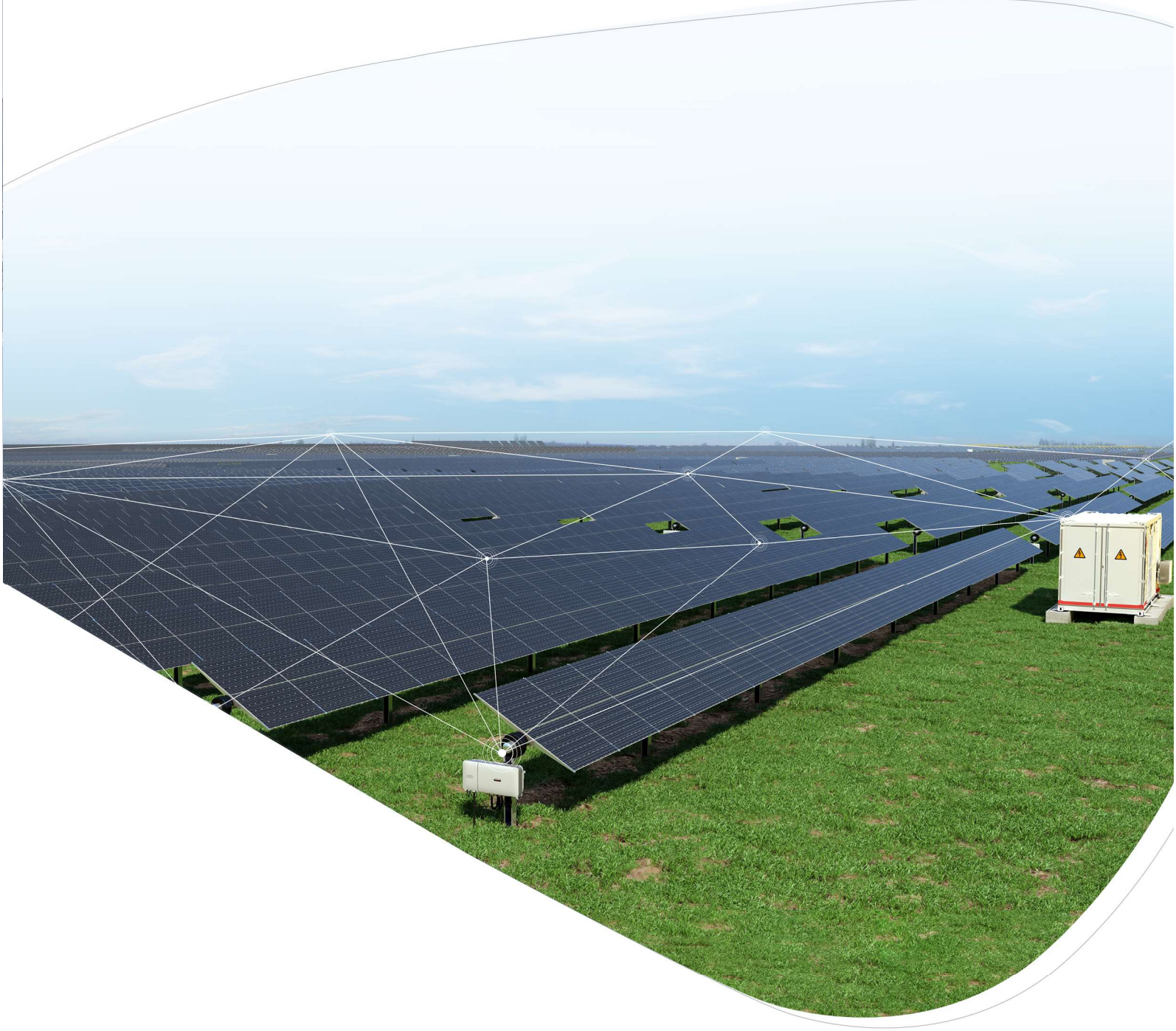


FusionSolar
Utility Smart PV Solution

HUAWEI

HUAWEI

About Huawei

Huawei is a leading global provider of information and communications technology (ICT) infrastructure and smart devices.

With integrated solutions across four key domains – telecom networks, IT, smart devices, and cloud services – we are commit- ted to bringing digital to every person, home and organization for a fully connected, intelligent world. Huawei's end-to-end portfolio of products, solutions and services are both competitive and secure. Through open collaboration with ecosystem partners, we create lasting value for our customers, working to empower people, enrich home life, and inspire innovation in organizations of all shapes and sizes. At Huawei, innovation focuses on customer needs. We invest heavily in basic research, concentrating on technological breakthroughs that drive the world forward.

Employees
195,000+

R&D Personnel
107,000+

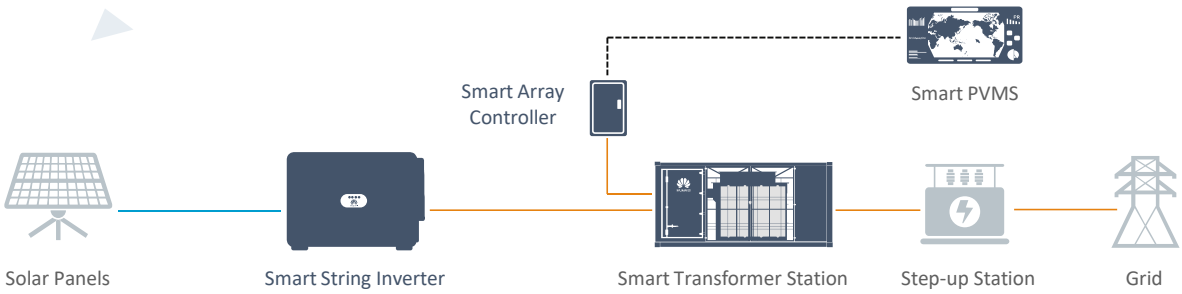
Countries
170+

Brand Finance Global 500
9

Fortune Global 500
44

R&D Investment
2

FusionSolar Smart PV Solution



Higher Yields	Smart O&M	Safe & Reliable	Grid-Friendly
>2% Higher *	Lower OPEX	25-year's Reliability	Grid Forming

* According to TUV Technical Due Diligence Report in 220MW PV Plant

SUN2000-330KTL-H1

Smart String Inverter

Max. Efficiency ≥99.0%

Smart Self Clean Fan

Smart DC Connector Temperature Detect

Smart String Level Disconnection

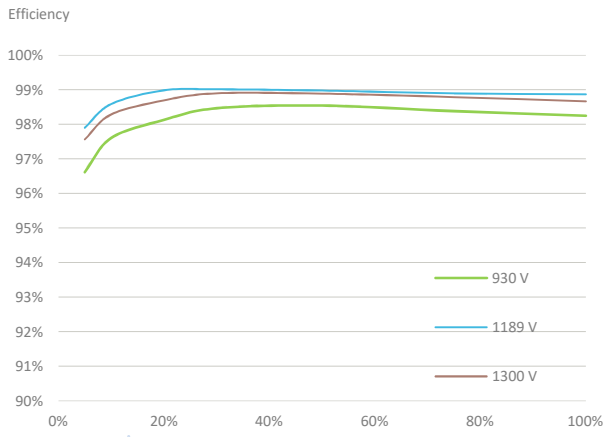
28 High Accuracy String Current Detect

Support IV diagnosis

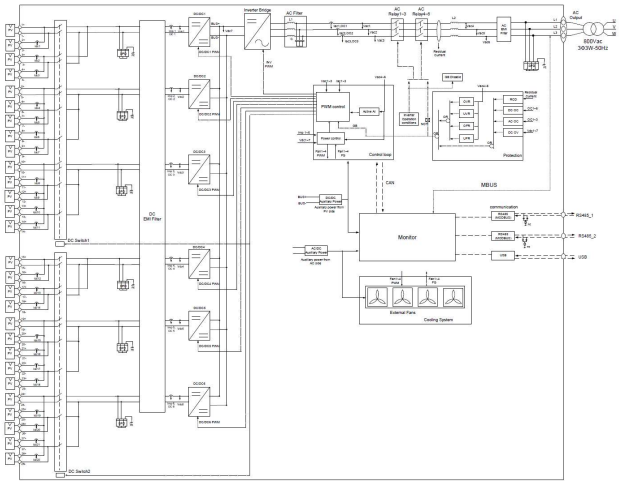
IP 66 protection

Surge Arresters for DC & AC

Efficiency Curve



Circuit Diagram



Technical Specifications

Efficiency	
Max. Efficiency	≥99.0%
European Efficiency	≥98.8%
Input	
Max. Input Voltage	1,500 V
Number of MPP Trackers	6
Max. Current per MPPT	65 A
Max. Short Circuit Current per MPPT	115 A
Max. PV Inputs per MPPT	4/5/5/4/5/5
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
Output	
Nominal AC Active Power	300,000 W
Max. AC Apparent Power	330,000 VA
Max. AC Active Power (cosϕ=1)	330,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	216.6 A
Max. Output Current	238.2 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Total Harmonic Distortion	< 1%
Protection	
Smart String-Level Disconnector(SSLD)	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
AC Grounding Fault Protection	Yes
Residual Current Monitoring Unit	Yes
Communication	
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
General	
Dimensions (W x H x D)	1,048 x 732 x 395 mm
Weight (with mounting plate)	≤112 kg
Operating Temperature Range	-25 ℃ ~ 60 ℃
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m （13,123 ft.）
Relative Humidity	0 ~ 100%
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP 66
Topology	Transformerless

