



FUSIONSOLAR
Utility Smart PV Solution

SOLAR.HUAWEI.COM





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 committed 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.

Our 2018 sales revenue was US\$108.5 billion, YoY growth of 21%.

Employees
180,000 +

R&D Personnel
80,000 +

Countries
170 +

Interbrand's Top 100
Best Global Brands
68

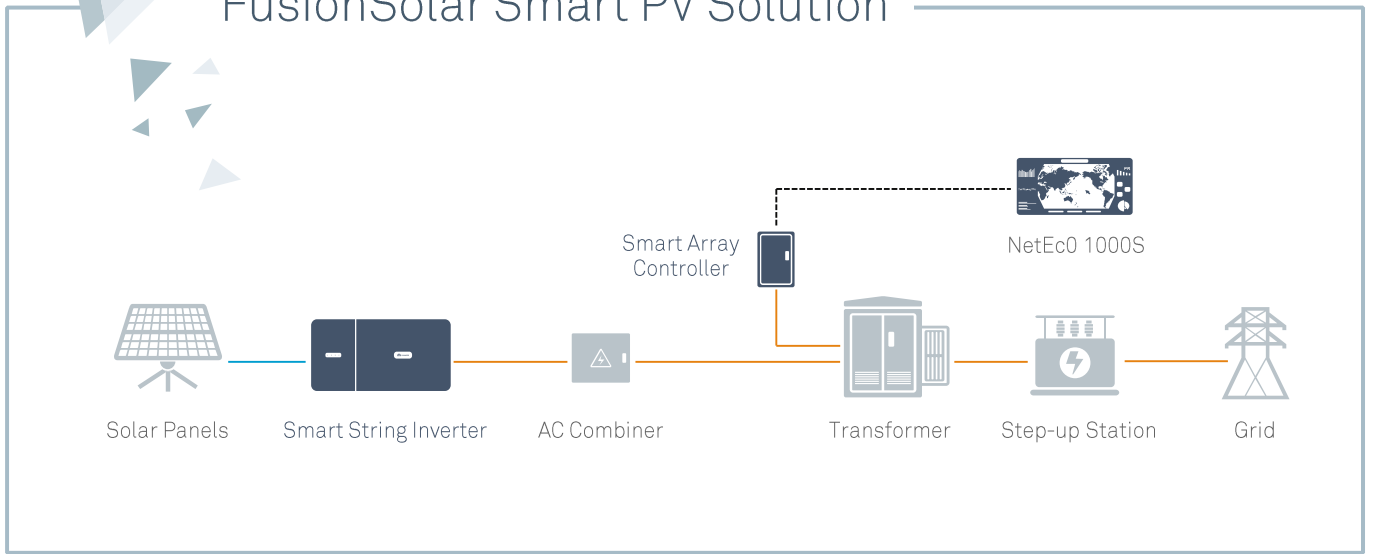
Fortune Global 500
72

Research institutes
/labs/centers
14

1
No.1
In global shipment 2015-2017

90GW+
Accumulated global shipment as of Dec. 2018

FusionSolar Smart PV Solution



Higher Yields
>2% Higher

Smart O&M
Lower OPEX

Safe & Reliable
25-year's Reliability



SUN2000-105KTL-H1

Smart String Inverter



6
MPP Trackers

Max. Efficiency
99.0%

String-level
Management

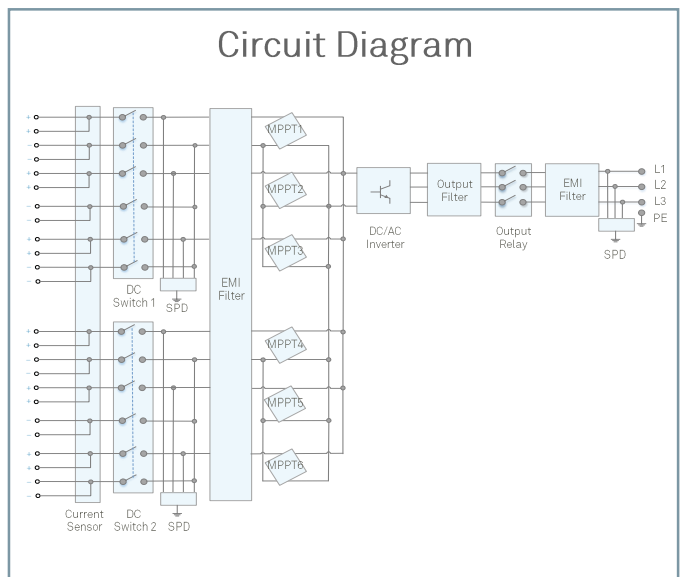
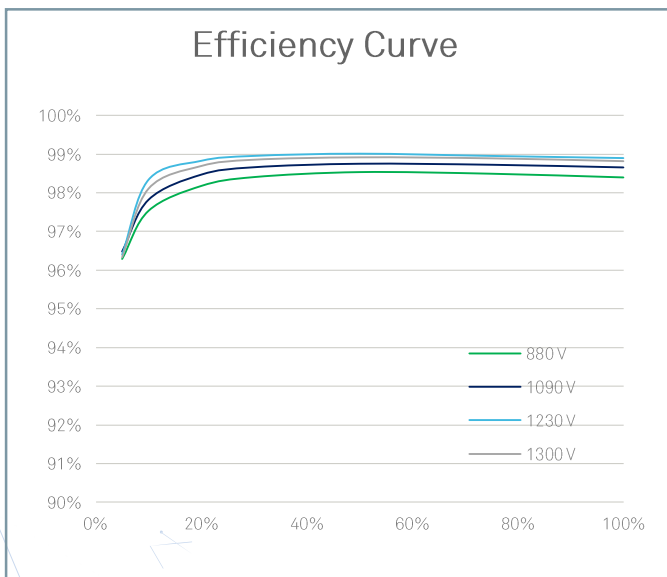
Smart I-V Curve
Diagnosis Supported

