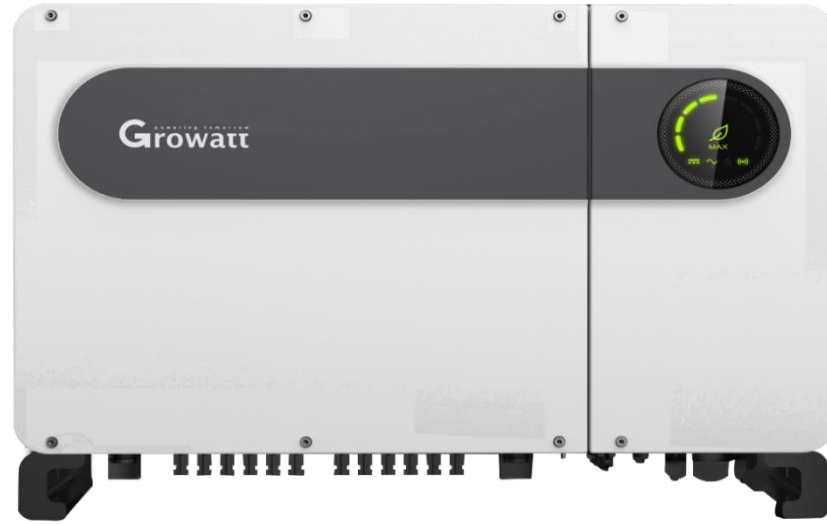


Make The MAX Out Of It

powering tomorrow
Growatt

MAX series 50-80kW new string inverters



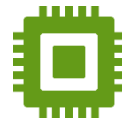
**High
yields**



**Safe
& reliable**



**Smart
& capable**



**Easy
Maintenance**



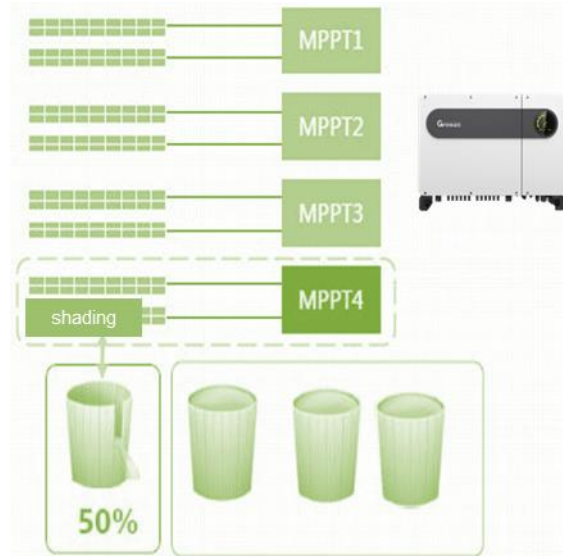
Hill Side



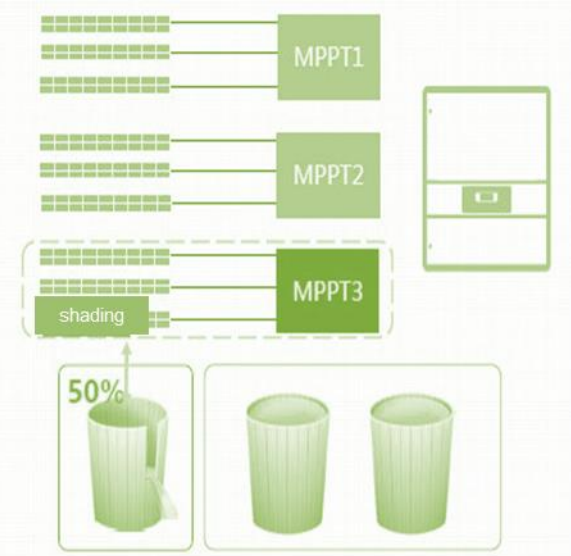
Irregular Roof



2 strings per MPPT



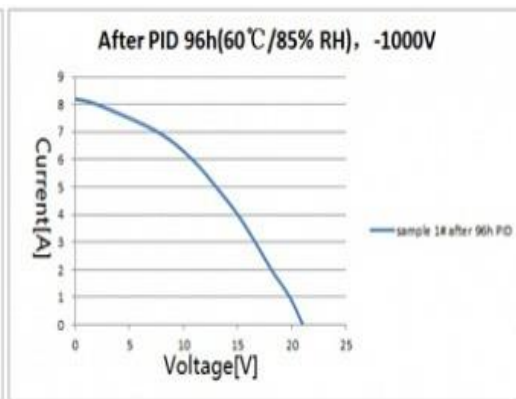
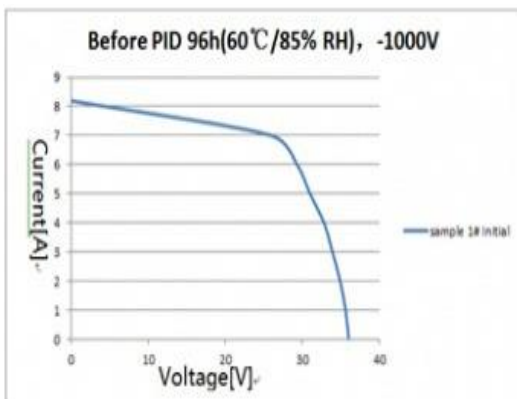
3 or 4 strings per MPPT



More MPPTs, flexible string configuration

Anti-PID— Automatically repair module power loss caused by PID effect at night.