SUN2000-215KTL-H3

Smart String Inverter

100A
Per MPPT

Max. Efficiency
≥99.0%

Smart String-Level
Disconnector

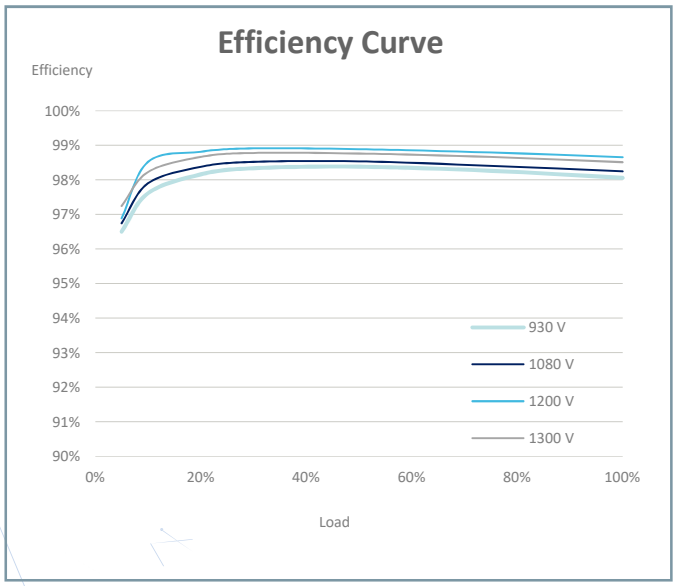
Smart I-V Curve Diagnosis
Supported

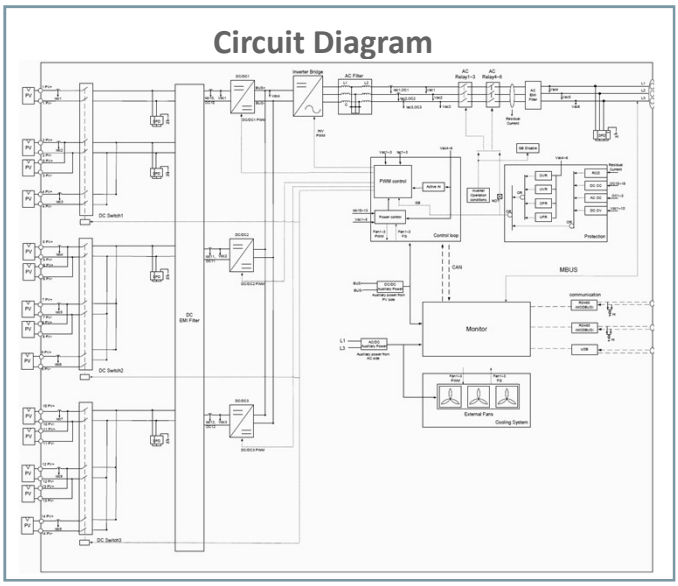
MBUS
Supported

Fuse Free
Design

Surge Arresters for
DC & AC

IP66
Protection





Technical Specifications

Efficiency	
Max. Efficiency	≥99.0%
European Efficiency	≥98.8%
Input	
Max. Input Voltage	1,500 V
Number of MPP Trackers	3
Max. Current per MPPT	100A/100A/100A
Max. PV Inputs per MPPT	4/5/5
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
Output	
Nominal AC Active Power	200,000 W
Max. AC Apparent Power	215,000 VA
Max. AC Active Power (cosϕ=1)	215,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	144.4 A
Max. Output Current	155.2 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	< 1%
Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Communication	
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
General	
Dimensions (W x H x D)	1,035 x 700 x 365 mm (40.7 x 27.6 x 14.4 inch)
Weight (with mounting plate)	≤86 kg (191.8 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Staubli MC4 EVO2
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP66
Topology	Transformerless

SUN2000-215KTL-H0

Smart String Inverter

9
MPP Trackers

Max. Efficiency
≥99.0%

Smart String-Level
Disconnector

Smart I-V Curve Diagnosis
Supported

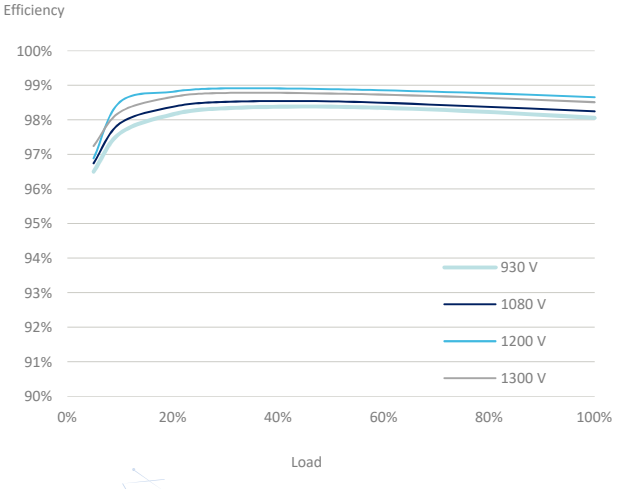
MBUS
Supported

Fuse Free
Design

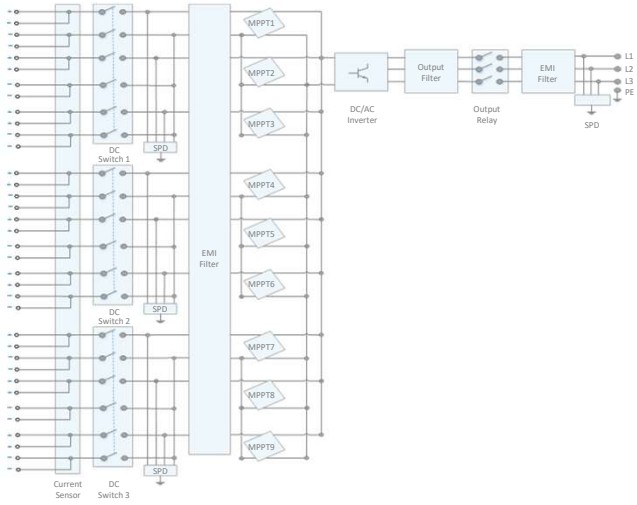
Surge Arresters for
DC & AC

IP66
Protection

Efficiency Curve



Circuit Diagram



Technical Specifications

Efficiency	
Max. Efficiency	99.00%
European Efficiency	98.80%
Input	
Max. Input Voltage	1,500 V
Max. Current per MPPT	30 A
Max. Short Circuit Current per MPPT	50 A
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
Number of Inputs	18
Number of MPP Trackers	9
Output	
Nominal AC Active Power	200,000 W
Max. AC Apparent Power	215,000 VA
Max. AC Active Power (cosφ=1)	215,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	144.4 A
Max. Output Current	155.2 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	< 3%
Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Communication	
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
General	
Dimensions (W x H x D)	1,035 x 700 x 365 mm (40.7 x 27.6 x 14.4 inch)
Weight (with mounting plate)	≤86 kg (189.6 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Staubli MC4 EVO2
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP66
Topology	Transformerless