PLC
Supported

Fuse Free
Design

Surge Arresters for
DC & AC

IP65
Protection



Technical Specifications

Efficiency	
Max. Efficiency	99.0%
European Efficiency	98.8%
Input	
Max. Input Voltage	1,500 V
Max. Current per MPPT	25 A
Max. Short Circuit Current per MPPT	33 A
Start Voltage	650 V
MPPT Operating Voltage Range	600 V ~ 1,500 V
Rated Input Voltage	1,080 V
Number of Inputs	12
Number of MPP Trackers	6
Output	
Rated AC Active Power	105,000 W @40°C
Max. AC Apparent Power	116,000 VA @25°C
Max. AC Active Power (cos ϕ = 1)	116,000 W @25°C
Rated Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	75.8 A
Max. Output Current	84.6 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 + APP
USB	Yes
RS485	Yes
Power Line Communication (PLC)	Yes
General	
Dimensions (W x H x D)	1,075 x 605 x 310 mm (42.3 x 23.8 x 12.2 inch)
Weight (with mounting plate)	79 kg (174.2 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol UTX
AC Connector	Waterproof PG Connector + OT/DT Terminal
Protection Degree	IP65
Topology	Transformerless
Standard Compliance (more available upon request)	
Certificate	EN 62109-1/-2, IEC 62109-1/-2, IEC 62116, EN 50530, IEC 60068, IEC 61683
Grid Code	IEC 61727, ABNT NBR 16149, ABNT NBR 16150, ABNT NBR IEC 62116, RD 1699, RD 661, RD 413, RD 1565, UNE 206007-1 IN, UNE 206006 IN, P.O. 12.3, UTE C15-712-1

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SUN2000-60KTL-M0

Smart String Inverter



6
MPP Trackers



Max. Efficiency
98.9% (@480V)



String-level
Management



Smart I-V Curve
Diagnosis Supported



PLC
Supported



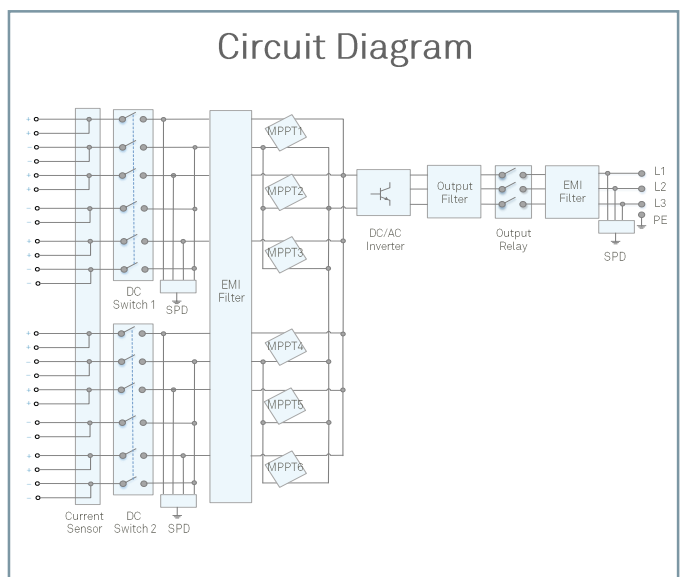
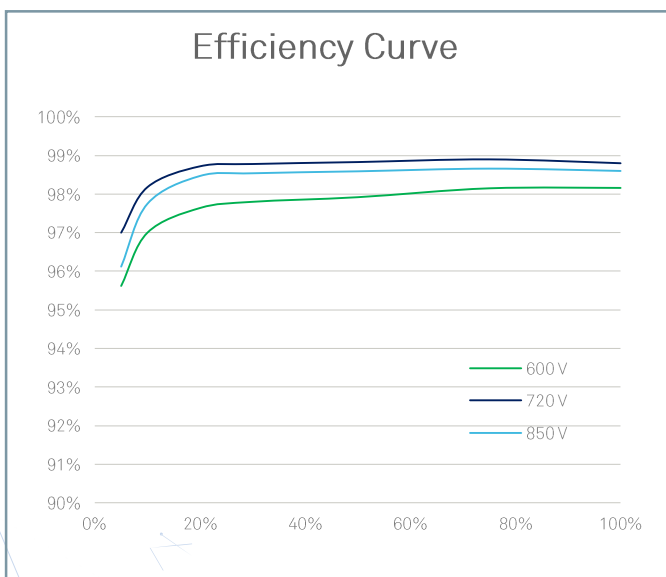
Fuse Free
Design