Sample	States	Voc (V)	Isc (A)	Vmp (V)	Imp (A)	Pmax (W)	Power Degradation (%)
0 #	Label	37.37	8.31	29.32	7.84	230.00	N/A
1 #	Initial	36.27	8.23	26.55	6.80	180.48	21.53%
	After PID 96h	21.01	8.07	12.39	5.34	66.13	71.28%
2 #	Initial	35.88	8.21	25.17	6.74	169.73	26.20%
	After Recovery 96h	36.82	8.13	28.97	7.31	211.86	7.89%



Anti-PID Inbuilt

Anti-PID is integrated as a standard configuration, no need external anti-PID device, increases system revenue at the same time saves system cost.

Comprehensive Protections



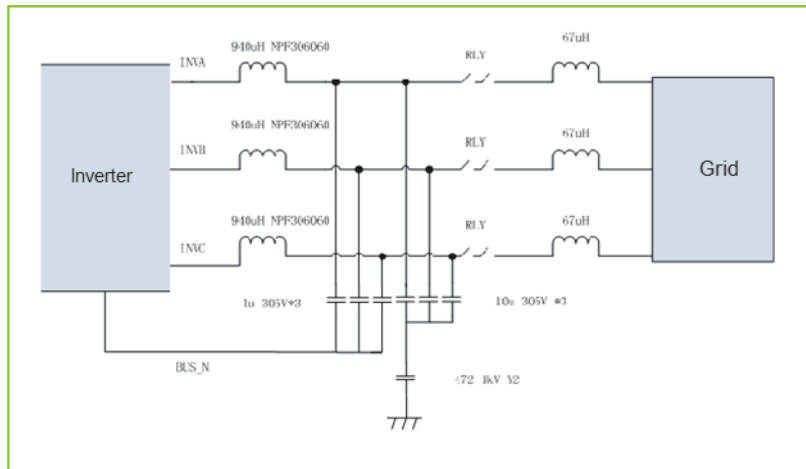
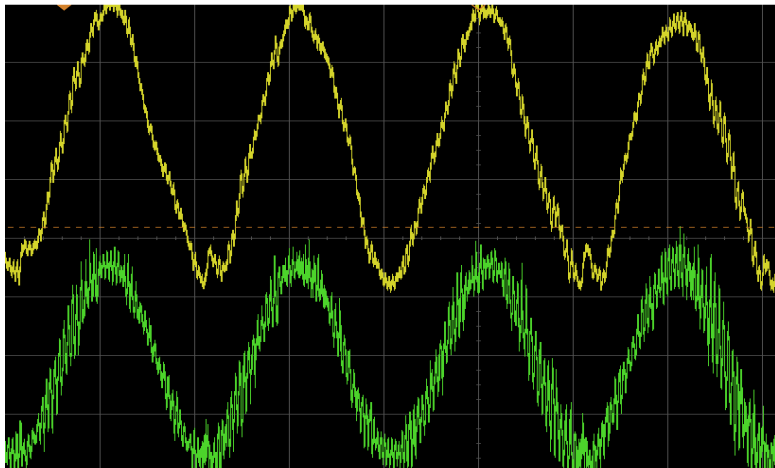
- **Lightning protection**

