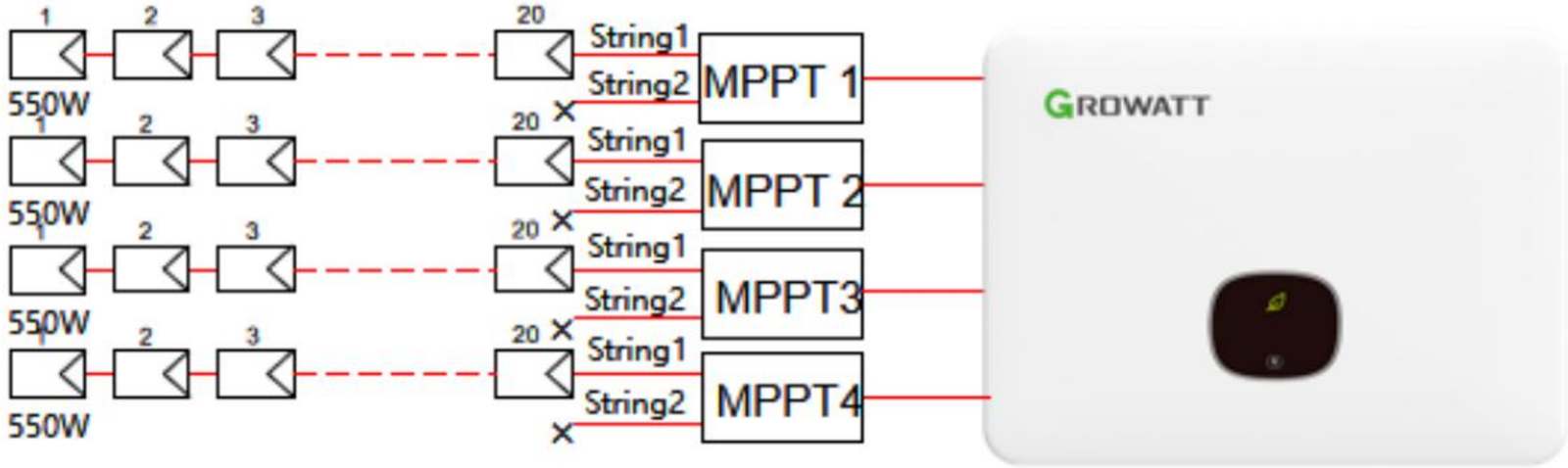
## High power PV modules lead to BOS cost savings

The new high-power solar panels 400W+ can reduce the system cost, but due to the high current puts new requirements for inverters.
X Generation Inverters supports high power modules.

The cost of photovoltaic modules accounts for more than 50%, reducing the number of strings and the number of modules high costs in BOS and transportation costs can be optimized

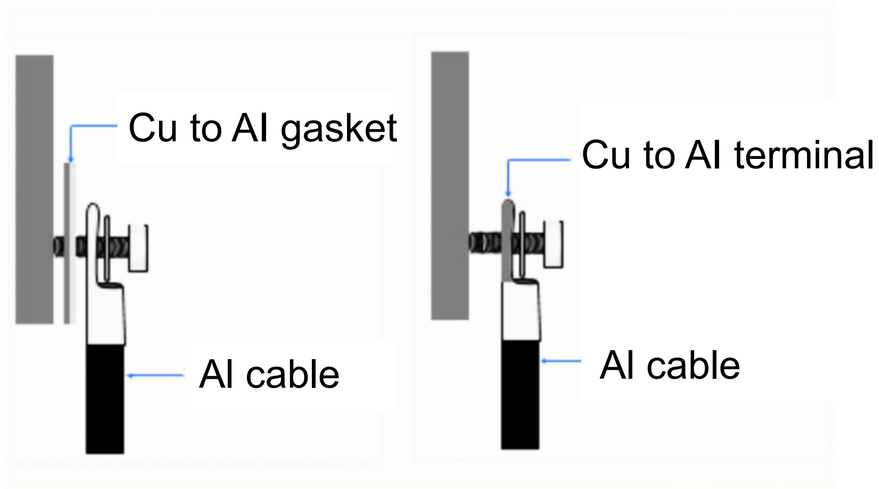
| Model | MID 6-12KTL3-XL | MID 15-20KTL3-XL | MAX 25-50KTL3-XL |
|---|---|---|---|
| String Current | 13.5A | 13A | 13A |

# High Power Modules Compatible




As for the larger power panel, it also could be apapt the special method
The cost of photovoltaic modules accounts for more than 50% , reducing the number of strings and the number of modules high costs in BOS and transportation costs can be optimized

# Compatible with Al and Cu AC Cables




| Inverter Model | Copper wire cross-sectional area(mm²) | Copper wire recommendation(mm²) | Aluminum wire recommendation(mm²) |
|---|---|---|---|
| MAX 25KTL3-XL | 25-35 | 35 | 50 |
| MAX 30KTL3-XL | 25-35 | 35 | 50 |
| MAX 35KTL3-XL | 35-50 | 50 | 70 |
| MAX 40KTL3-XL | 35-50 | 50 | 70 |
| MAX 50KTL3-XL | 35-50 | 50 | 70 |

In large commercial projects, cables account up to 10% of the system cost, which is higher than the inverter cost.
The Al cable could reduce the BOS cost.