SUN2000-185KTL-H1

Smart String Inverter

9
MPP Trackers

Max. Efficiency
≥99.0%

Smart String-Level
Disconnector

Smart I-V Curve Diagnosis
Supported

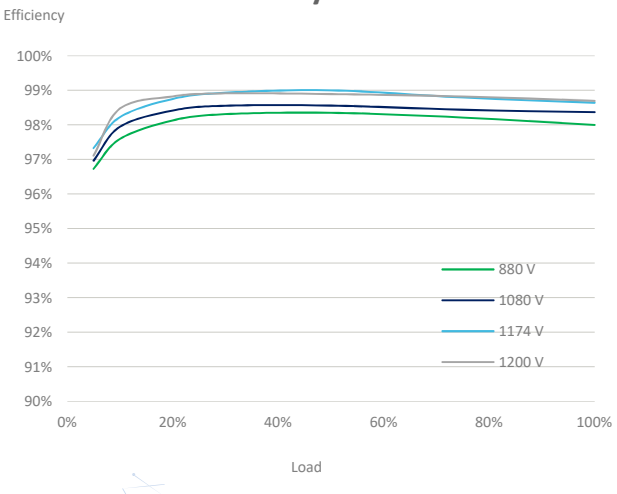
MBUS
Supported

Fuse Free
Design

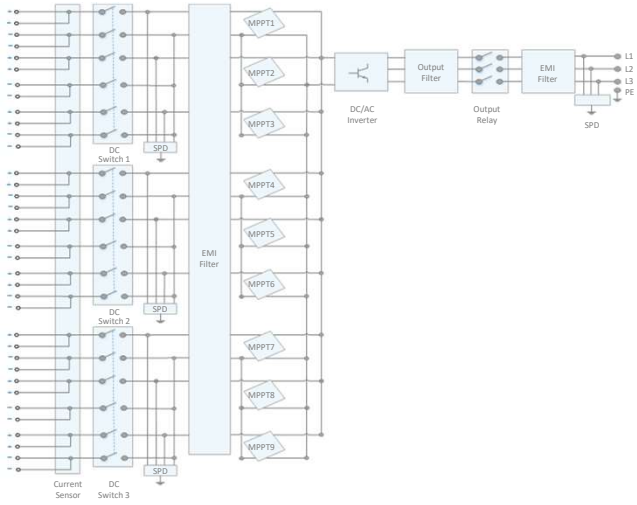
Surge Arresters for
DC & AC

IP66
Protection

Efficiency Curve



Circuit Diagram

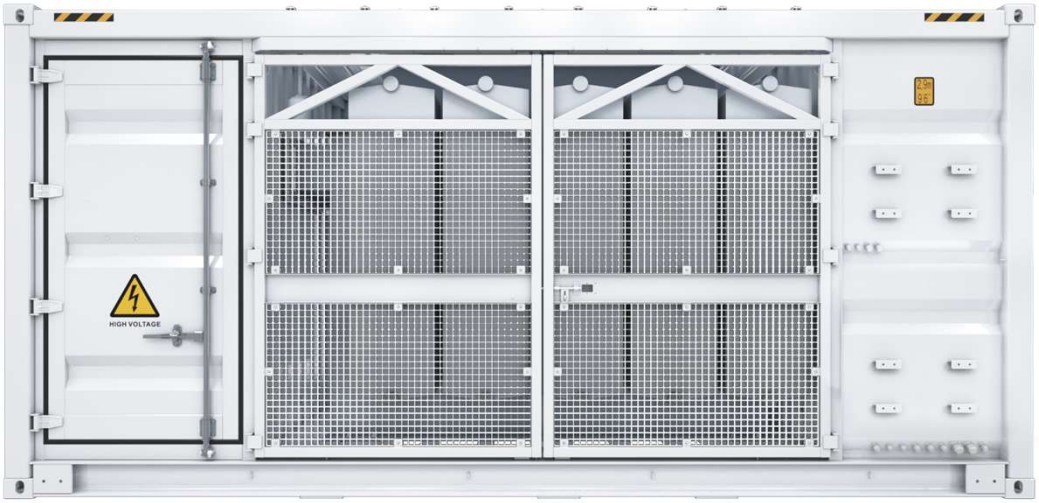


Technical Specifications

Efficiency	
Max. Efficiency	99.03%
European Efficiency	98.69%
Input	
Max. Input Voltage	1,500 V
Max. Current per MPPT	26 A
Max. Short Circuit Current per MPPT	40 A
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
Number of Inputs	18
Number of MPP Trackers	9
Output	
Nominal AC Active Power	175,000 W @40°C
Max. AC Apparent Power	185,000 VA
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	126.3 A @40°C
Max. Output Current	134.9 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	< 3%
Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Communication	
Display	LED Indicators, Bluetooth/WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
General	
Dimensions (W x H x D)	1,035 x 700 x 365 mm (40.7 x 27.6 x 14.4 inch)
Weight (with mounting plate)	84 kg (185.2 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Staubli MC4 EVO2
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP66
Topology	Transformerless
Standard Compliance (more available upon request)	
Certificates	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683, IEC 61727, IEC 62910, P.O. 12.3, RD 1699, RD 661, RD 413, RD 1565, RD 1663, ABNT NBR 16149, ABNT NBR 16150, ABNT NBR IEC 62116

JUPITER-9000K-H0

Smart Transformer Station



Simple

Prefabricated and Pre-tested, No Internal Cabling Needed Onsite
Compact 20’ HC Container Design for Easy Transportation

Efficient

High Efficiency Transformer for Higher Yields
Lower Self-consumption for Higher Yields

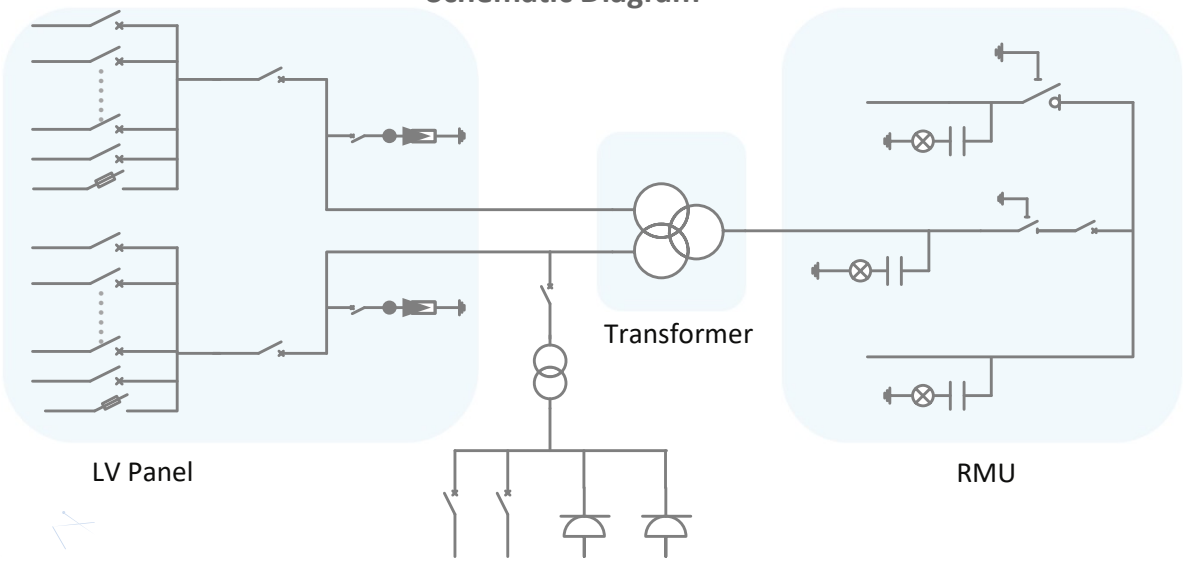
Smart

Real-time Monitoring of Transformer, LV Panel and RMU
High Precision Sensor of LV Electricity Parameters
Remote Control of ACB and MV Circuit Breaker

Reliable

Robust Design against Harsh Environments
Optimal Cooling Design for High Availability and Easy O&M
Comprehensive Tests from Components, Device to Solution

Schematic Diagram



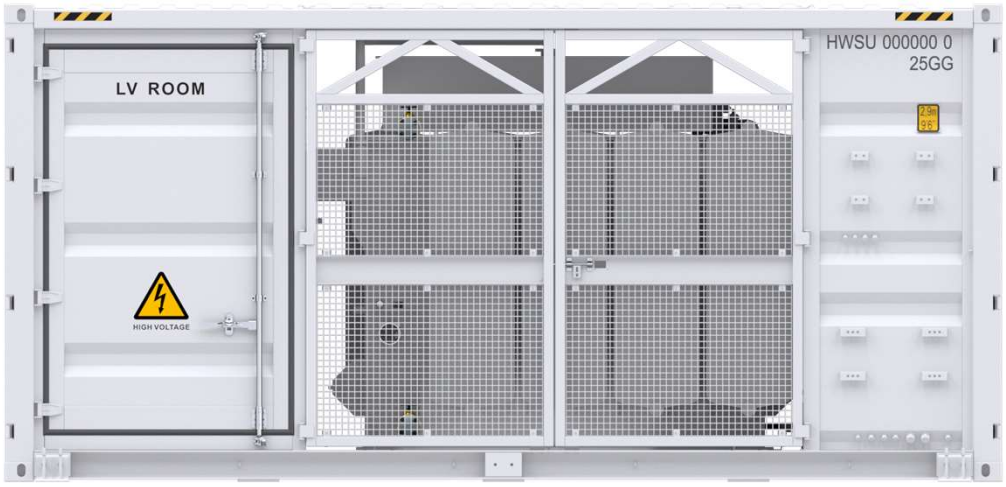
Technical Specifications

Input		
Available Inverters	SUN2000-200KTL / SUN2000-215KTL / SUN2000-185KTL / LUNA2000-200KTL	
Max. LV AC Inputs	44	
AC Power	9,000 kVA @40°C / 8,250 kVA @50°C [1]	
Rated Input Voltage	800 V	
LV Main Inputs	ACB (4000 A / 800 V / 3P, 2 x 1 pcs), MCCB (250 A / 800 V / 3P, 2 x 22 pcs)	
Output		
Rated Output Voltage	22 kV, 30 kV, 33 kV, 35 kV [2]	34.5 kV [2]
Frequency	50 Hz	60 Hz
Transformer Type	Oil-immersed, Conservator Type	
Transformer Cooling Type	ONAN	
Transformer Tappings	± 2 x 2.5%	
Transformer Oil Type	Mineral Oil (PCB Free)	
Transformer Vector Group	Dy11-y11	
Transformer Min. Peak Efficiency Index	Tier 1 or Tier 2 In Accordance with EN 50588-1	
RMU Type	SF_6 Gas Insulated	
RMU Transformer Protection Unit	MV Vacuum Circuit Breaker Unit	
RMU Cable Incoming / Outgoing Unit	Direct Cable Unit or Cable Load Break Switch Unit	
Auxiliary Transformer	Dry Type Transformer, 3 kVA, li0	
Output Voltage of Auxiliary Transformer	400 / 230 Vac or 220 / 127 Vac	
Protection		
Transformer Monitoring & Protection	Oil Level, Oil Temperature, Oil Pressure and Buchholz	
Protection Degree of MV & LV Room	IP 54	
Internal Arcing Fault of RMU	IAC A 20 kA 1s	
MV Relay Protection	50/51, 50N/51N	
LV Overvoltage Protection	Type I+II	
Anti-rodent Protection	C5 Medium in accordance with ISO 12944	
Features		
2 kVA UPS	Optional [3]	
MV Surge Arrester for MV VCB	Optional [3]	
General		
Dimensions (W x H x D)	6,058 x 2,896 x 2,438 mm (20' HC Container)	
Weight	< 28 t	
Operating Temperature Range	-25°C ~ 60°C [4] (-13°F ~ 140°F)	
Relative Humidity	0% ~ 95%	
Max. Operating Altitude	2,000 m [5]	
MV-LV AC Connections	Prewired and Pretested, No Internal Cabling Onsite	
LV & MV Room Cooling	Smart Cooling without Air-across for Higher Availability	
Communication	Modbus TCP, Preconfigured with SmartACU2000D	
Applicable Standards	IEC 62271-202, EN 50588-1, IEC 60076, IEC 62271-200, IEC 61439-1	

1 - More detailed AC power of STS, please refer to the de-rating curve.
2 - Rated output voltage from 10 kV to 35 kV, more available upon request
3 - Extra expense needed for optional features which standard product doesn't contain, more options upon request.
4 -When ambient temperature ≥55°C, awning shall be equipped for STS on site by customer.
5- For higher operating altitude, pls consult with Huawei.

