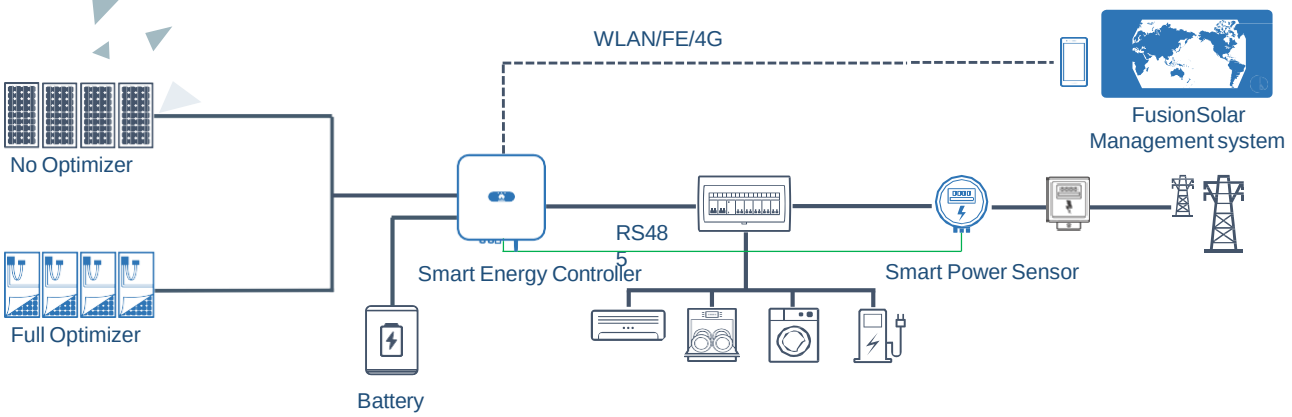
Residential PV Solution



Active Safety

AI Powered Active Arcing Protection

Pinpoint Arc Fault Positioning

Higher Yields

Up to 30% More Energy by Optimizers

2x POWER Battery Ready with More Energy

Better Experience

One-Fits-All Optimizer, Easier Business

Module Auto-Mapping within 5 sec



Smart Energy Controller



Active Safety

AI Powered
Active Arcing Protection

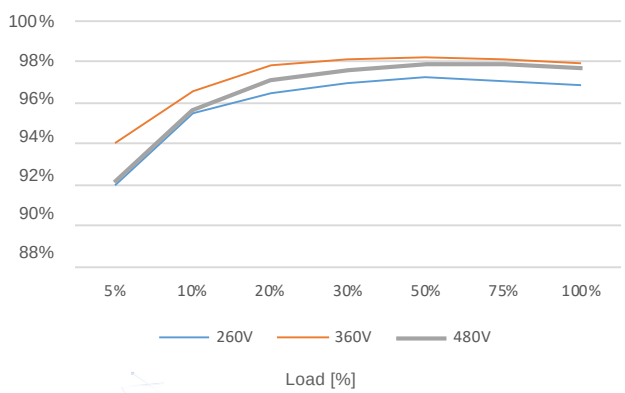
Higher Yields

Up to 30% More
Energy with Optimizer

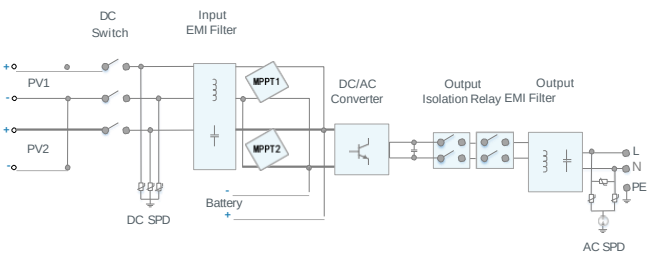
2x POWER Battery Ready

5KW AC Output plus
5KW Battery Charge

Efficiency Curve



Circuit Diagram



SUN2000-2/3/4/5/6KTL-L1

Technical Specification

Technical Specification	SUN2000 -2KTL-L1	SUN2000 -3KTL-L1	SUN2000 -4KTL-L1	SUN2000 -5KTL-L1	SUN2000 -6KTL-L1[1]
Efficiency					
Max. efficiency	98.2 %	98.3 %	98.4 %	98.4 %	98.4 %
European weighted efficiency	96.7 %	97.3 %	97.5 %	97.8 %	97.8 %
Input (PV)					
Recommended max. PV power [2]	3,000 Wp	4,500 Wp	6,000 Wp	7,500 Wp	9,000 Wp
Max. input voltage	600 V [3]				
Start-up voltage	100 V				
MPPT operating voltage range	90 V – 560 V [3]				
Rated input voltage	360 V				
Max. input current per MPPT	12.5 A				
Max. short-circuit current	18 A				
Number of MPP trackers	2				
Max. number of inputs	2				
Input (DC Battery)					
Compatible Battery	LG Chem RESU 7H_R / 10H_R				
Operating voltage range	350 ~ 450 Vdc				
Max operating current	10 A @7H_R / 15 A @10H_R				
Max charge power	3,500 W @7H_R / 5,000 W @10H_R				
Max discharge Power @7H_R	2,200 W	3,300 W	3,500 W	3,500 W	3,500 W
Max discharge Power @10H_R	2,200 W	3,300 W	4,400 W	5,000 W	5,000 W
Compatible Battery	HUAWEI Smart ESS Battery 5kWh – 30kWh [1]				
Operating voltage range	350 ~ 560 Vdc				
Max operating current	15 A				
Max charge Power	5,000 W [4]				
Max discharge Power	2,200 W	3,300 W	4,400 W	5,000 W	5,000 W
Output					
Grid connection	Single phase				
Rated output power	2,000 W	3,000 W	4,000 W	5,000 W [5]	6,000 W
Max. apparent power	2,200 VA	3,300 VA	4,400 VA	5,500 VA [7]	6,000 VA
Rated output voltage	220 Vac / 230 Vac / 240 Vac				
Rated AC grid frequency	50 Hz / 60 Hz				
Max. output current	10 A	15 A	20 A	25 A [8]	27.3 A
Adjustable power factor	0.8 leading ... 0.8 lagging				
Max. total harmonic distortion	≤ 3 %				
Backup power output	Yes (via Backup Box-5000 [1])				
Protection & Feature					
Anti-Islanding protection	Yes				
DC reverse polarity protection	Yes				
Insulation monitoring	Yes				
DC surge protection	Yes, compatible with TYPE II protection class according to EN/IEC 61643-11				
AC surge protection	Yes, compatible with TYPE II protection class according to EN/IEC 61643-11				
Residual current monitoring	Yes				
AC overcurrent protection	Yes				
AC short-circuit protection	Yes				
AC overvoltage protection	Yes				
Over-heat protection	Yes				
Arc fault protection	Yes				
Battery reverse charging from grid	Yes				
General Data					
Operating temperature range	-25 ~ +60 °C (Derating above 45°C @ Rated output power)				