# 04

# Smart Management


# Flexible Communication Options

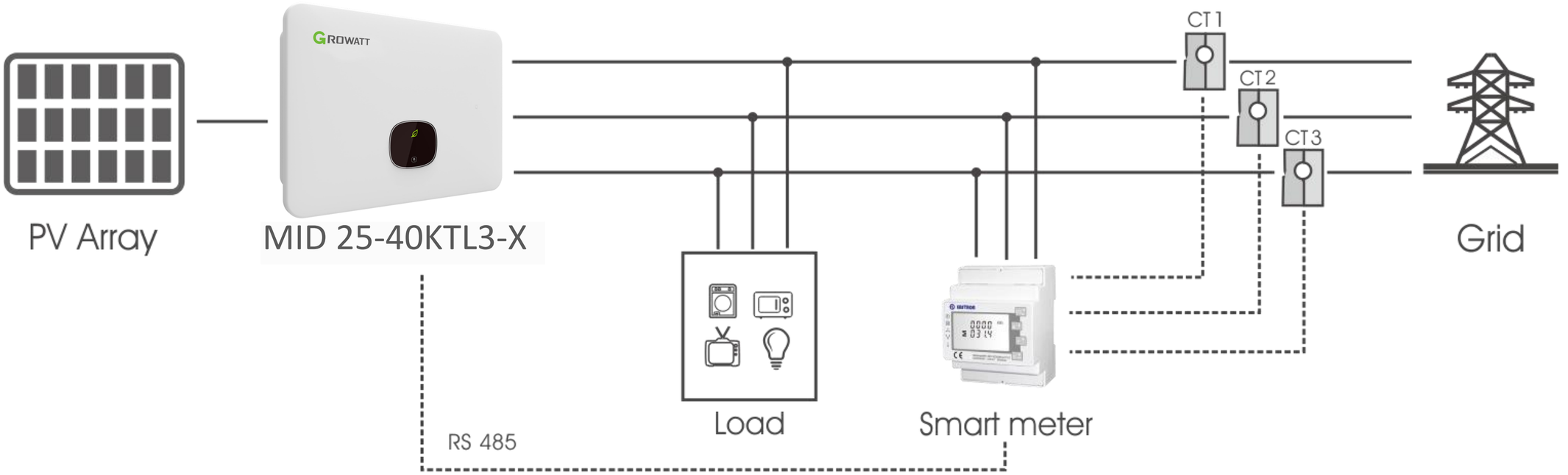
## USB Port

Monitoring: WiFi-X/ShineLink-X/Lan-X/GPRS-X/4G-X
Support online smart service
Local commission: USB-WiFi and USB FW upgrade