Type II **SPD** for both AC and DC side for lightning protection

- **Fire protection**

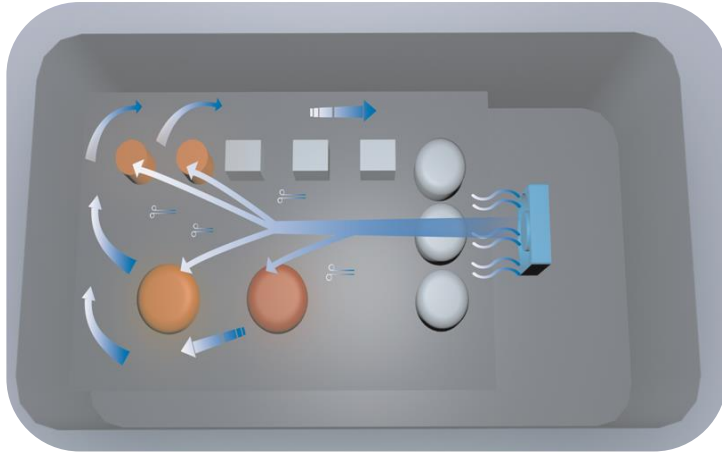
AFCI modular to avoid fires that caused by DC electrical arcs

AC LCL Filter, Better Output Quality



- Better output quality
- More stable
- Support up to 70 paralleling

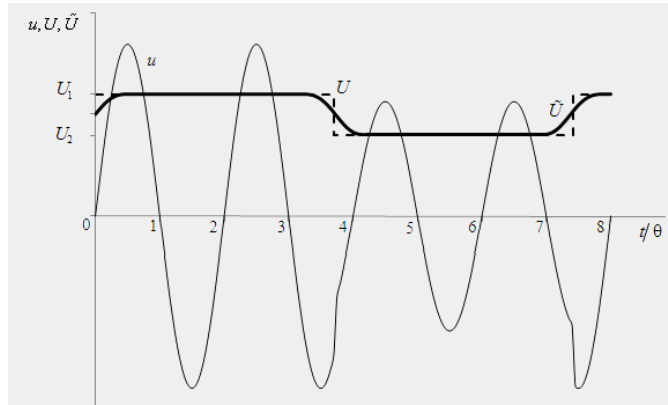
Optimized Heat Performance



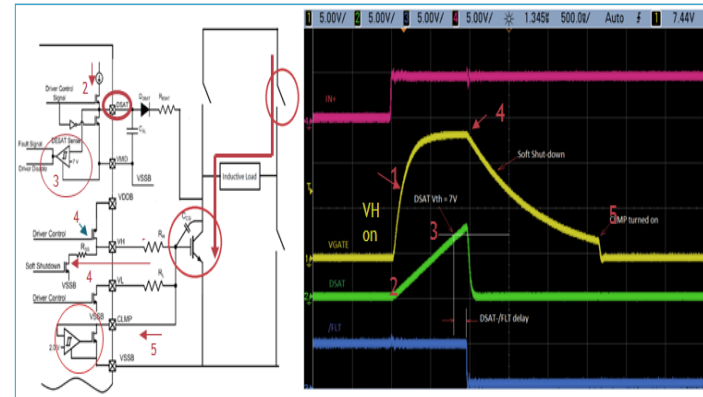
- **Sophisticated air route**
Orderly air circulation, more effective cooling
- **Accurate temperature balancing**
Balance internal environment temperature of inverter
- **Precise heat dissipation**
Avoid over-heat risk of far end components

First-aid Functions

When sudden high voltage fluctuation or inrush current occurs, inverter suppresses surge current to ensure inverter normal operation in preset duration