STS-6000K-H1

Smart Transformer Station



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Lower Self-consumption for Higher Yields

Smart

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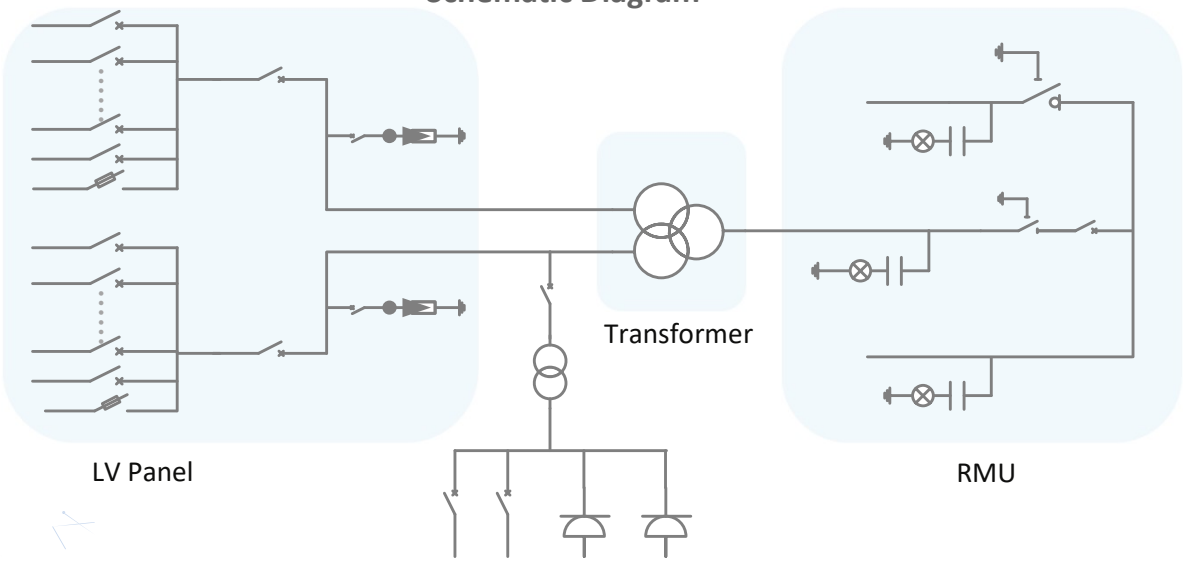
High Precision Sensor of LV Electricity Parameters
Remote Control of ACB and MV Circuit Breaker

Reliable

Robust Design against Harsh Environments
Optimal Cooling Design for High Availability and Easy O&M
Comprehensive Tests from Components, Device to Solution

Schematic Diagram



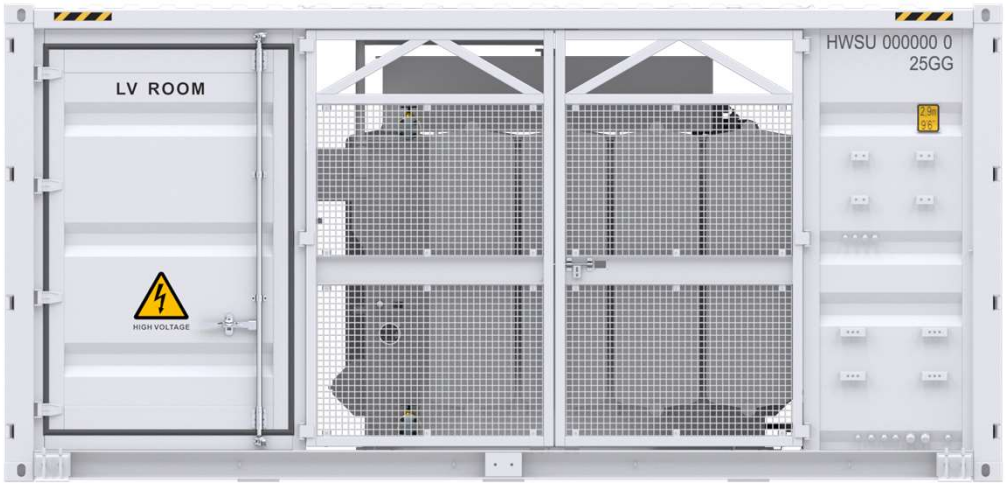
Technical Specifications

Input		
Available Inverters / PCS	SUN2000-200KTL / SUN2000-215KTL / SUN2000-185KTL / LUNA2000-200KTL	
Maximum LV AC Inputs	34	
AC Power	6,800 kVA @40°C [1]	
Rated Input Voltage	800 V	
LV Main Switches	ACB (2900 A / 800 V / 3P, 2 x 1 pcs), MCCB (250 A / 800 V / 3P, 2 x 17 pcs)	
Output		
Rated Output Voltage	11 kV, 15 kV, 20 kV, 22 kV, 30 kV, 33 kV, 35 kV [2]	13.8 kV, 34.5 kV [2]
Frequency	50 Hz	60 Hz
Transformer Type	Oil-immersed, Conservator Type	
Transformer Cooling Type	ONAN	
Transformer Tappings	± 2 x 2.5%	
Transformer Oil Type	Mineral Oil (PCB Free)	
Transformer Vector Group	Dy11-y11	
Transformer Min. Peak Efficiency Index	Tier 1 or Tier 2 In Accordance with EN 50588-1	
RMU Type	SF_6 Gas Insulated	
RMU Transformer Protection Unit	MV Vacuum Circuit Breaker Unit	
RMU Cable Incoming / Outgoing Unit	Direct Cable Unit or Cable Load Break Switch Unit	
Auxiliary Transformer	Dry Type Transformer, 5 kVA, Dyn11	
Output Voltage of Auxiliary Transformer	400 / 230 Vac or 220 / 127 Vac	
Protection		
Transformer Monitoring & Protection	Oil Level, Oil Temperature, Oil Pressure and Buchholz	
Protection Degree of MV & LV Room	IP 54	
Internal Arcing Fault Classification of STS	IAC A 20 kA 1s	
MV Relay Protection	50/51, 50N/51N	
LV Overvoltage Protection	Type I+II	
Anti-rodent Protection	C5 Medium in accordance with ISO 12944	
Features		
2 kVA UPS	Optional [3]	
MV Surge Arrester for MV VCB	Optional [3]	
General		
Dimensions (W x H x D)	6,058 x 2,896 x 2,438 mm (20' HC Container)	
Weight	< 22 t	
Operating Temperature Range	-25°C ~ 60°C [4] (-13°F ~ 140°F)	
Relative Humidity	0% ~ 95%	
Max. Operating Altitude	1,000 m [5]	1,500 m [5]
MV-LV AC Connections	Prewired and Pretested, No Internal Cabling Onsite	
LV & MV Room Cooling	Smart Cooling without Air-across for Higher Availability	
Communication	Modbus-RTU, Preconfigured with Smartlogger3000B	
Applicable Standards	IEC 62271-202, EN 50588-1, IEC 60076, IEC 62271-200, IEC 61439-1	

1 - More detailed AC power of STS, please refer to the de-rating curve.
2 - Rated output voltage from 10 kV to 35 kV, more available upon request
3 - Extra expense needed for optional features which standard product doesn't contain, more options upon request.
4 -When ambient temperature ≥55°C, awning shall be equipped for STS on site by customer.
5- For higher operating altitude, pls consult with Huawei.

STS-3000K-H1

Smart Transformer Station



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Reliable

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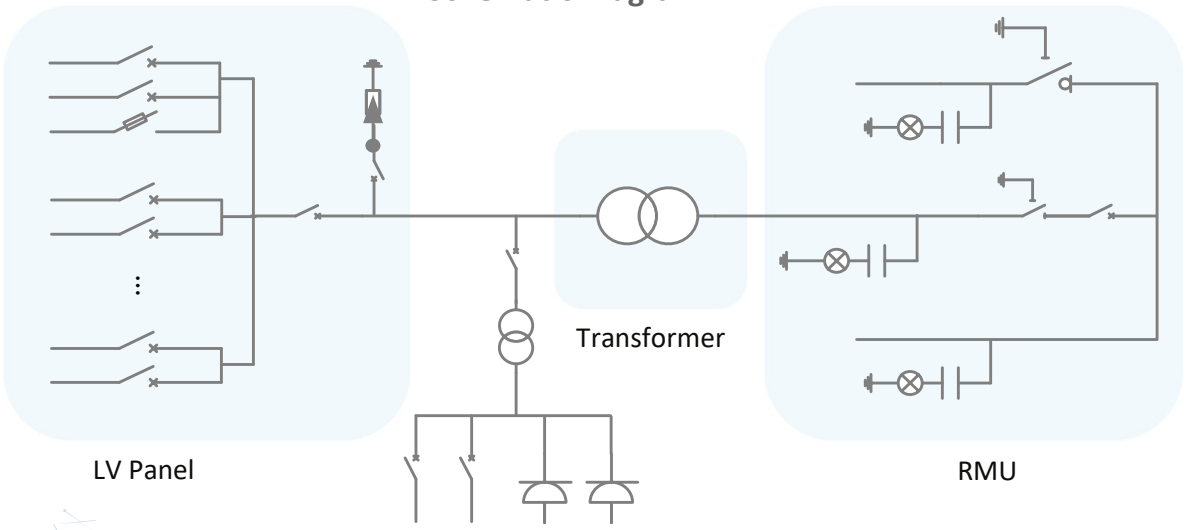
Optimal Cooling Design for High Availability and Easy O&M
Comprehensive Tests from Components, Device to Solution