## COM Port

ShineMaster/Meter/Ripple control/DRM/
Third party monitoring

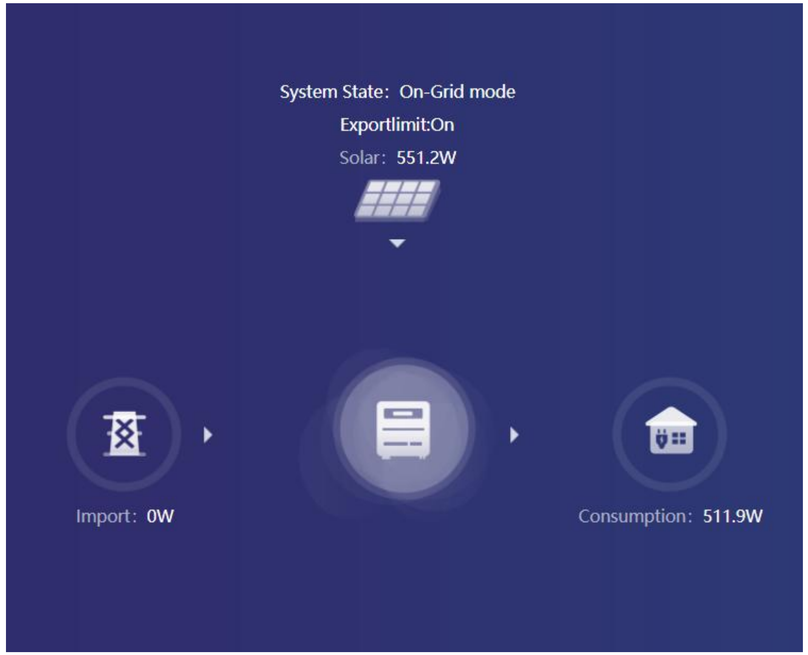
# Dynamic Export Limitation



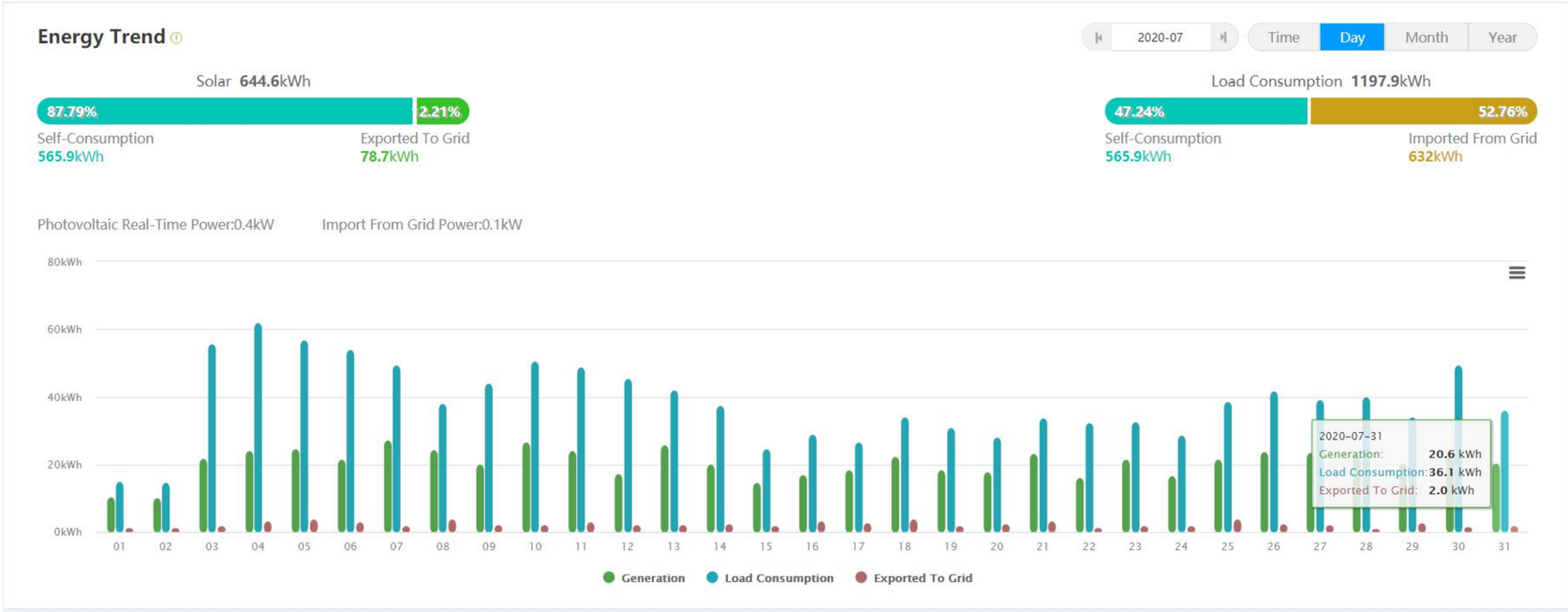

- Growatt Smart Meter is required
- CT meter makes the installation more easier
- Direct connection meter optional

# 24H Self-consumption Monitoring*

Growatt Smart Meter and monitoring device are required.