Surge Arresters for
DC & AC



IP65
Protection



Technical Specifications

Efficiency	
Max. Efficiency	98.9% @480 V, 98.7% @380 V/400 V
European Efficiency	98.7% @480 V, 98.5% @380 V/400 V
Input	
Max. Input Voltage	1,100 V
Max. Current per MPPT	22 A
Max. Short Circuit Current per MPPT	30 A
Start Voltage	200 V
MPPT Operating Voltage Range	200 V ~ 1,000 V
Rated Input Voltage	720 V @480 V, 600 V @380 V/400 V
Number of Inputs	12
Number of MPP Trackers	6
Output	
Rated AC Active Power	60,000 W
Max. AC Apparent Power	66,000 VA
Max. AC Active Power ($\cos\phi=1$)	66,000 W
Rated Output Voltage	480 V/400 V/380 V, 3W + (N) + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	72.2 A @480 V, 86.7 A @400 V, 91.2 A @380 V
Max. Output Current	79.4 A@480 V, 95.3 A @400 V, 100 A @380 V
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 + APP
USB	Yes
RS485	Yes
Power Line Communication (PLC)	Yes
General	
Dimensions (W x H x D)	1,075 x 555 x 300 mm (42.3 x 21.9 x 11.8 inch)
Weight (with mounting plate)	74 kg (163.1 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol Helios H4
AC Connector	Waterproof PG Connector + OT Terminal
Protection Degree	IP65
Topology	Transformerless
Standard Compliance (more available upon request)	
Certificate	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683
Grid Code	IEC 61727, G59/3, ABNT NBR 16149, ABNT NBR 16150, ABNT NBR IEC 62116, AS/NZS 4777.2

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SUN2000-50KTL-M0

Smart String Inverter



6
MPP Trackers



Max. Efficiency
98.7%



String-level
Management



Smart I-V Curve
Diagnosis Supported



PLC
Supported



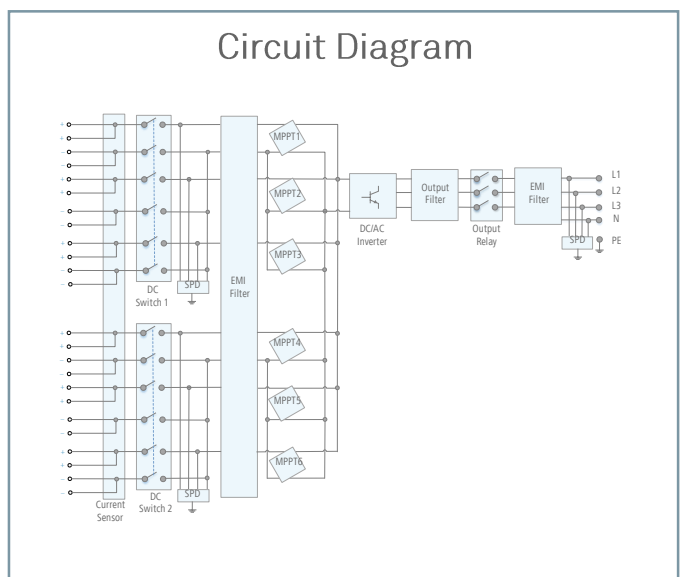
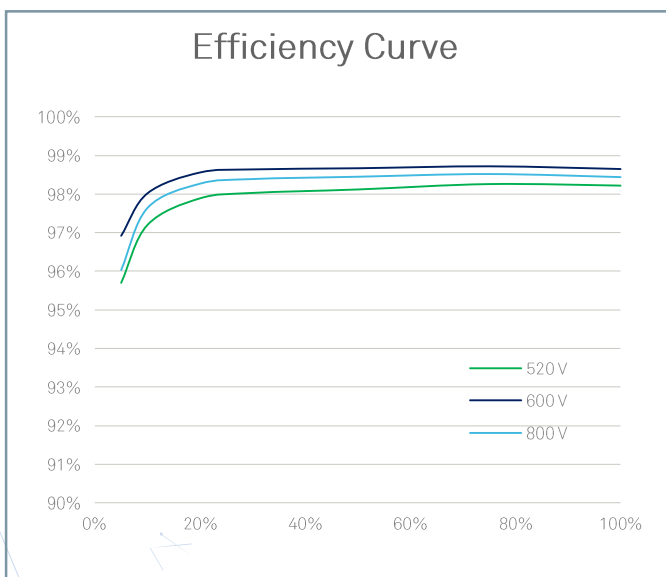
Fuse Free
Design



Surge Arresters for
DC & AC



IP65
Protection



Technical Specifications

Efficiency	
Max. Efficiency	98.7%
European Efficiency	98.5%
Input	
Max. Input Voltage	1,100 V
Max. Current per MPPT	22 A
Max. Short Circuit Current per MPPT	30 A
Start Voltage	200 V
MPPT Operating Voltage Range	200 V ~ 1,000 V
Rated Input Voltage	600 V
Number of Inputs	12
Number of MPP Trackers	6
Output	
Rated AC Active Power	50,000 W
Max. AC Apparent Power	55,000 VA
Max. AC Active Power ($\cos\phi=1$)	55,000 W
Rated Output Voltage	220 V / 380 V, 230 V / 400 V, default 3W + N + PE; 3W + PE optional in settings
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	76 A @380 V, 72.2 A @400 V
Max. Output Current	83.6 A @380 V, 79.4 A @400 V
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 + APP
USB	Yes
RS485	Yes
Power Line Communication (PLC)	Yes
General	
Dimensions (W x H x D)	1,075 x 555 x 300 mm (42.3 x 21.9 x 11.8 inch)
Weight (with mounting plate)	74 kg (163.1 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol Helios H4
AC Connector	Waterproof PG Connector + OT Terminal
Protection Degree	IP65
Topology	Transformerless
Standard Compliance (more available upon request)	
Certificate	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683
Grid Code	IEC 61727, G59/3, AS/NZS 4777.2, DEWA