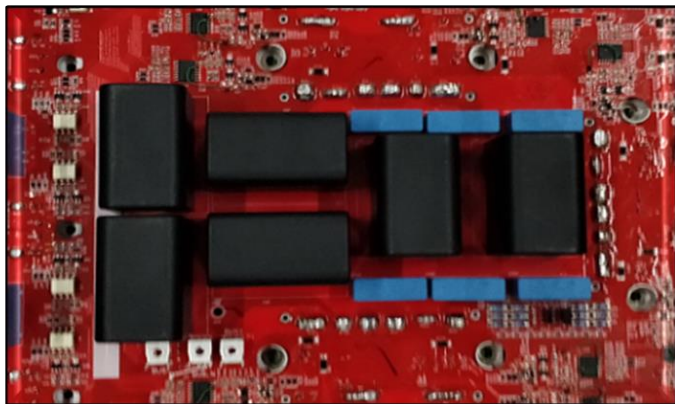


When IGBT is short circuited or with very high surge current, the DESAT function of drive IC (with inbuilt magnetic isolation) will stop PWM immediately to avoid component damage

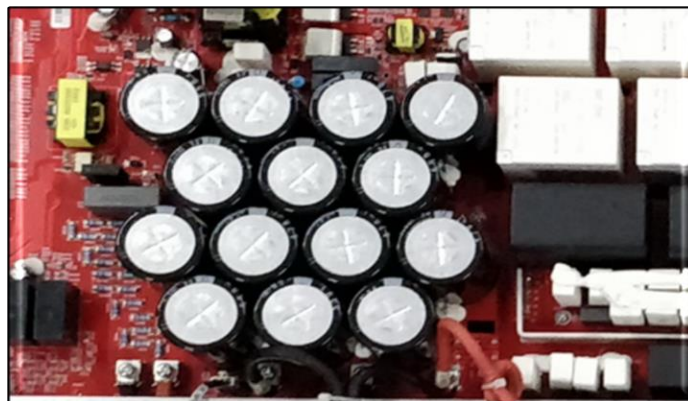


Film-cap & E-cap, Double Insurance

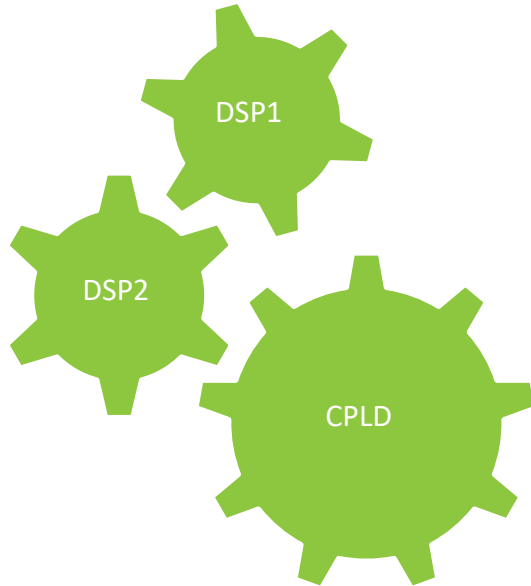
Film-cap is enough to serve as the main capacitor during normal operation, E-cap storage power only, ensures long life span of E-cap



E-cap as the main capacitor when at special occasions such as reactive power compensation which needs high energy support, and film-cap just used to stabilize inverter