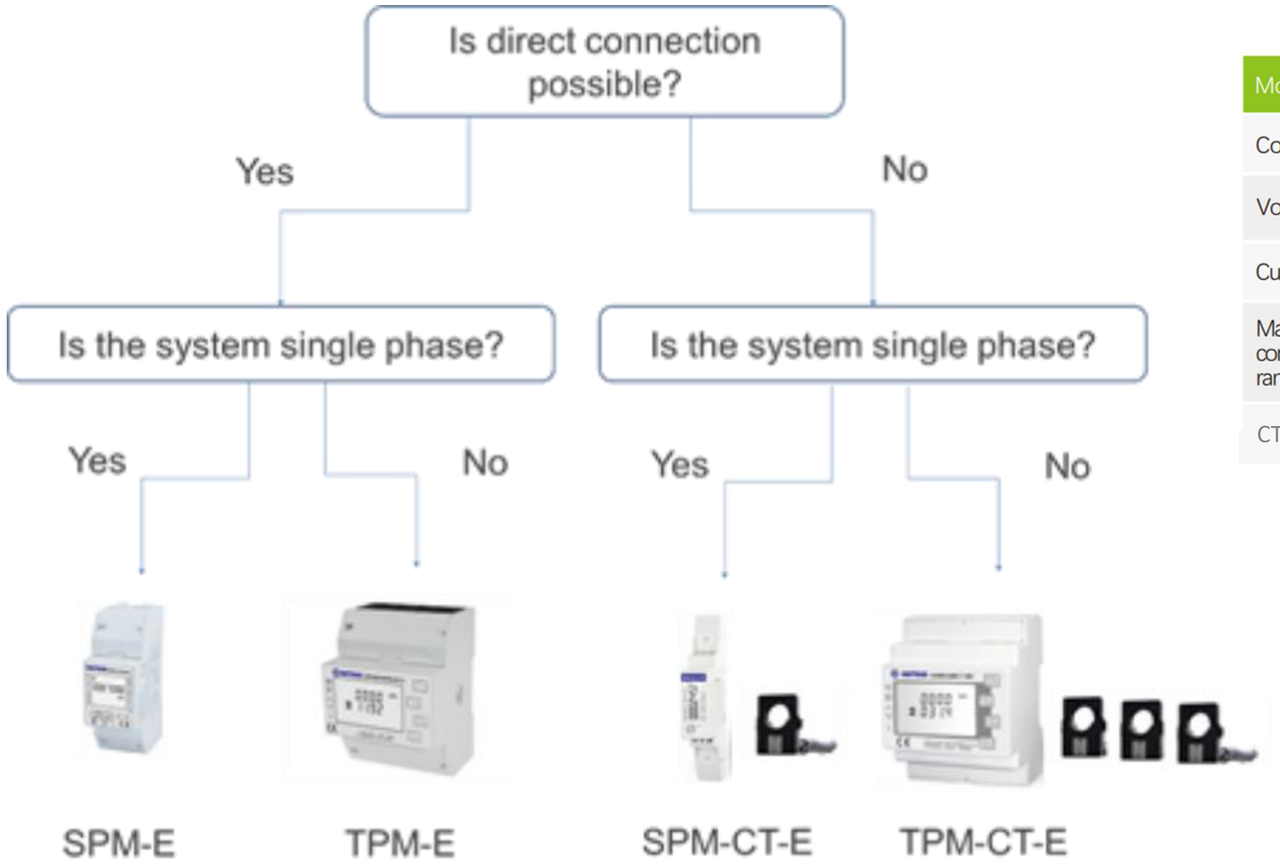

System Overview




Self-consumption Data

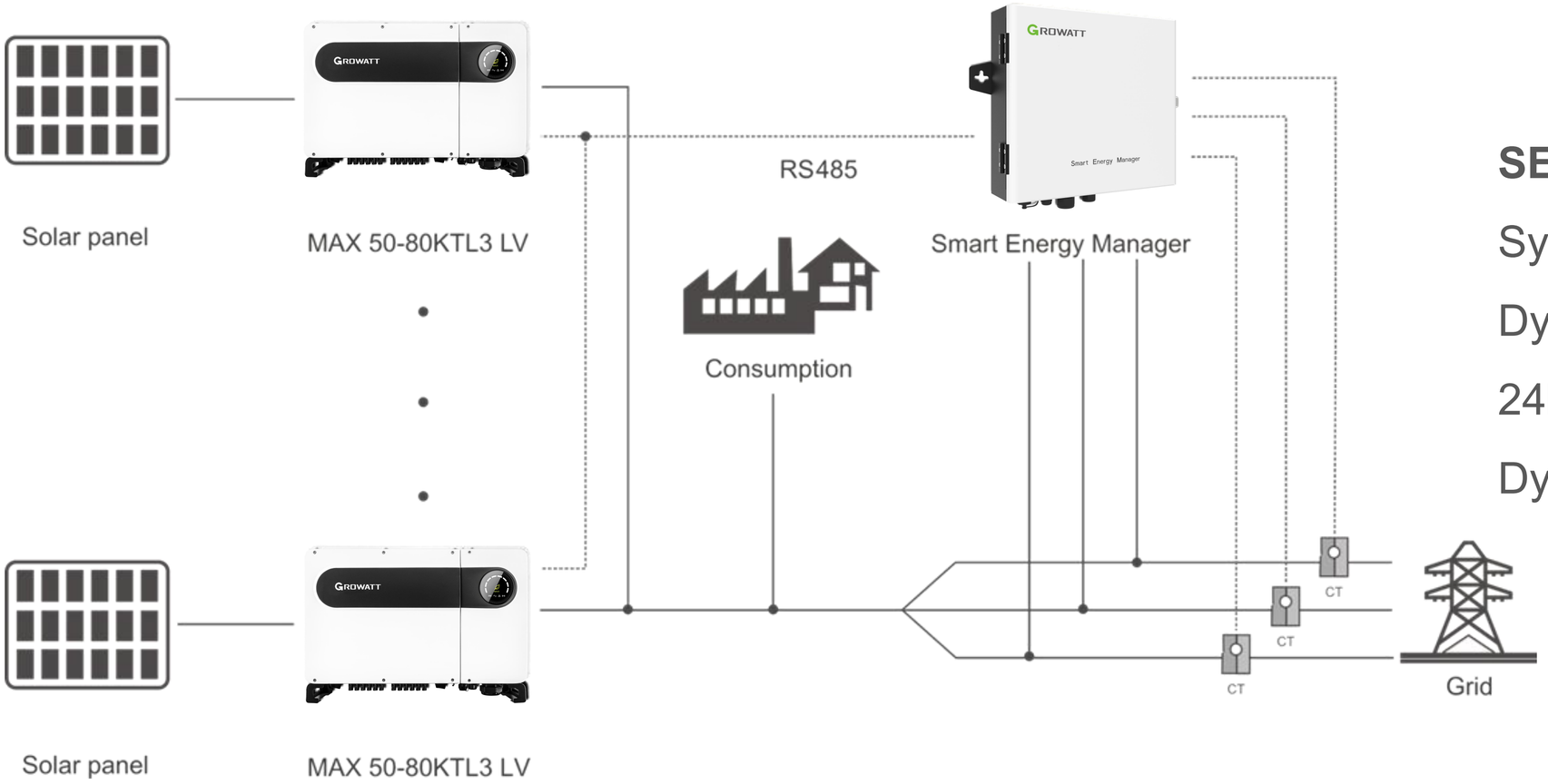
* Function ready in Q3 2021 for MOD and MID

# Meter Solution




| Model | SPM-E | TPM-E | SPM-CT-E | TPM-CT-E |
|---|---|---|---|---|
| Connection | 1P2W | 3P4W | 1P2W | 3P4W |
| Voltage range (L-N) | 176~276V | 100~289V | 176~284V | 100-289V |
| Current | 10A (max.100A) | 10A （max.100A) | 40mA | 40mA |
| Max. RS485 communication range | 100m | 100m | 100m | 100m |
| CT | | | 1CT 100A | 3CTs 100A/250A |