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SmartLogger1000A



Smart

Smart zero export control design



Simple

2G / 3G / 4G communication¹



Reliable

Safety improvement by SPD inside

Technical Specifications	SmartLogger1000A
Device Management	
Max. Number of Manageable Devices	80
Communication Interface	
Electrical Ethernet	ETH x 1, 10 / 100 Mbps
RS485	COM x 3, 2400 / 4800 / 9600 / 19200 / 115200 bps, 1000 m
2G / 3G / 4G	LTE (FDD), DC-HSPA+ / HSPA+ / HSPA / UMTS, GSM / GPRS / EDGE ²
Digital / Analog Input / Output	DI x 4, DO x 2, AI x 4
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 4 – RUN, ALM, 4G, WLAN
WEB	Embedded Web
USB	USB 2.0 x 1
APP	Communication by WLAN
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	
AC Power Supply	100 V ~ 240 V, 50 Hz / 60 Hz
DC Power Supply	20 V ~ 30 V
Power Consumption	Typical 8 W, Max. 15 W
Mechanical	
Dimensions (W x H x D)	200 x 140 x 53 mm (7.9 x 5.5 x 2.1 inch) without mounting ears and antenna
Weight	2 kg (4.4 lb.)
Protection Degree	IP20
Installation Options	Wall Mounting, DIN Rail Mounting, Tabletop Mounting

¹ - When putting inside metal box, extended antenna will be needed.

² - For recommended carriers list and details on supported frequencies, please contact local distributors.

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Smart

Fast & reliable active and reactive power compensation control



Simple

Connecting up to 150 inverters



Reliable

Industrial-level application and high reliability

Technical Specifications	SmartLogger2000
Device Management	
Max. Number of Manageable Devices	200
Max. Number of Manageable Inverters	150
Communication Interface	
Electrical Ethernet	ETH x 2, 10 / 100 Mbps
Optical Ethernet (optional)	SFP x 2, 100 Mbps
RS485	COM x 6, 2400 / 4800 / 9600 / 19200 / 115200 bps
PLC	PLC x 1, 115.2 kbps
Digital / Analog Input / Output	DI x 8, DO x 3, AI x 7, AO x 4, PT100 / PT1000 x 2
Communication Protocol	
Ethernet	Modbus-TCP, IEC 60870-5-104
RS485	Modbus-RTU, IEC 60870-5-103 (standard), DL / T645
Interaction	
LED	LED Indicator x 4
WEB	Embedded WEB
Bluetooth	SUN2000 App
USB	USB 2.0 x 1
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 Supply	100 V ~ 240 V, 50 Hz / 60 Hz
Power Consumption	Typical 8 W, Max. 15 W
Mechanical	
Dimensions (W x H x D)	411 x 170 x 58.6 mm (16.2 x 6.7 x 2.3 inch)
Weight	2.5 kg (5.5 lb.)
Protection Degree	IP20
Export Limitation	Supported
Installation Options	Wall Mounting, DIN Rail Mounting, Integrated Inside SmartACU2000B

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SmartACU2000B

Smart Array Controller



With SmartPID2000 Module



Without SmartPID2000 Module



Smart

Multiple communication interfaces including RS485, Fast Ethernet, and SFP ports, flexible applications



Simple

Easy installation with SmartLogger2000 & SmartPID2000 module pre-assembled inside the cabinet



Reliable

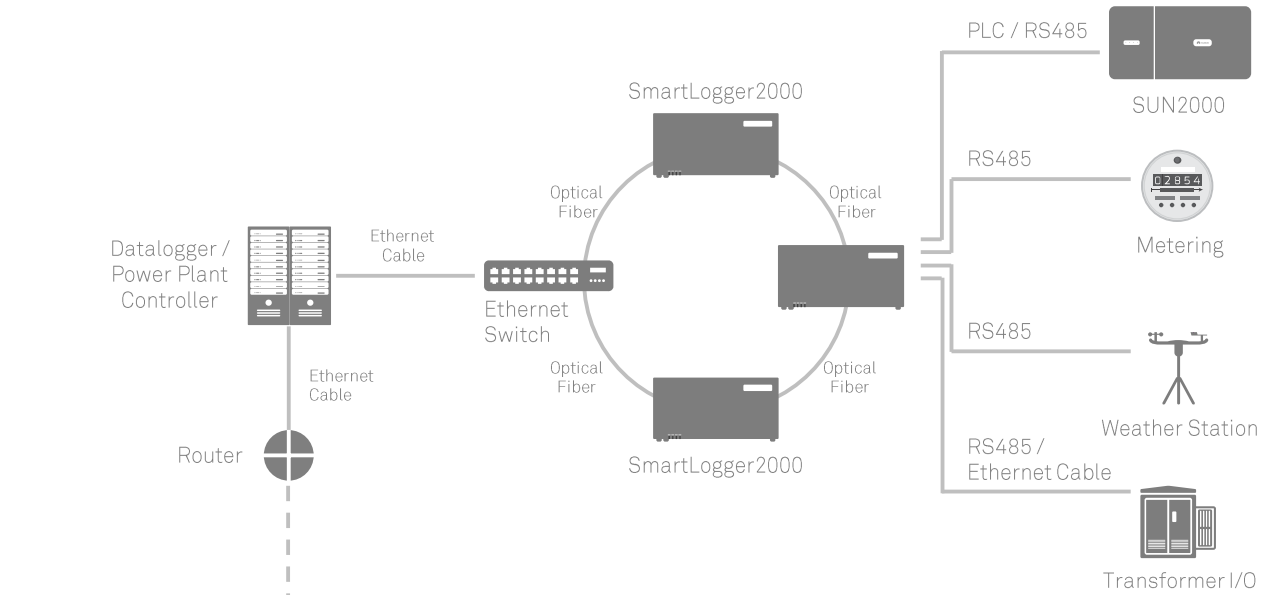
Industrial-level application and high reliability