Schematic Diagram



Technical Specifications

Input		
Available Inverters / PCS	SUN2000-200KTL / SUN2000-215KTL / SUN2000-185KTL / LUNA2000-200KTL	
Maximum LV AC Inputs	17	
AC Power	3,400 kVA @40°C [1]	
Rated Input Voltage	800 V	
LV Main Switches	ACB (2900 A / 800 V / 3P, 1 pcs), MCCB (250 A / 800 V / 3P, 17 pcs)	
Output		
Rated Output Voltage	11 kV, 15 kV, 20 kV, 22 kV, 30 kV, 33 kV, 35 kV [2]	13.8 kV, 34.5 kV [2]
Frequency	50 Hz	60 Hz
Transformer Type	Oil-immersed, Conservator Type	
Transformer Cooling Type	ONAN	
Transformer Tappings	± 2 x 2.5%	
Transformer Oil Type	Mineral Oil (PCB Free)	
Transformer Vector Group	Dy11	
Transformer Min. Peak Efficiency Index	Tier 1 or Tier 2 In Accordance with EN 50588-1	
RMU Type	SF_6 Gas Insulated	
RMU Transformer Protection Unit	MV Vacuum Circuit Breaker Unit	
RMU Cable Incoming / Outgoing Unit	Direct Cable Unit or Cable Load Break Switch Unit	
Auxiliary Transformer	Dry Type Transformer, 5 kVA, Dyn11	
Output Voltage of Auxiliary Transformer	400 / 230 Vac or 220 / 127 Vac	
Protection		
Transformer Monitoring & Protection	Oil Level, Oil Temperature, Oil Pressure and Buchholz	
Protection Degree of MV & LV Room	IP 54	
Internal Arcing Fault Classification of STS	IAC A 20 kA 1s	
MV Relay Protection	50/51, 50N/51N	
LV Overvoltage Protection	Type I+II	
Anti-rodent Protection	C5 Medium in accordance with ISO 12944	
Features		
2 kVA UPS	Optional [3]	
MV Surge Arrester for MV VCB	Optional [3]	
General		
Dimensions (W x H x D)	6,058 x 2,896 x 2,438 mm (20' HC Container)	
Weight	< 15 t	
Operating Temperature Range	-25°C ~ 60°C [4] (-13°F ~ 140°F)	
Relative Humidity	0% ~ 95%	
Max. Operating Altitude	1,000 m [5]	1,500 m [5]
MV-LV AC Connections	Prewired and Pretested, No Internal Cabling Onsite	
LV & MV Room Cooling	Smart Cooling without Air-across for Higher Availability	
Communication	Modbus-RTU, Preconfigured with Smartlogger3000B	
Applicable Standards	IEC 62271-202, EN 50588-1, IEC 60076, IEC 62271-200, IEC 61439-1	

1 - More detailed AC power of STS, please refer to the de-rating curve.
2 - Rated output voltage from 10 kV to 35 kV, more available upon request
3 - Extra expense needed for optional features which standard product doesn't contain, more options upon request.
4 -When ambient temperature ≥55°C, awning shall be equipped for STS on site by customer.
5- For higher operating altitude, pls consult with Huawei.

SmartACU2000D

Smart Array Controller

With SmartPID2000 Module

Without SmartPID2000 Module

Smart

Support one-click commissioning
Patented anti-PID module

Simple

SmartPID2000 & Smartlogger3000B
pre-installed with multiple interfaces

Reliable

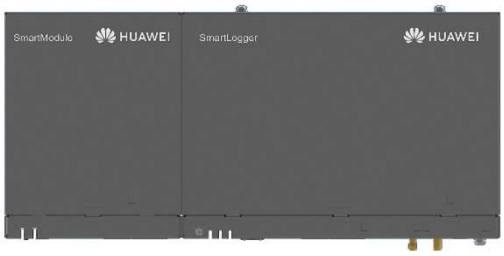
Industrial-level application
and high reliability

Technical Specifications	SmartACU2000D-D-06(Preliminary)	SmartACU2000D-D-00	SmartACU2000D-D-02	SmartACU2000D-D-01	SmartACU2000D-D-03
Configuration					
SmartLogger	SmartLogger3000B x 1				
SmartModule1000A	Optional				Standard with 1
Ethernet	14	1 or 3 (with a SmartModule1000A) or 6 (with a SmartModule1000A and a five-port switch)			
RS485	COM x 6, 1,200 / 2,400 / 4,800 / 9,600 / 19,200 / 115,200 bps				
Optical Ethernet	SFP x 10, 100 / 1,000 Mbps	SFP x 2, 100 / 1,000 Mbps			
Number of MBUS Module [1]	0	1	2	1	2
Number of SmartPID2000 Module	0	0	0	1	2
Environment					
Operating Temperature Range	-40°C ~ 60°C				
Relative Humidity	4% ~ 100%				
Max. Operating Altitude	4,000 m				
Electrical					
AC Input Voltage for Cabinet	100 V ~ 240 V, L / N (L)+ PE				
AC Input Voltage for MBUS	380 V ~ 800 V, 3Ph				
AC Input Voltage for PID	380 V ~ 800 V, 3Ph + FE (Functional Earth)				
AC Input Frequency	50 Hz / 60 Hz				
Power Supply	Standard: 12 V DC, Optional: 24 V DC[2]				
Mechanical					
Cable Entries	Bottom in & out				
Maintenance	Front				
Dimensions (W x H x D)	640 x 770 x 315 mm			880 x 770 x 369 mm	
Weight	32 kg	29 kg	32 kg	49 kg	61 kg
Protection Degree	IP65				
Installation Options	Wall Mounting, Rack Mounting, Pole Mounting				

1 - Compatible with communication mode of PLC (Power Line Communication).
2 - 24V DC power supply is optional to power devices that require 24Vdc input and output.

SmartLogger3000B

Without SmartModule1000A



With SmartModule1000A

Smart

Connecting up to 150 inverters,
One-click commissioning

Simple

Deployment wizard allowed, including parameters configuration, devices connection

Reliable

Safety improvement
by lightning protection module

Technical Specifications	SmartLogger3000B	SmartLogger3000B with SmartModule1000A
Device Management		
Max. Number of Manageable Devices	200	
Max. Number of Manageable Inverters	150	
Communication Interface		
WAN	WAN x 1, 10 / 100 / 1,000 Mbps	
LAN	LAN x 1, 10 / 100 / 1,000 Mbps	LAN x 3, 10 / 100 / 1,000 Mbps
Optical Ethernet	SFP x 2, 100 / 1,000 Mbps	
MBUS	MBUS x 1, 115.2 kbps, Compatible with PLC	
RS485	COM x 3, 1,200 / 2,400 / 4,800 / 9,600 / 19,200 / 115,200 bps	COM x 6, 1,200 / 2,400 / 4,800 / 9,600 / 19,200 / 115,200 bps
Digital / Analog Input / Output	DI x 4, DO x 2, AI x 4	DI x 8, DO x 2, AI x 7
PT100 / PT1000	0	2
Active DO	12 V, 100 mA (connection with relay, sensor)	
Communication Protocol		
Ethernet	Modbus-TCP, IEC 60870-5-104	
RS485	Modbus-RTU, IEC 60870-5-103 (standard), DL / T645	
Interaction		
LED	LED Indicator x 3 – RUN, ALM, 4G	LED Indicator x 5 – RUN, ALM, 4G (Smartlogger3000B) & RUN, ALM (SmarModule1000A)
WEB	Embedded Web	
USB	USB 2.0 x 1	
APP	Communication by WLAN for commissioning	
Environment		
Operating Temperature Range	-40°C ~ 60°C (-40°F ~ 140°F)	
Storage Temperature Range	-40°C ~ 70°C (-40°F ~ 158°F)	
Relative Humidity (Non-condensing)	5% ~ 95%	
Max. Operating Altitude	4,000 m (13,123 ft.)	
Electrical		
Power Adapter	AC input: 100 V ~ 240 V, 50 Hz / 60 Hz; DC output: 12 V, 2 A	
DC Power Supply	24 V, 0.8 A	
Power Consumption	Typical 9 W, Max. 15 W	Typical 10 W, Max. 18 W
Mechanical		
Dimensions (W x H x D, without mounting ears)	225 x 160 x 44 mm (8.9 x 6.3 x 1.7 inch)	350 x 160 x 44 mm (13.8 x 6.3 x 1.7 inch)
Weight	2 kg (4.4 lb.)	3 kg (6.6 lb.)
Protection Degree	IP20	
Installation Options	Wall Mounting, DIN Rail Mounting, Tabletop Mounting	

SmartPID2000 Module
Inside Smart Array Controller

The SmartPID2000 Module is installed in the SmartACU2000D cabinet to reduce the negative effect of the Potential Induced Degradation (PID), and support 1000 V / 1100 V / 1500 V DC system.