# Multiple Inverters Solution




**SEM**

System monitoring

Dynamic export limitation

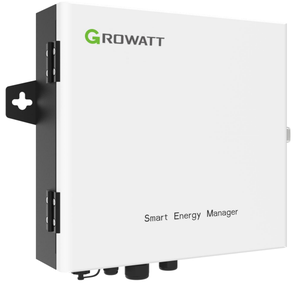
24h self-consumption monitoring

Dynamic PF control

- SEM can control max.32pcs inverters

# Flexible Monitoring Options

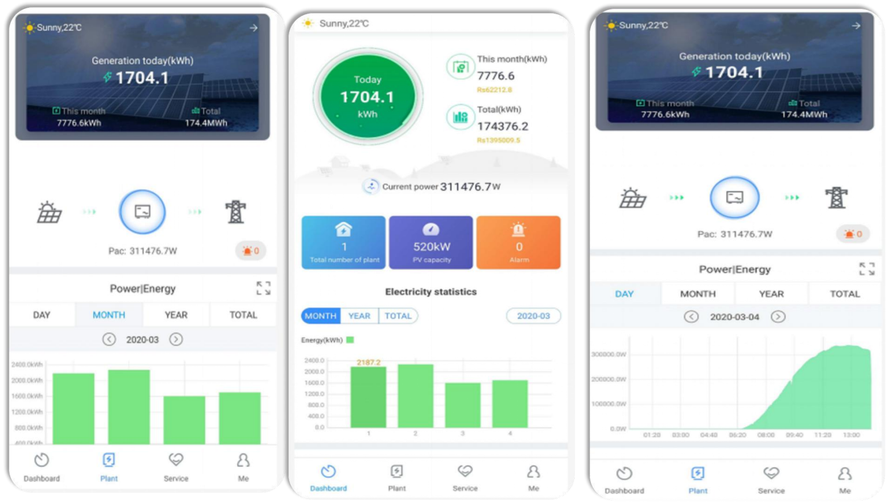


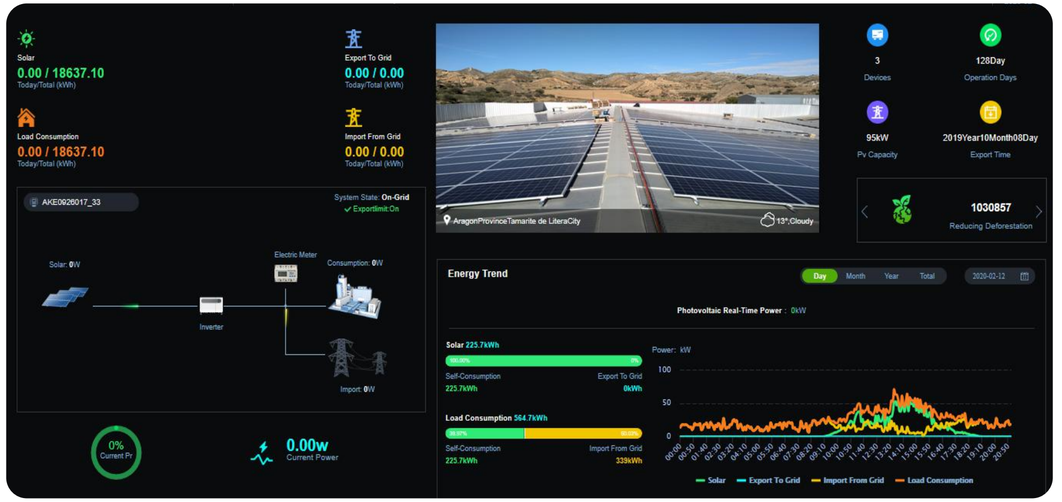



| ShineLAN-X | ShineWiFi-X/4G-X | ShineLink-X | ShineMaster (LAN/4G) | Smart Energy Manager (LAN) |
|---|---|---|---|---|
| • Storage data max 90 days<br>• Plug & Play<br>• Up to 100m | • Storage data max 90 days<br>• Up to 50m<br>• Support remote service<br>• Supports 2G,3G,4G (4G-X) | • Monitoring up to 8 inverters<br>• Storage data max 90 days<br>• Up to 100m<br>• Automatically acquire IP Support remote service<br>• RF communication | • Monitoring 64 inverters<br>• Up to 500m communication<br>• Export limitation option<br>• Automatically acquire IP address<br>• Support remote service<br>• Supports 2G,3G,4G (4G) | • All Shinemaster functions<br>• CTs and meter included<br>• Different CTs sizes<br>• Self consumption monitoring<br>• Real time system diagram<br>• All in one box |