Technical Specifications	SmartACU2000B-D-PLC	SmartACU2000B-D-2PLC	SmartACU2000B-D-PID/PLC	SmartACU2000B-D-2PID/2PLC
Configuration				
SmartLogger	SmartLogger2000			
RS485	Yes			
Number of PLC Module	1	2	1	2
Number of SmartPID2000 Module	0	0	1	2
Environment				
Operating Temperature Range	-40°C ~ 60°C (-40°F ~ 140°F)			
Relative Humidity	4% ~ 100%			
Max. Operating Altitude	4,000 m (13,123 ft.)			
Electrical				
Input AC Voltage for Cabinet	100 V ~ 240 V, L / N (L)+ PE			
Input AC Voltage for PLC	380 V ~ 800 V, 3Ph			
Input AC Voltage for PID	380 V ~ 800 V, 3Ph + FE (Functional Earth)			
Input AC Frequency	50 / 60 Hz			
Mechanical				
Cable Entries	Bottom in & out			
Maintenance	Front			
Dimensions (W x H x D)	640 x 770 x 315 mm (25.2 x 30.3 x 12.4 inch)		880 x 770 x 369 mm (34.6 x 30.3 x 14.5 inch)	
Weight	29 kg (63.9 lb.)	32 kg (70.5 lb.)	49 kg (108.0 lb.)	61 kg (134.5 lb.)
Protection Degree	IP65			
Installation Options	Wall Mounting, Rack Mounting, Pole Mounting			

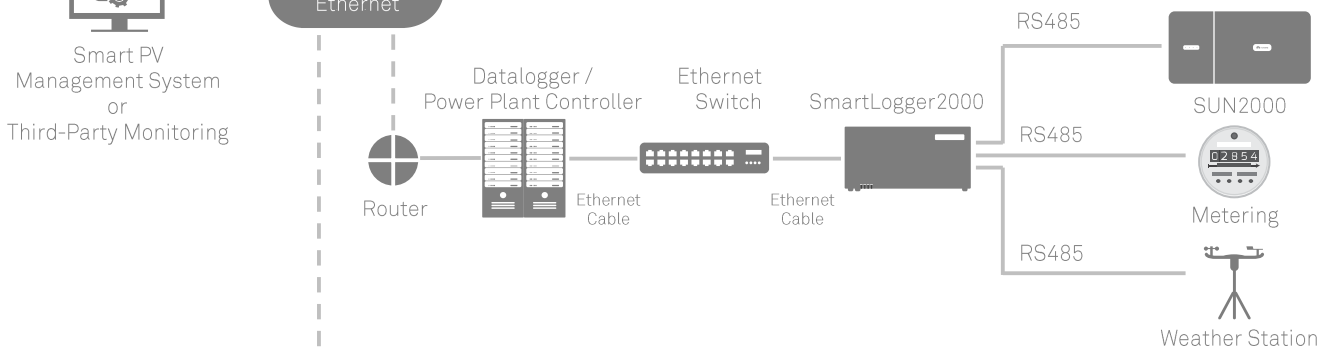
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Network Applications