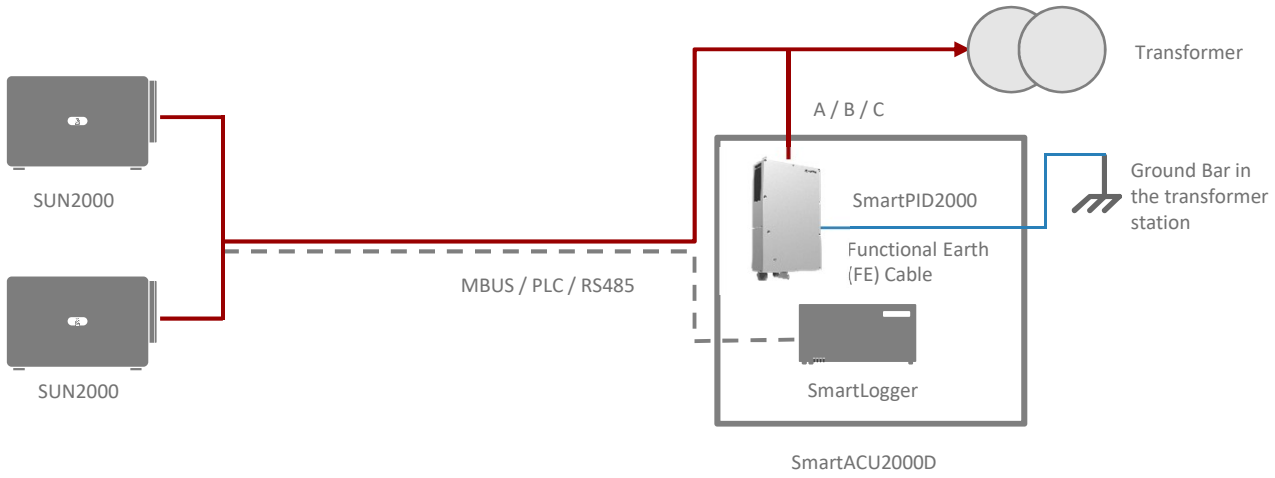
Smart

Data read and software upgrade through USB or the embedded Web

Reliable

Protection degree of IP65

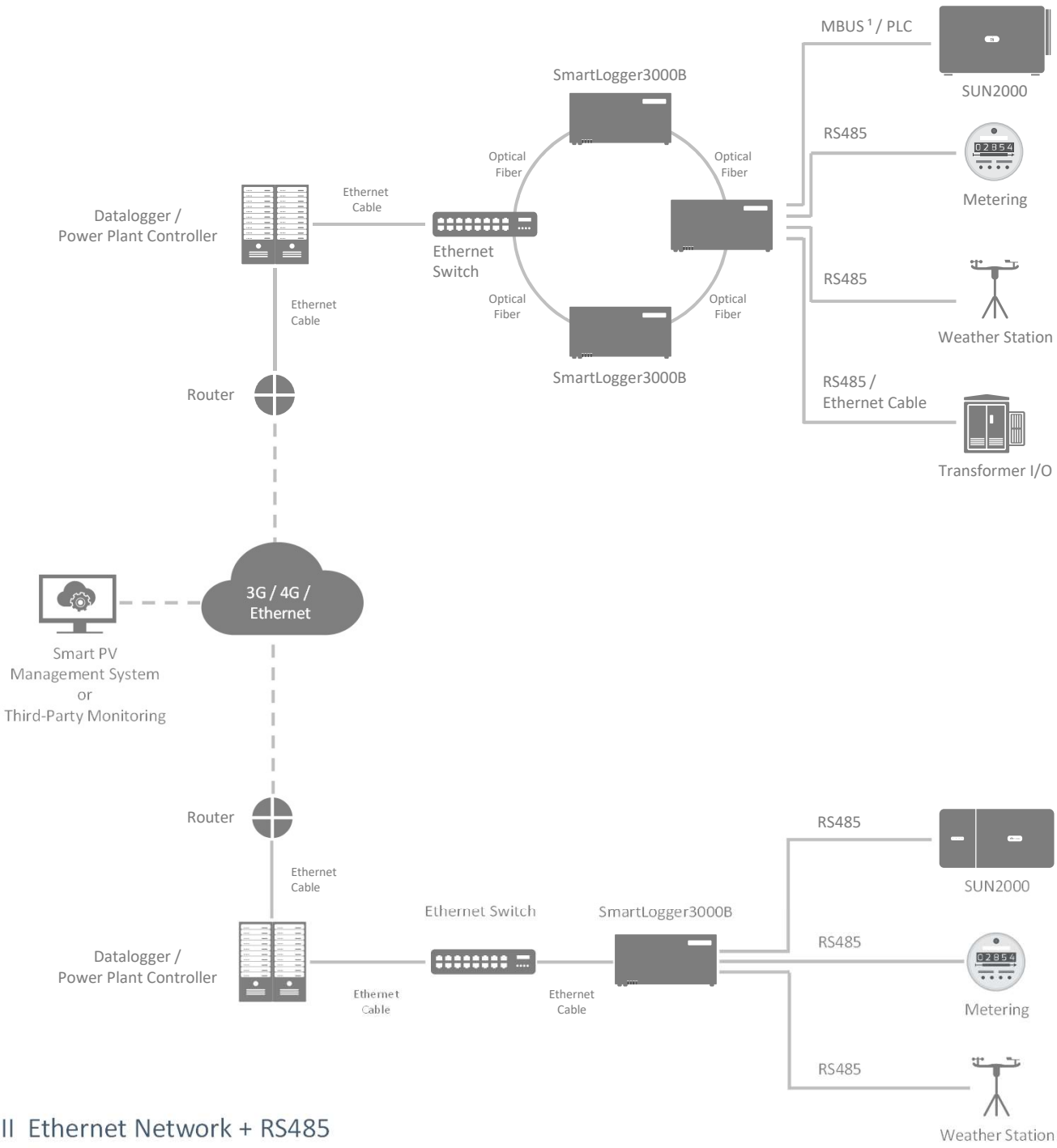
SmartPID2000 Solution Diagram



Note:
1 - The Anti-PID solution could ONLY be deployed in utility installations which are normally connected to the medium voltage (MV) grid running WITHOUT neutral line.
2 - The Anti-PID module must work with Huawei SmartLoggers and Huawei inverters.

Network Applications

I Optical Fiber Ring Network + MBUS / PLC



II Ethernet Network + RS485

1 - Compatible with communication mode of PLC (Power Line Communication).

Smart PVMS

Smart

Auto faults alarming and reports issuing
Smart I-V Curve Diagnosis supported

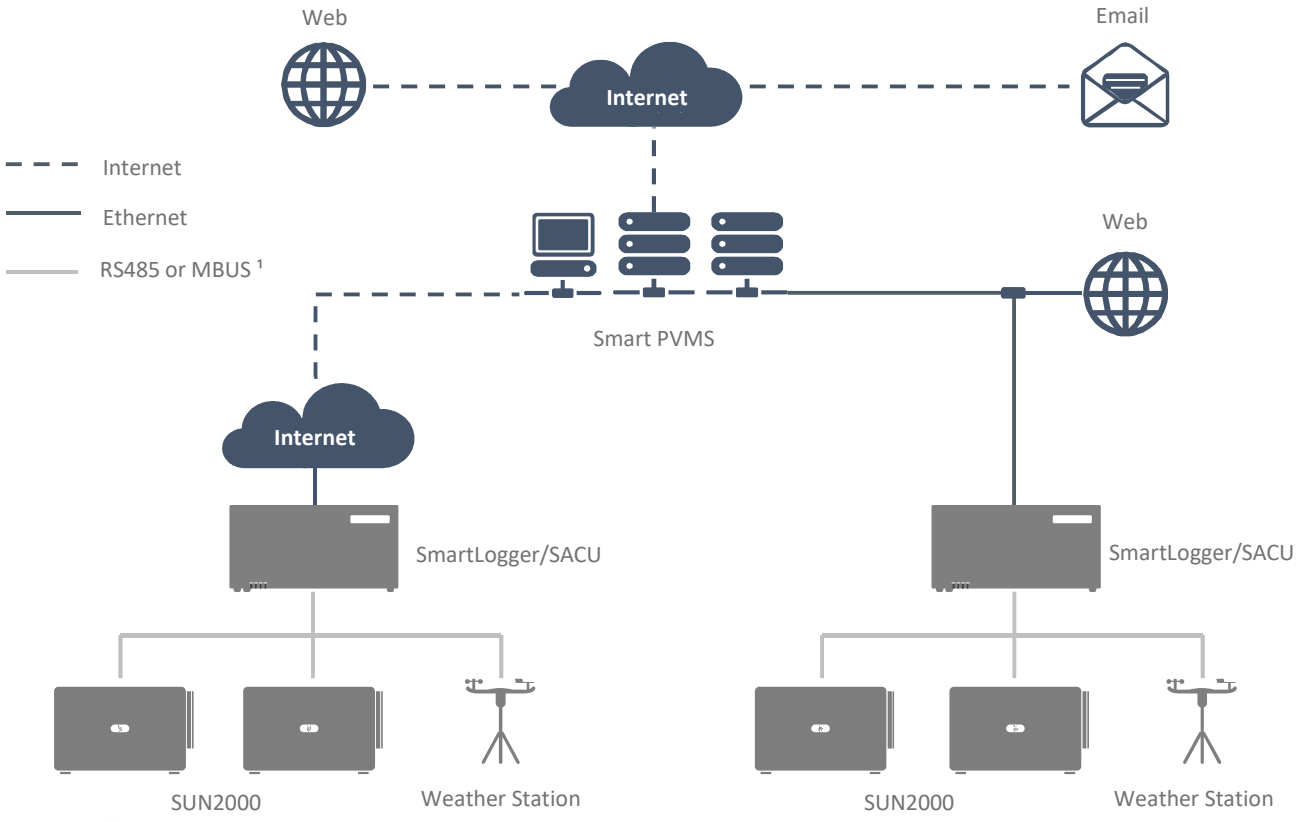
Simple

One-click installation on PC
Fault alarms via SMS and E-mail

Reliable

Hierarchical management
Up to 25 years data storage

Network Structure



1 - Compatible with communication mode of PLC (Power Line Communication).