Stronger Brain, Smarter Inverter

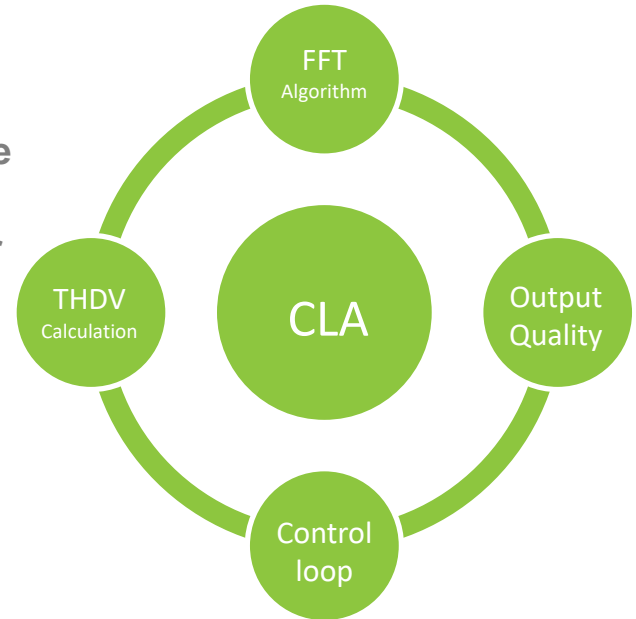


Dual DSP, more reliable

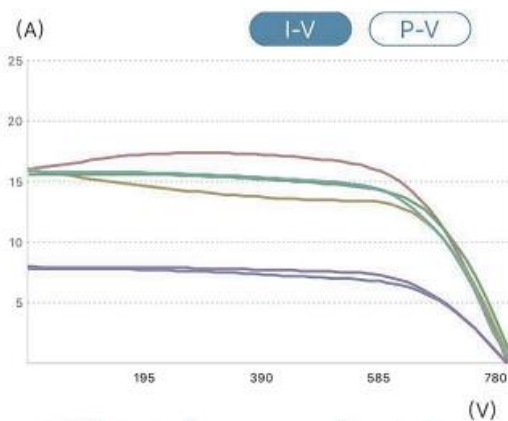
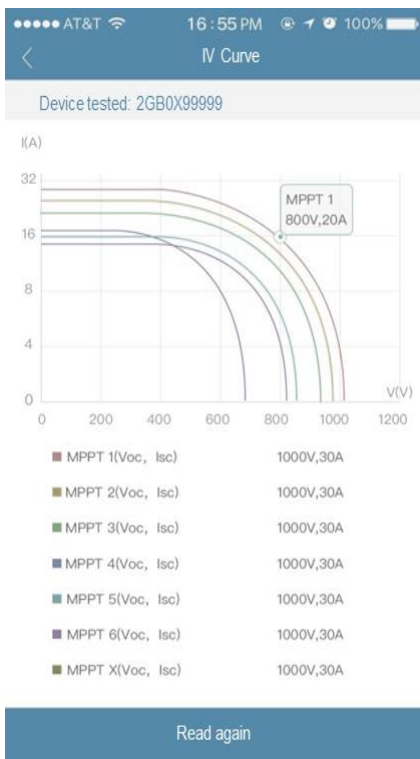
CPLD in parallel, faster

ARM design

Quick communication

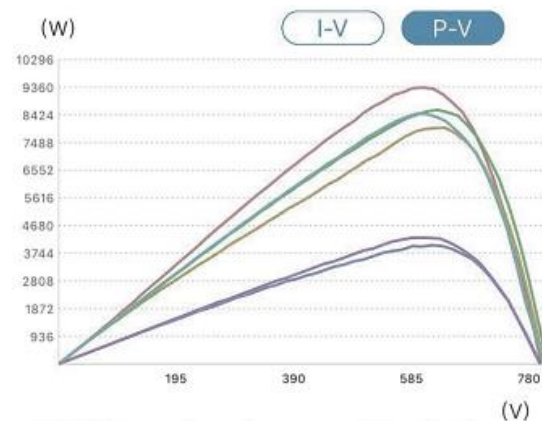


Smart String Monitoring and Smart I-V Diagnosis



String monitoring

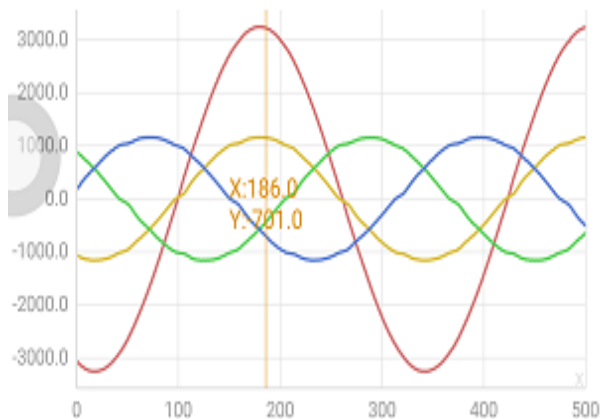
12 strings real-time monitoring, fast local trouble string, improve service speed