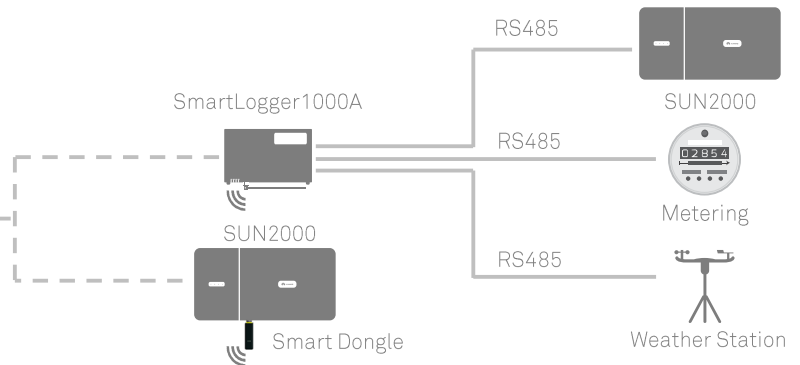
I Optical Fiber Ring Network + PLC



II Ethernet Network + RS485



III Wireless Network



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Smart

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



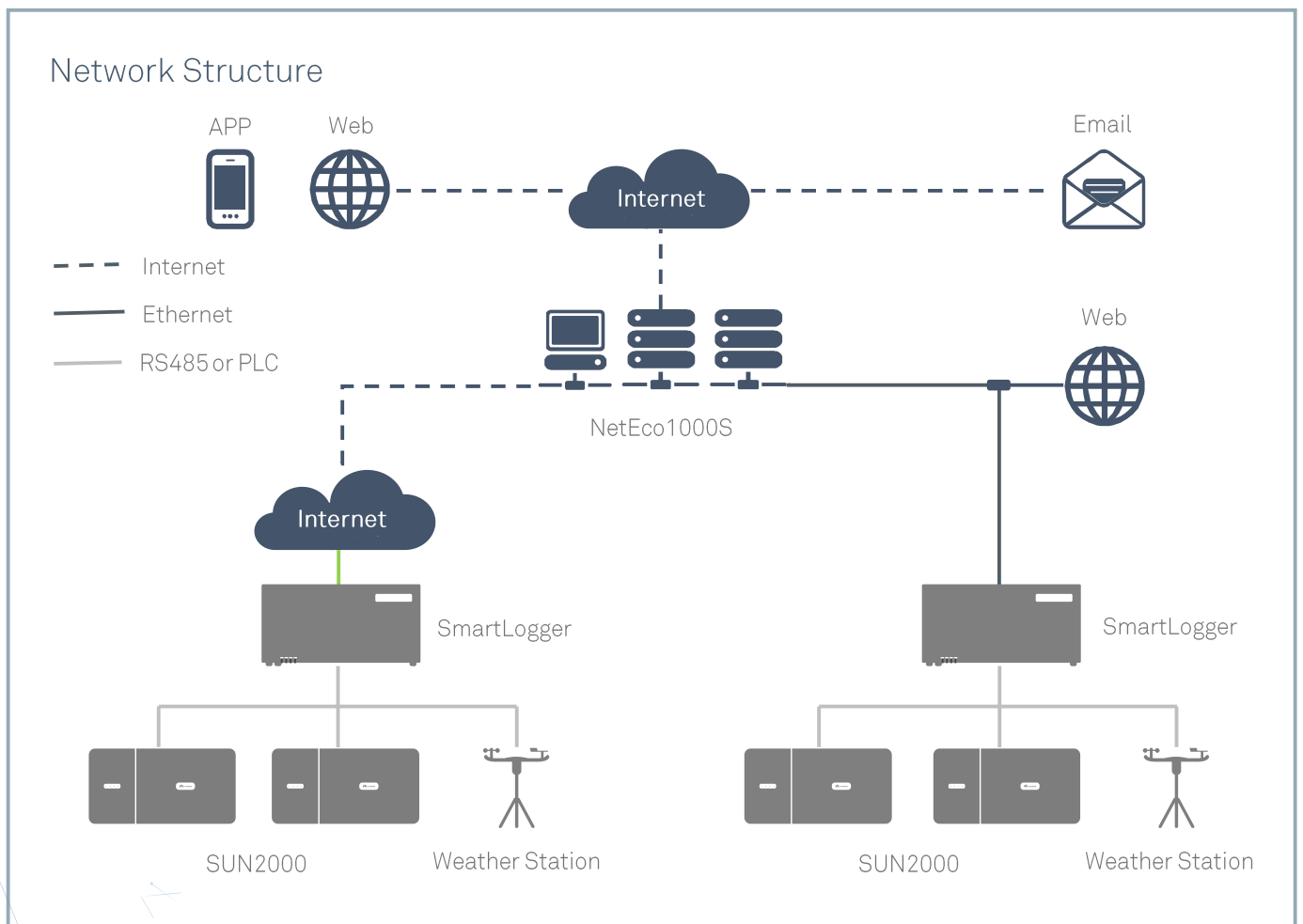
Simple

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



Reliable

Hierarchical management
Up to 25 years data storage

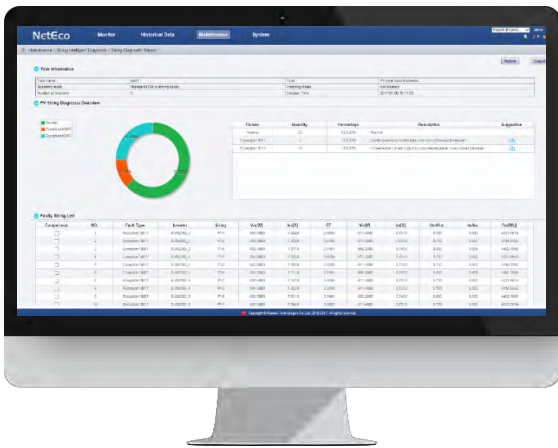


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Smart I-V Curve Diagnosis



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

Automatically identify different failure types and provide recovery suggestion



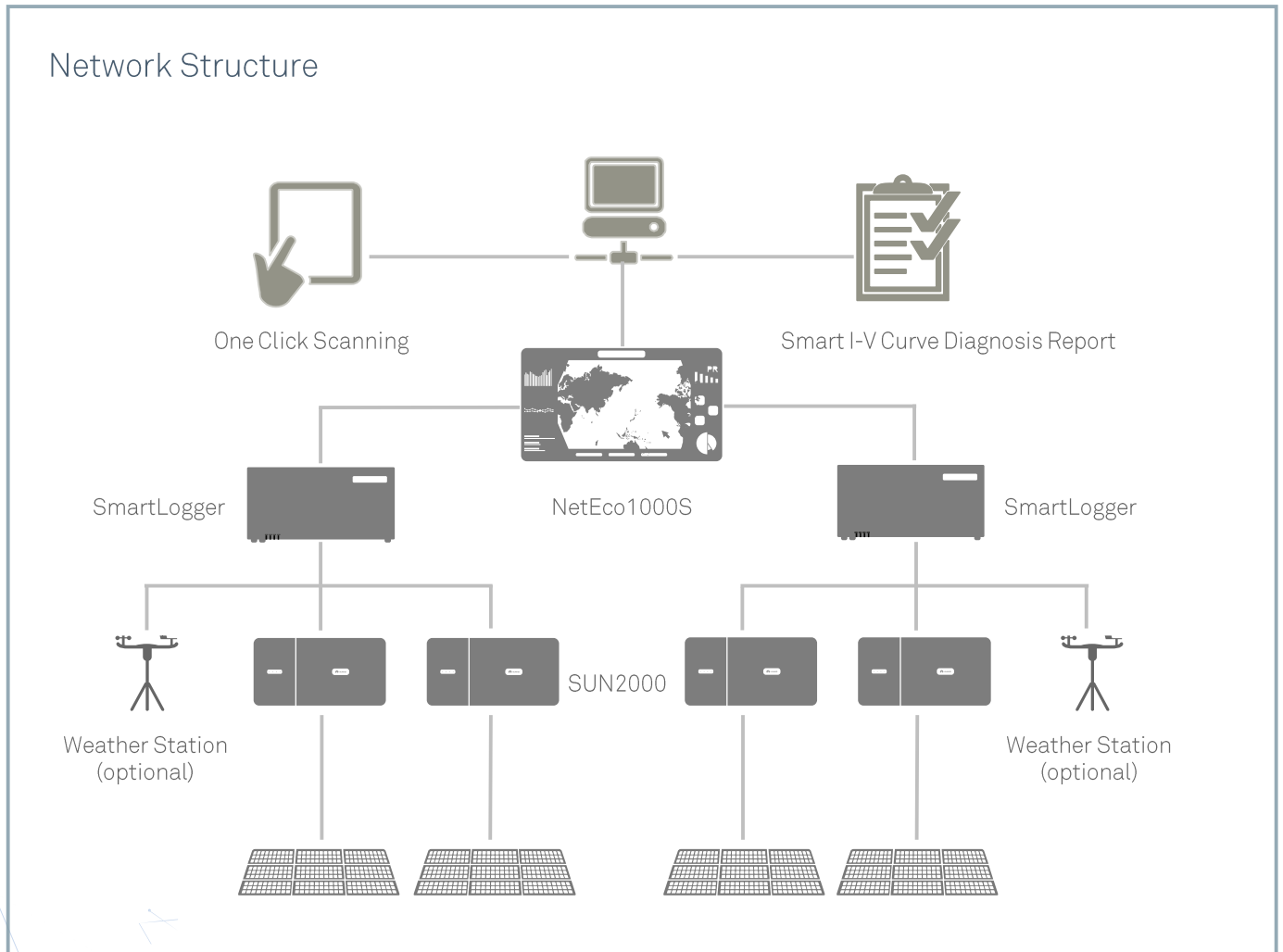
Efficient

One-click scanning without onsite experts or equipment