Smart PVMS Server Standard Version

10000 devices supported

Software pre-installation, saving installation time

Leverages patented DEMT, better energy efficiency

Technical Specification	FusionServer Pro 2288X V5 H22X-05
Max. Devices Supported	10,000 equivalent devices
Form Factor	2U rack server
Processors	2 * Intel Xeon Silver 4208 (2.1 GHz / 8-Core / 11 MB)
Memory	2 * 32 GB DDR4 RDIMM, ECC
Internal Storage	2 * 1.2 TB, SAS 2.5“ HDD, 10,000 RPM
Operating System	Euler OS
Database	Gauss DB
RAID Support	RAID 1
Network Ports	Two PCIe NICs, each supporting four GE electrical ports
Power Supply Units	2 hot-swappable PSUs, 1+1 redundancy
Power Supply	Input: 100-240 V_{AC} / 11~5.5 A ; 240 V_{DC} / 5 A
Fan Modules	4 hot-swappable counter-rotating fan modules, N+1 redundancy
Operating Temperature	5℃ ~ 40℃
Dimensions (H x W x D)	86.1 x 447 x 748 mm
Weight	29 kg
Certification	CE, UL, FCC, CCC, RoHS

Smart PVMS Server Premium Version

30000 devices supported

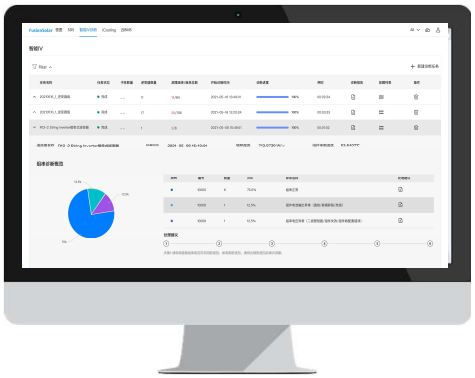
Software pre-installation, saving installation time

Leverages patented DEMT, better energy efficiency

Technical Specification	FusionServer Pro 2288X V5
Max. Devices Supported	30,000 equivalent devices
Form Factor	2U rack server
Processors	2 * Intel Xeon Gold 5218 (2.3 GHz / 16-Core / 22 MB)
Memory	4 * 32 GB DDR4 RDIMM, ECC
Internal Storage	2 * 1.2 TB + 8 * 1.8 TB, SAS 2.5” HDD, 10,000 RPM
Operating System	Euler OS
Database	Gauss DB
RAID Support	RAID 1, RAID 10
Network Ports	Two PCIe NICs, each supporting four GE electrical ports
Power Supply Units	2 hot-swappable PSUs, 1+1 redundancy
Power Supply	Input: 100-240 V_{AC} / 11~5.5 A ; 240 V_{DC} / 5 A
Fan Modules	4 hot-swappable counter-rotating fan modules, N+1 redundancy
Operating Temperature	5℃ ~ 40℃
Dimensions (H x W x D)	86.1 x 447 x 748 mm
Weight	30 kg
Certification	CE, UL, FCC, CCC, RoHS

Smart I-V Curve Diagnosis

Smart I-V Curve Diagnosis is able to carry out online I-V curve analysis on entire strings with advanced diagnosis algorithm. The scanning would help to find out and identify the strings with low performance or malfunction, which would help to achieve proactive maintenance, higher O&M efficiency and lower operation cost.



Smart

Support plant-level, array-level and inverter-level analysis and diagnosis

Support scheduled scanning and proactive presentation of reports

Automatically identify different failure types and provide recovery suggestion

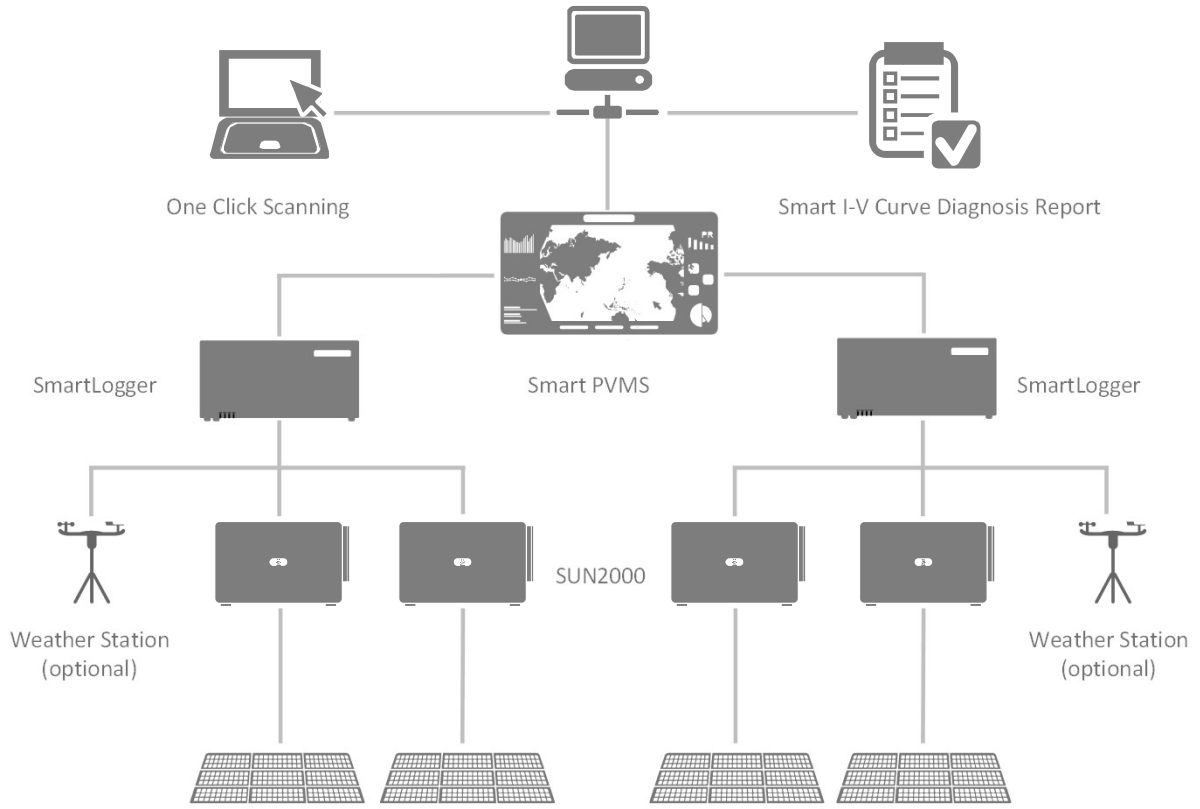
Support export of ROI estimation reports and assist in accurate O&M

Efficient

One-click scanning without onsite experts or equipment

Completing online I-V curve scanning on all strings of 100 MW plant within 20 minutes

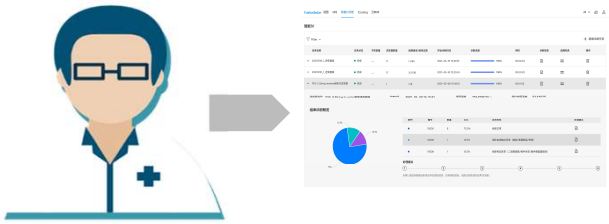
Network Structure



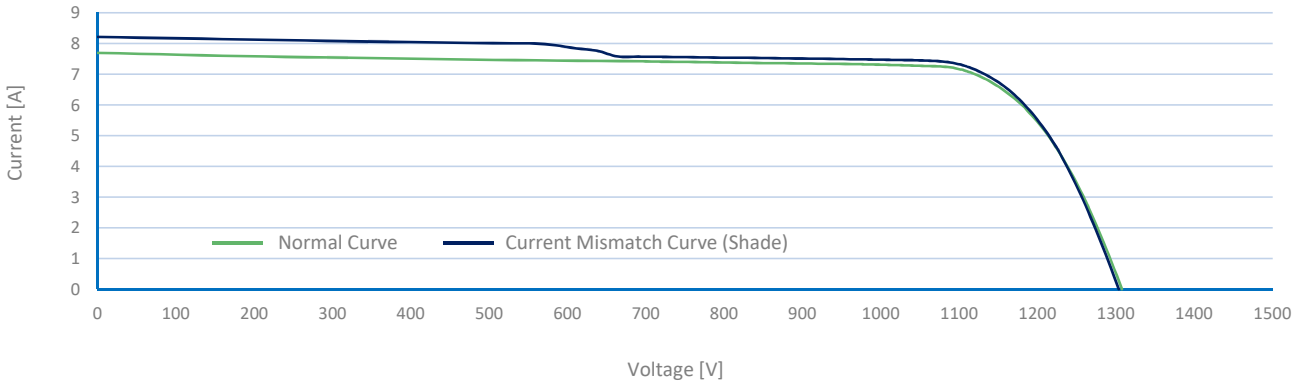
Smart I-V Curve Diagnosis

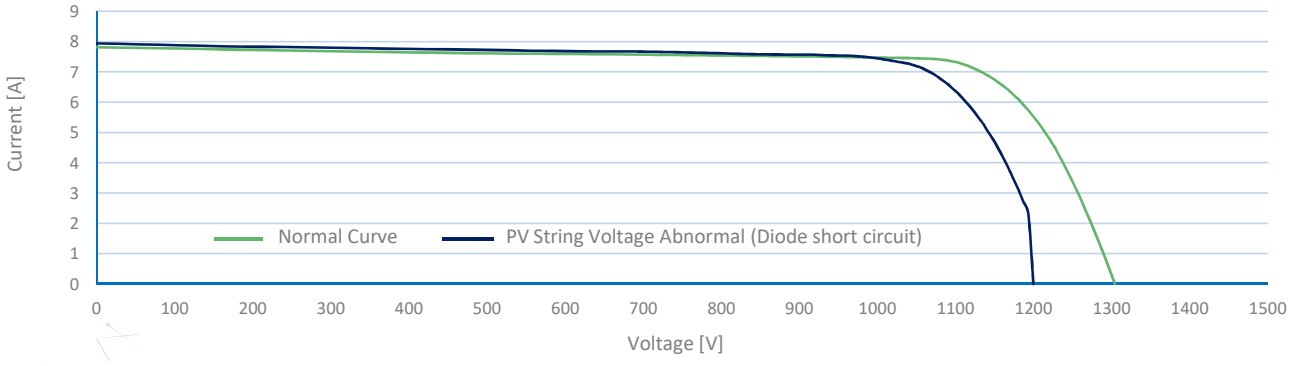
Technical Specifications	
Smart String Inverter	SUN2000-215KTL-H0, SUN2000-215KTL-H3, SUN2000-185KTL-H1 ...
Data Logger	SmartLogger2000, SmartLogger3000
Management System	Smart PVMS
Scanning Time	< 1s per string
Sampling Points per I-V Curve	128
Voltage Accuracy	0.5%rdg. + 1dgt. (rdg.>5, dgt.= 0.3)
Current Accuracy	0.5%rdg. + 2dgt. (rdg.>0.3, dgt.= 0.006)