Smart I-V diagnosis

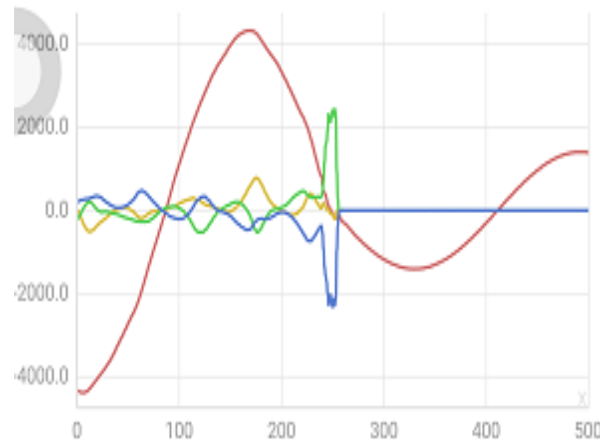
One-click to get I-V curve of each MPPT, local trouble string remotely, no need special equipment.

Smart Waveform Recording



Real-time waveform display

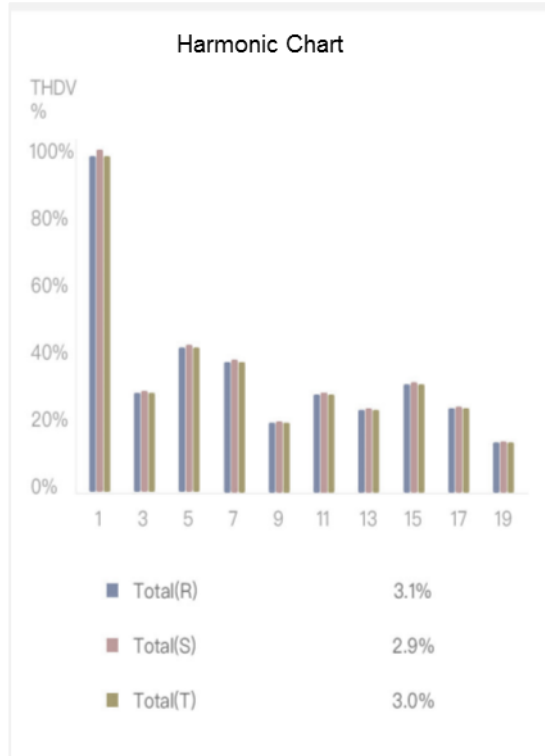
Show real time waveform of DC /AC current and voltage by one click



Fault waveform recording

Set the trigger parameter and when it happen, the waveform will be record, for easy troubleshooting.

One Click Automatic Diagnosis



5 minutes quick diagnosis of overall system information after installation with just one click

- I-V curve of each MPPT
- Grid voltage waveform
- Grid voltage harmonic
- Grid line impedance

Simple Yet Sophisticated LED Display



Energy Panel

Power rate
Error code



PV Status

ON: Normal
OFF: Abnormal



AC Status

ON: Normal
OFF: Abnormal
Flash: Standby



Warning

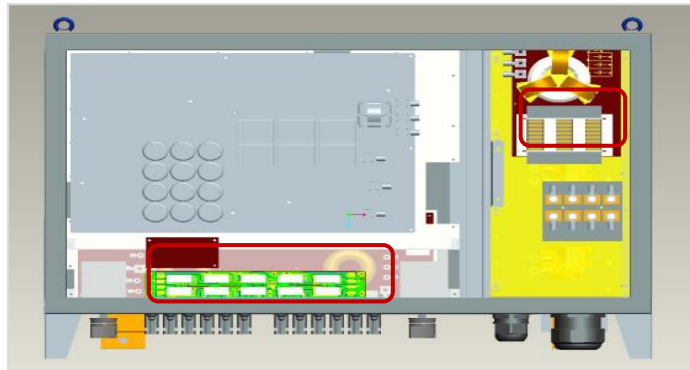
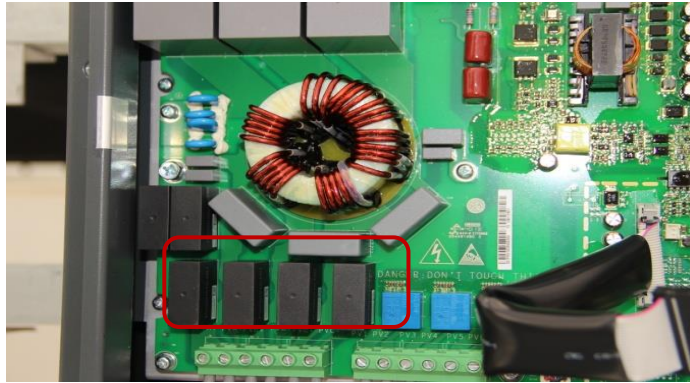
ON: Error
OFF: Normal
Flash: Warning