Completing online I-V curve scanning on all strings of 5 MW plant within 5 minutes

Automatic report generation of 5 MW plant I-V diagnosis within 15 minutes

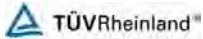
Network Structure



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Smart I-V Curve Diagnosis

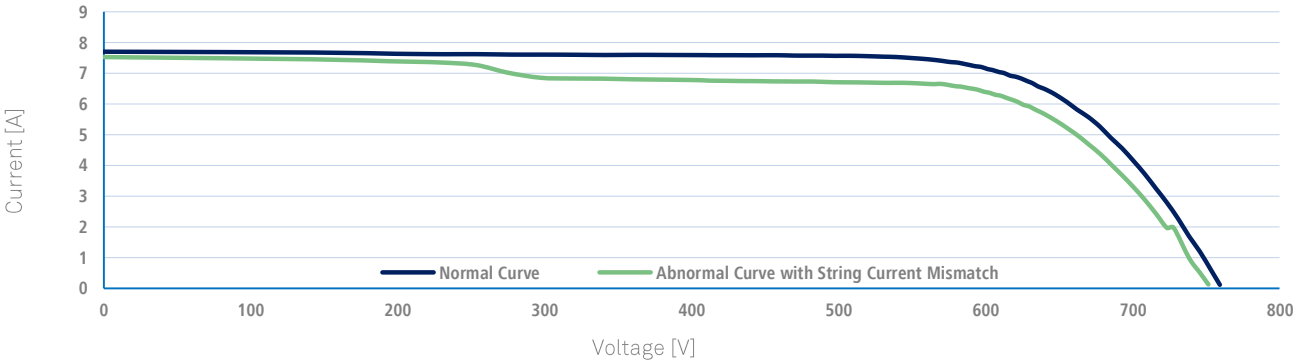
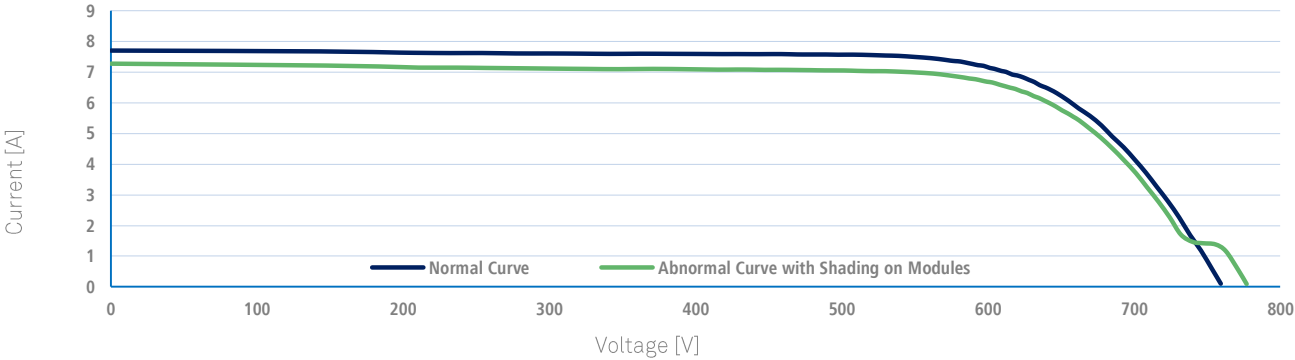
Technical Specifications	
Smart String Inverter	SUN2000-105KTL-H1, SUN2000-60KTL-M0, or newer
Data Logger	SmartLogger1000A, SmartLogger2000
Management System	NetEco1000S
Scanning Time	< 1s
Sampling Points per I-V Curve	128
Voltage Accuracy	0.5%rdg. + 1dgt. (rdg.>5, dgt.= 0.3)
Current Accuracy	0.5%rdg. + 2dgt. (rdg.>0.3, dgt.= 0.006)



Smart I-V Curve Diagnosis is TUV Verified

String-level Management	Smart I-V Curve Diagnosis
<p>Real time monitoring</p>	<p>Fault Analysis</p>