- SEM can control max.32pcs inverters

# Monitoring Portal



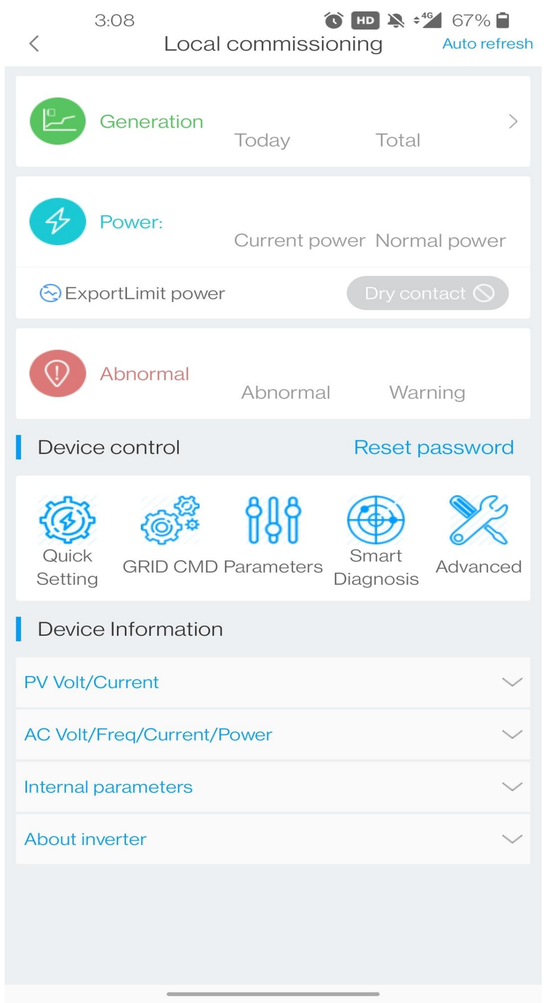

## ShinePhone APP

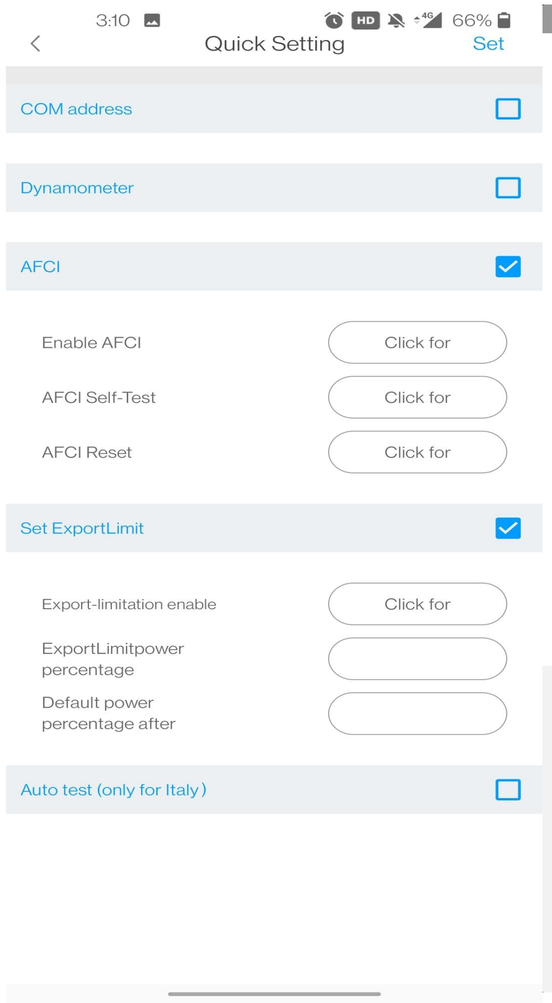
- Plant information
- Easy to set-up plant
- Device management
- Fault display