Smart I-V Curve Diagnosis Verified by TUV

String-level Management	Smart I-V Curve Diagnosis
	
Real time monitoring	Fault Analysis

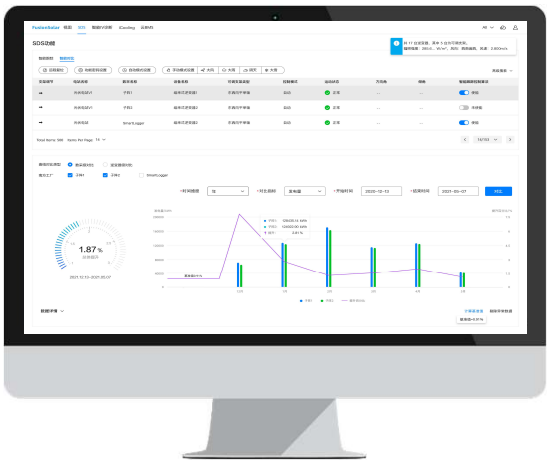
String I-V Curve Comparison





Smart Tracker Control Algorithm (SDS)

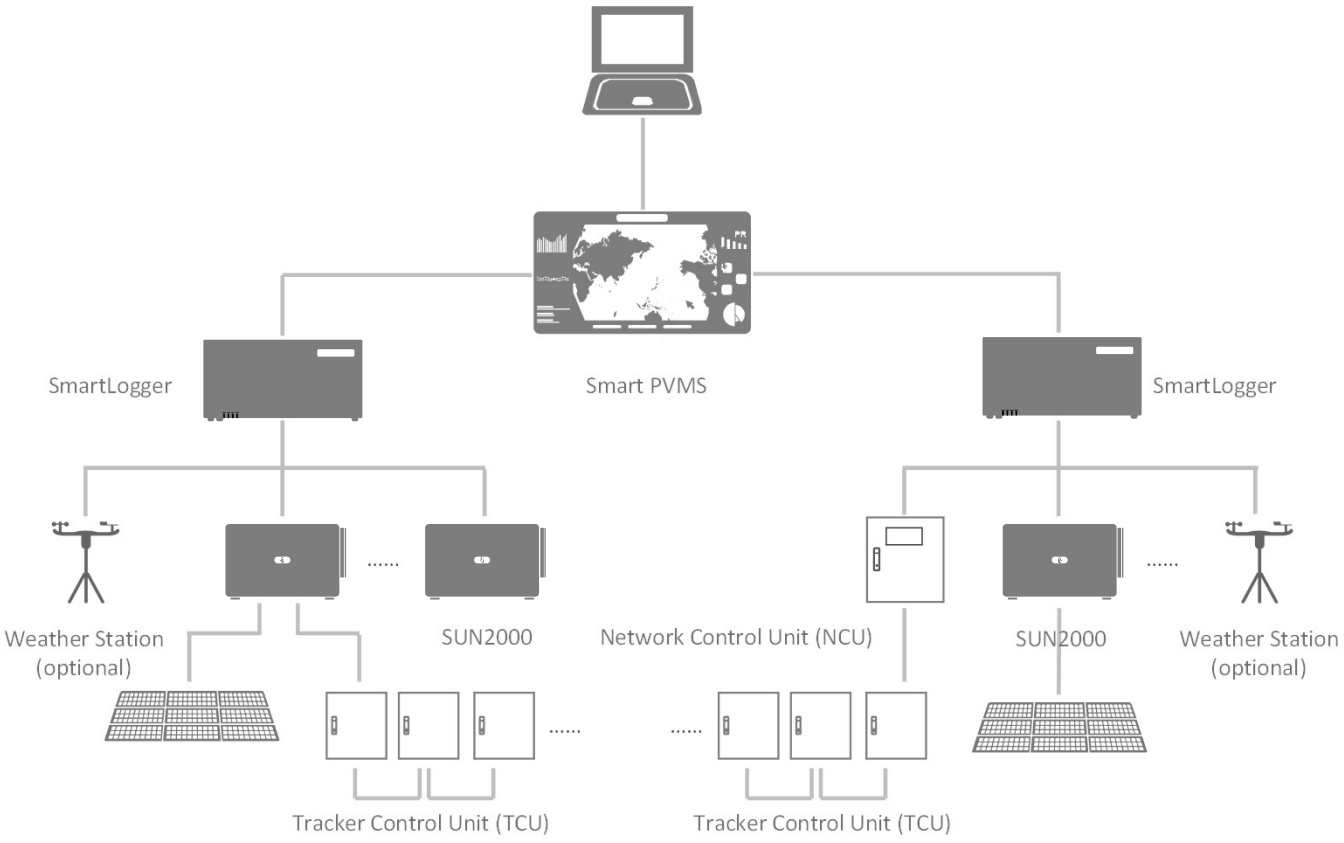
Smart Tracker Control Algorithm (SDS) is a valuable software of AI technology based and closed-loop control. By using the SDS, together with Smart PVMS, SmartLogger and SUN2000 inverters, the trackers' angle can be automatically controlled and optimally adjusted to achieve higher yields. The yields can be increased by ~1% especially in complex terrain and weather scenarios, and it will bring higher revenue to the customer.



- System level closed-loop control to keep the system operating in the state of maximum irradiation and optimal power output of PV module

- Automatic tracking angle optimization and control by using AI technology, automatic sensing of shading and weather information. No need for additional sensing equipment, free from manual and empirical dependence

Network Structure

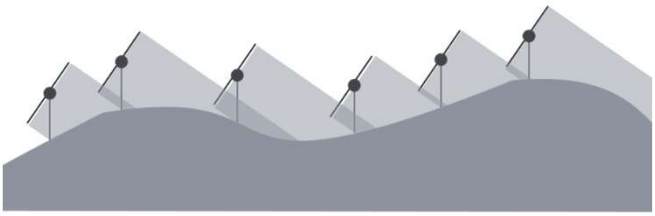
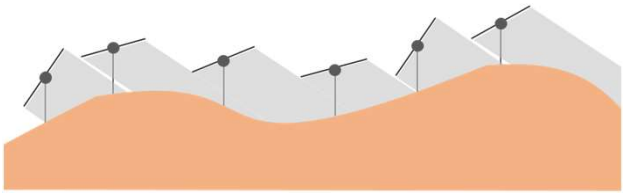


Smart Tracker Control Algorithm (SDS)

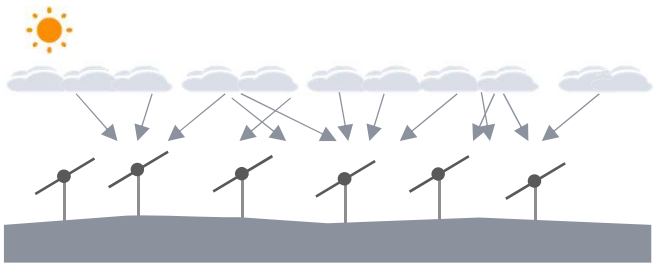
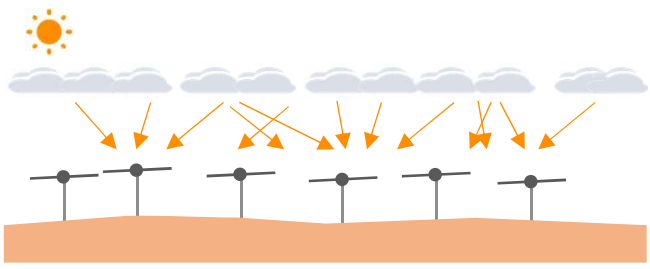
Technical Specifications	
Smart String Inverter	SUN2000-215KTL-H0, SUN2000-215KTL-H3, SUN2000-185KTL-H1 ...
Data Logger	SmartLogger2000, SmartLogger3000 series
Management System	Smart PVMS
Tracking Angle Accuracy	0.5°
Smart Tracker Control Algorithm Verified by TUV	

Comparison of Tracker Algorithms and Angles

Reverse-tracking stage in the morning and at dusk

Shadows in the front and back rows of modules, without consideration of complex terrain	The SDS algorithm allows trackers to find the optimal angle for each, effectively avoiding shadow occlusions.
	
Traditional tracker algorithm	**Smart Tracker Control Algorithm**

Cloudy and rainy days

Tracking the angle of the sun is not the best way to get maximum irradiation when without consideration that direct sunlight becomes diffuse reflection in this scenario.	Trackers are flattened at a small angle to receive more diffuse light, so as to get maximum irradiation.
	
Traditional tracker algorithm	**Smart Tracker Control Algorithm**

HUAWEI TECHNOLOGIES CO., LTD.

Huawei Industrial Base, Bantian Longgang
Shenzhen 518129, P.R. China
Tel: 400-822-9999
Solar.Huawei.com

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