String I-V Curve Comparison



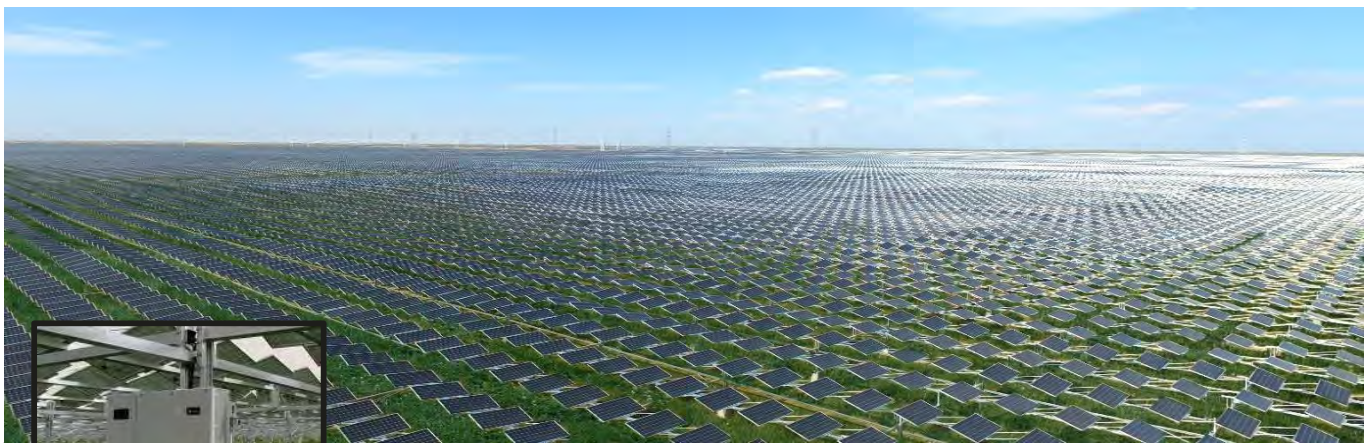
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Yanchi, Ningxia, China
Largest Single PV Plant Worldwide

Capacity
1 GW

Inverter Model
SUN2000-40KTL



Hongdunzi, Ningxia, China
Largest Tracking System PV Plant Worldwide

Capacity
700 MW

Inverter Model
SUN2000-50KTL



Haining, Zhejiang, China
Largest Rooftop-mounted PV Plant Worldwide

Capacity
300 MW

Inverter Model
SUN2000-28KTL,36KTL,50KTL



Golmud, Qinghai, China
Ground-mounted Smart PV Plant

Capacity
590 MW

Inverter Model
SUN2000-20KTL,28KTL,40KTL



Datong, Shanxi, China
Mountain-mounted Smart PV Plant

Capacity
100 MW

Inverter Model
SUN2000-40KTL



Sihong, Jiangsu, China
Water Surface Smart PV Plant

Capacity
100 MW

Inverter Model
SUN2000-100KTL



Delingha, Qinghai, China
Ground-mounted Smart PV Plant

Capacity
200 MW

Inverter Model
SUN2000-100KTL



Haixing, Hebei, China
Ground-mounted Smart PV Plant

Capacity
62 MW

Inverter Model
SUN2000-100KTL



Baicheng, Jilin, China
Ground-mounted Smart PV Plant

Capacity
26 MW

Inverter Model
SUN2000-100KTL



Lusaka, Zambia
Ground-mounted Smart PV Plant

Capacity
54 MW

Inverter Model
SUN2000-42KTL



Garissa, Kenya
Ground-Mounted Smart PV Plant

Capacity
50 MW

Inverter Model
SUN2000-42KTL



Weniba, Ghana
Ground-Mounted Smart PV Plant

Capacity
20 MW

Inverter Model
SUN2000-42KTL



Ghani, India
Ground-Mounted Smart PV Plant

Capacity
50 MW

Inverter Model
SUN2000-43KTL-IN



Krempendorf, Germany
Ground-mounted Smart PV Plant

Capacity
20 MW

Inverter Model
SUN2000-28KTL



Miyako-jima, Japan
Seashore Smart PV Plant

Capacity
2 MW

Inverter Model
SUN2000-28KTL



Boa Hora, Brazil
Ground-mounted Smart PV Plant

Capacity
75 MW

Inverter Model
SUN2000-60KTL-HV



Karaganda, Kazakhstan
Ground-mounted Smart PV Plant

Capacity
40 MW

Inverter Model
SUN2000-60KTL-HV



Requena, Valencia, Spain
Ground-mounted Smart PV Plant

Capacity
12 MW

Inverter Model
SUN2000-60KTL-HV



Aulander, NC, USA
Ground-mounted Smart PV Plant

Capacity
120 MW

Inverter Model
SUN2000-45KTL-US-HV-D0



Cuyama, CA, USA
Ground-mounted Smart PV Plant

Capacity
43 MW

Inverter Model
SUN2000-45KTL-US-HV-D0



Wilson, NC, USA
Ground-mounted Smart PV Plant

Capacity
20 MW

Inverter Model
SUN2000-25KT, 30KTL-US



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HUAWEI TECHNOLOGIES (U.A.E.) FZ LLC
P.O.Box 500327, 24th Floor, Thuraya Tower 1
Dubai Media City, Dubai, U.A.E.
Tel.: 00971-4-3688118
Fax: 00971-4-3688170
hwsmartpv@huawei.com

HUAWEI TECHNOLOGIES CO., LTD.
Huawei Industrial Base, Bantian Longgang
Shenzhen 518129, P.R. China
Tel.: 400-822-9999
solar.huawei.com