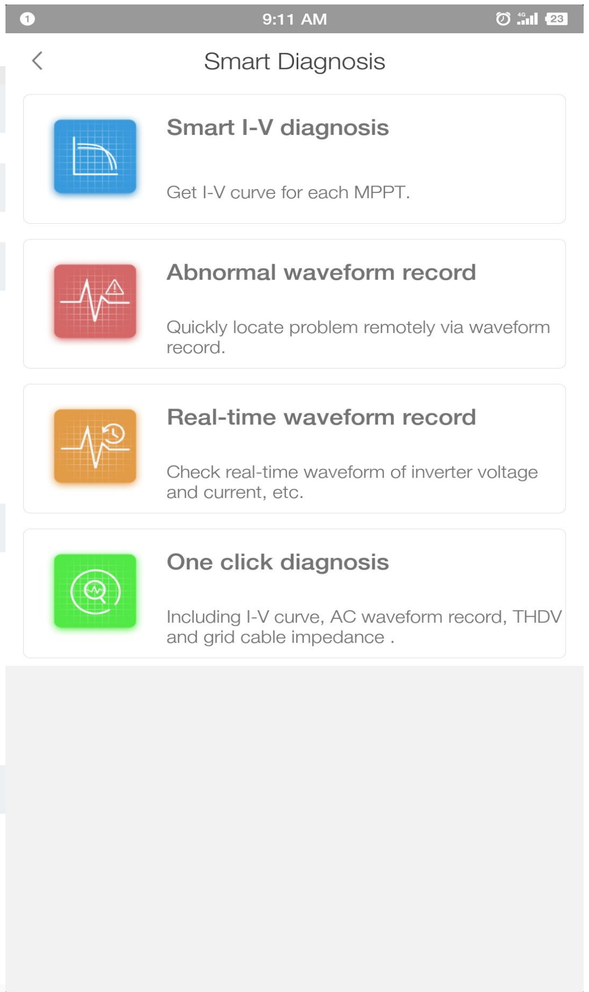
## C&I ShineServer

- Generation display
- Device status monitoring
- Remote O&M
- Online service

# Local commissioning with USB-WiFi




USB-WiFi+ShinePhone
Make it more easier for local commissioning

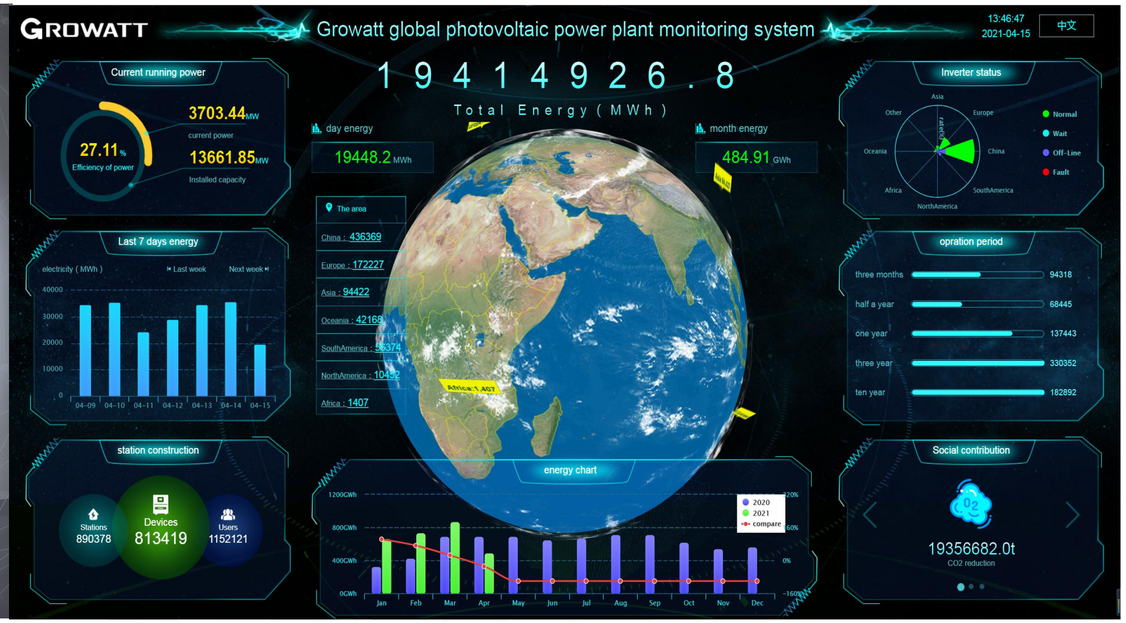
For example:
Turn on/off AFCI
Turn on/off  export limitation
I/V curve scanning

# Online Smart Diagnosis


- Smart I-V diagnosis
- Fault waveform record
- Real-time waveform record

# Smart Maintenance

Fast and easy, saving cost and time, peace in mind.


Configuration via APP

USB-WiFi+ShinePhone App

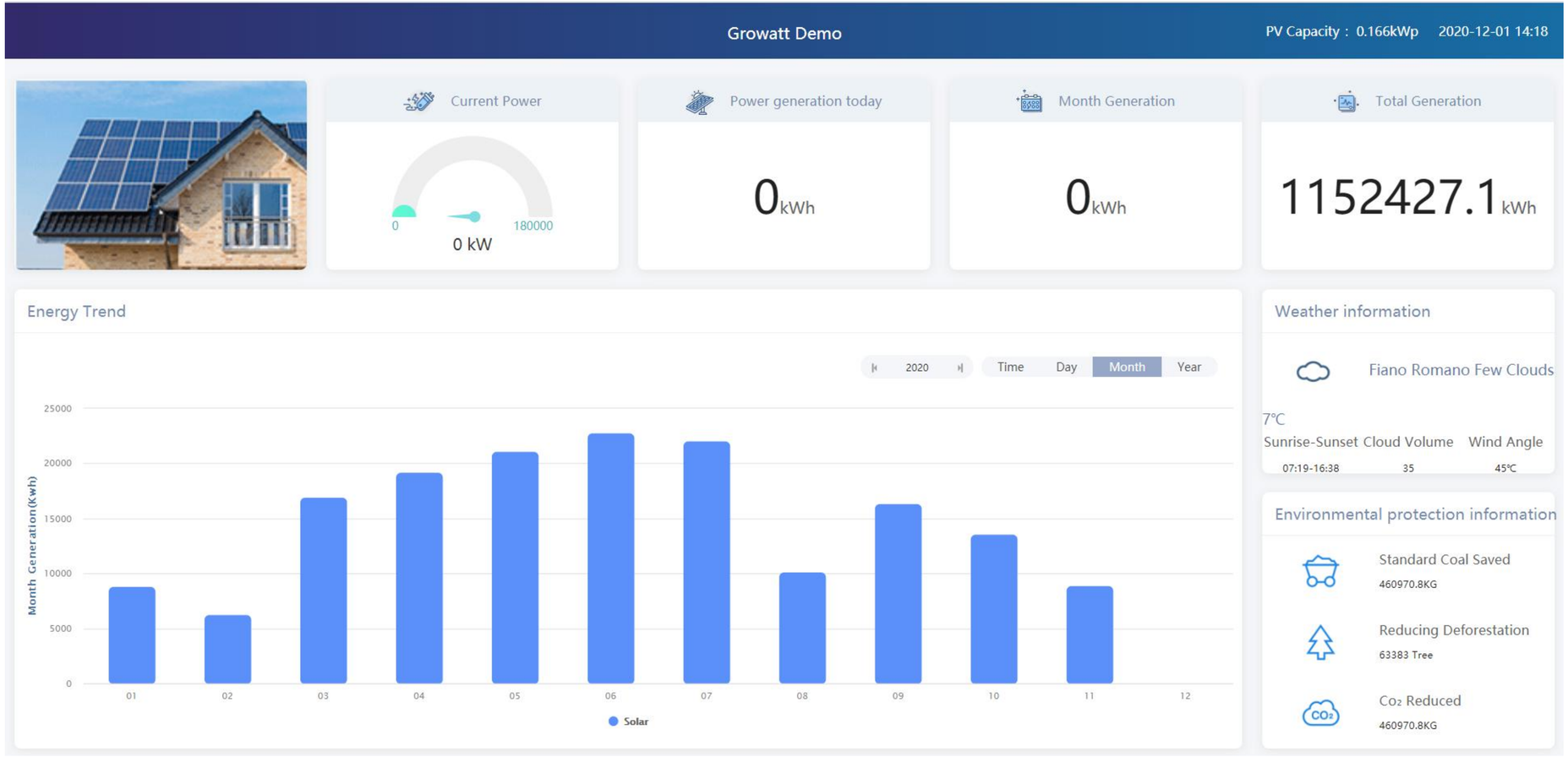
Online Smart Service

Remote Firmware upgrade

Remote diagnose and configuration

# Plant Show page

Create a show page of your PV plant on a big screen.