Communication

ON: Normal
OFF: Abnormal
Flash: FW updating

Independent SPD Board



- **Surge protection on main power board**

When it's broken, you need replace the whole inverter

- **Surge protection on a small board**

It's very easy to replace a small board when it's broken, reduce the maintenance cost and time.

Fuseless Design, Reduce Failure Rate



Failure causes

- Metal heat fatigue
- Soldering melt
- Chemical rust

Failure rate year average

10%-20%

2 strings
each MPPT,
no need
fuse

Faulty string



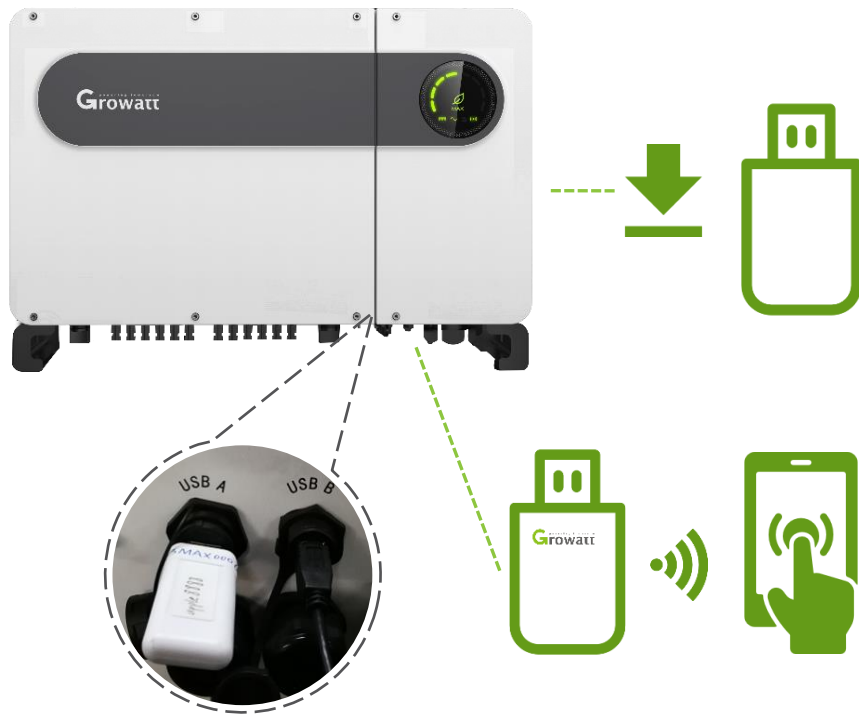
Short current route



Normal string



Smart Local Service



USB A

Flash disk

- Update inverter FW quickly (< 200s)
- Real-time wave data record and fault waveform record
- Record I-V curve data

Note: you must put corresponding script in the USB disk

Local network service

- Wi-Fi stick+ShinePhone APP
- Check real-time waveform and fault waveform record via APP
- Check real time I-V curve
- Set parameter via local Wi-Fi network

Smart Local Service

The screenshot displays the 'ShineBus --Device Info' software interface. The main window is titled 'ShineBus --Device Info' and contains several panels for monitoring and configuration. On the left, there is a sidebar with 'COM:' set to 'COM6', 'BaudRate:' set to '38400', 'INV Addr:' set to '1', and 'Period(ms):' set to '1000'. The main area is divided into several sections:

- System Information:** FF Verion: T11.0(t11A-78791063), Serial No: SARST46005, Device Model: AOBODOT6PFU1M8SA, ModbusVersion: V1.49
- Status Information:** Status Info: Waiting, Countdown: 20, Eac-today: 89.7kWh, Eac-total: 89.7kWh, AC Watt: 0W, AC VA: 0.0VA, FF: 1, PV WorkMode: DC Source, FaultCode: Null, WarnCode: Null
- AC Information:** AC Voltage (V): 384.9, 383.3, 383.3; AC Current (A): 0, 0, 0; AC Power (VA): 0, 0, 0; AC Freq (Hz): 49.98
- PV Information:** Table with columns PV1-PV8 and rows for Voltage (V) and Current (A).
- String Information:** Table with columns Str1-Str16 and rows for Voltage (V) and Current (A).
- PID Information:** Table with columns PID1-PID8 and rows for Voltage (V), Current (mA), and Status.
- SVG/APP:** CT_I (A), CT_Q (Var), CTIAR_I (A), COMP_Q (Var), COMP HAR_I (A), SVG/APP Status: None
- Internal Information:** Volt (V) for +BUS, -BUS, BUS; INV BOOST, Internal1, Internal2; T (°C) for Internal1, Internal2; ISO q(Ω); DerateMode: 7

USB B --- USB cable to laptop

- Comprehensive functions for service and information checking
- Read and set inverter information, parameters, FW updating
- Show real-time waveform and fault waveform record
- Show I-V curve of each MPPT
- One-click automatic diagnosis (I/V curve, AC voltage curve, THDv)

Smart Remote Maintenance, Reduce Cost of On-site Service

Remote Configuration

Set inverter

Inverter
Serial number: 3F16160040 Alias: 3F16160040
Port: 4KZ47142C1 Attributes: AH1.0/ahba0101/1110372

Command

Set PV on/off

Set save PF commands

Set active power rate %

Set reactive power rate %

Set PF value

Set inverter time

Set grid voltage high

Register Value

Remote FW Update

Growatt online upgrade system

Datalog: Inverter: Date: -

No.	Inverter	Datalog	Time	Firmware version	Internal version	Upgrade	Path
1	FPA2702005	4KZ370139D	2017-10-09 16:28:19	TH1.0	thaa0504	datalog connect time out	/ShinePano/Rudolf - Growatt Germ.
2	FPA2702005	4KZ370139D	2017-10-09 16:08:53	TH1.0	thaa0504	user cancel or datalog connect tim...	/ShinePano/Rudolf - Growatt Germ.
3	FPA2702005	4KZ370139D	2017-10-09 15:28:22	TH1.0	thaa0504	downloading firmware to datalog...	/ShinePano/Rudolf - Growatt Germ.
4	FPA2702005	4KZ370139D	2017-10-09 15:28:22	TH1.0	thaa0504	set datalog 4KZ370139D set pv de...	/ShinePano/Rudolf - Growatt Germ.
5	FPA2702005	4KZ370139D	2017-10-09 15:28:22	TH1.0	thaa0504	set datalog 4KZ370139D set pv de...	/ShinePano/Rudolf - Growatt Germ.
6	FPA2702005	4KZ370139D	2017-10-09 15:30:59	TH1.0	thaa0504	New inverter firmware upgrade	/ShinePano/Rudolf - Growatt Germ.
7	HEB1713001	4KZ3646089	2017-10-01 18:28:40	TH1.0	thaa0507	The user canceled the upgrade	/ShinePano/thaa-XX07/thaa-xx07 ...
8	HEB1713001	4KZ3646089	2017-10-01 18:28:30	TH1.0	thaa0507	逆变器升级成功	/ShinePano/thaa-XX07/thaa-xx07 ...
9	HEB1713001	4KZ3646089	2017-10-01 18:28:25	TH1.0	thaa0507	逆变器升级成功	/ShinePano/thaa-XX07/thaa-xx07 ...
10	HEB1713001	4KZ3646089	2017-10-01 18:28:21	TH1.0	thaa0507	逆变器升级成功	/ShinePano/thaa-XX07/thaa-xx07 ...

Growatt service engineer almost can handle 60%+ problems by remote configuration and FW update without on-site service, saving time and cost for installers and distributors.