# 05

# Localized Design for Normay

# Local Standard

## Base on EN50549-1(For 400V)

| | |
|---|---|
| **Applicant:** | Shenzhen Growatt New Energy Technology CO.,Ltd<br>1st East & 3rd Floor of Building A, Building B, Jiayu Industrial Park, #28, GuangHui Road, LongTeng Community, Shiyan Street, Baoan District, Shenzhen, P. R. China |
| **Product:** | PV Grid inverter |
| **Ratings & Principle Characteristics:** | See Appendix to Certificate of Conformity |
| **Models:** | MID 10KTL3-X, MID 12KTL3-X, MID 15KTL3-X, MID 17KTL3-X, MID 20KTL3-X, MID 22KTL3-X, MID 25KTL3-X |
| **Brand Name:** | Growatt |
| **Tested according to:** | EN 50549-1: February 2019<br>Requirements for generating plants to be connected in parallel with distribution networks Part 1: Connection to a LV distribution network - Generating plants up to and including Type B<br>Compliant with COMMISSION REGULATION(EU)2016/631(NC RfG)<br>Type approval for type B |
| **Certificate Issuing Office Name & Address:** | Intertek Testing Services Ltd. Shanghai<br>2/F (West Side), No. 707, Zhangyang Road, Free Trade Experimental Area, Shanghai, P. R. China |
| **Test Reports No:** | 190416198GZU-001 |

Additional information in Appendix.

**Signature**

## Fit Norway according to REN342

**Key Parameter:**

Voltage range: 214V-247V

AC Connection: 3 Wire IT grid

Frequency range:47.5-50Hz

Observation time:60S

Islanding trip time: 0.5S

Over/Under voltage protection(Step 1):

U>247V & U<214V, Trip time: 3S

Over/Under voltage protection(Step 2):

U>264.5V & U<195.5V, Trip time: 0.5S

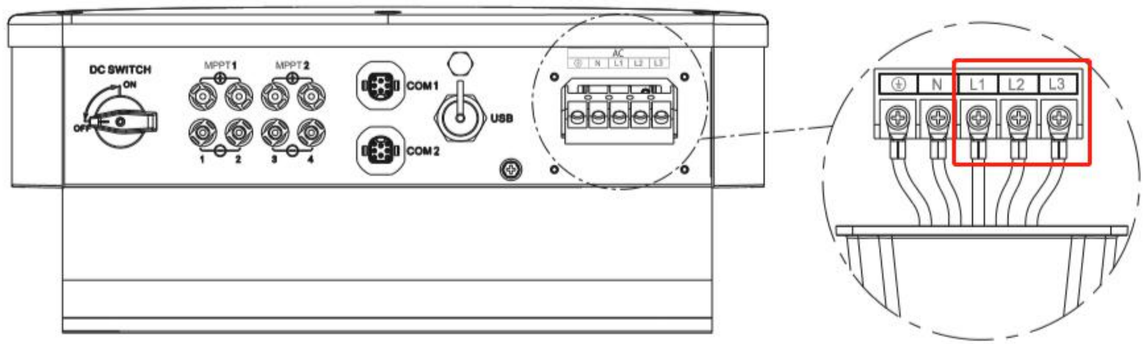
Over/Under frequency protection:

F>52Hz & F<47.5Hz, Trip time: 0.5S

# AC Terminal Connection

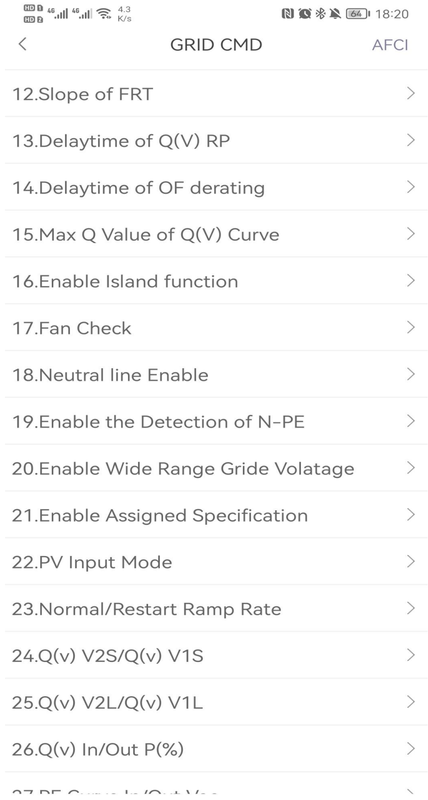
Due to the limit of hardware, the AC port still has 5 terminals. For - XL inverter, customer only need to connect 3 fire line.

The Neutral line could be enabled via Shinephone easily.









# THANKS



Growatt New Energy