Relative operating humidity	0 %RH ~ 100 %RH				
Operating altitude	0 ~ 4,000 m (Derating above 2,000 m)				
Cooling	Natural convection				
Display	LED indicators; integrated WLAN + FusionSolar APP				
Communication	RS485, WLAN via inverter built-in WLAN module Ethernet via Smart Dongle-WLAN-FE (Optional); 4G / 3G / 2G via Smart Dongle-4G (Optional)				
Weight (incl. mounting bracket)	12.0 kg (26.5 lb)				
Dimension (incl. mounting bracket)	365mm * 365mm * 156 mm (14.4 x 14.4 x 6.1 inch)				
Degree of protection	IP65				
Optimizer Compatibility					
DC MBUS compatible optimizer	SUN2000-450W-P				
Standard Compliance (more available upon request)					
Safety	EN/IEC 62109-1, EN/IEC 62109-2				
Grid connection standards	G98, G99, EN 50549-1, CEI 0-21, VDE-AR-N-4105, AS 4777.2, C10/11, ABNT, UTE C15-712, RD 1699, TOR D4, IEC61727, IEC62116, NOM, LAPEM				

*1 Available in 2020 Q3.
*2 Inverter max input PV power is 10,000 Wp when long strings are designed and fully connected with SUN2000-450W-P power optimizers.
*3 The maximum input voltage and operating voltage upper limit will be reduced to 495 V when inverter connects and works with LG battery.
*4 2,500 W @ 5kWh HUAWEI ESS battery
*5 AS4777.2: 4999W. *6. VDE-AR-N 4105: 4600VA / AS4777.2: 4999VA. *7. AS4777.2: 4999VA. *8. AS4777.2: 21.7A.

Smart String Energy Storage System



More Usable Energy

100% Depth of Discharge
Pack Level Energy Optimization

Flexible Investment

5kWh Modular Design,
Scalable from 5 to 30 kWh

Safe & Reliable

Lithium Iron Phosphate (LFP) Cell

Easy Installation

12 kg Power Module
50 kg Battery Module

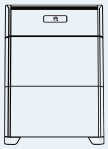
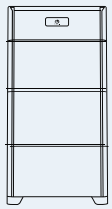
Quick Commissioning

Automatically Detected in App

Perfect Compatibility

Compatible to Both Residential
Single & Three Phase Inverter

Technical Specification

Technical Specification	LUNA2000-5-S0	LUNA2000-10-S0	LUNA2000-15-S0
			

Performance

Power module	LUNA2000-5KW-C0		
Number of power modules	1		
Battery module	LUNA2000-5-E0		
Battery module energy	5 kWh		
Number of battery Modules	1	2	3
Battery usable energy [1]	5 kWh	10 kWh	15 kWh
Max. output power	2.5 kW	5 kW	5 kW
Peak output power	3.5 kW, 10 s	7 kW, 10 s	7 kW, 10 s
Nominal voltage (single phase system)	450 V		
Operating voltage range (single phase system)	350 – 560 V		
Nominal voltage (three phase system)	600 V		
Operating voltage range (three phase system)	600 – 980 V		

Communication

Display	SOC status indicator, LED indicator
Communication	RS485 / CAN (only for parallel operation)

General Specification

Dimension (W*D*H)	670 * 150 * 600 mm (26.4 * 5.9 * 23.6 inch)	670 * 150 * 960 mm (26.4 * 5.9 * 37.8 inch)	670 * 150 * 1320 mm (26.4 * 5.9 * 60.0 inch)
Weight (Floor stand toolkit included)	63.8 kg (140.7 lb)	113.8 kg (250.9 lb)	163.8 kg (361.1 lb)
Power module dimension (W*D*H)	670 * 150 * 240 mm (26.4 * 5.9 * 9.4 inch)		
Power module weight	12 kg (26.5 lb)		
Battery module dimension (W*D*H)	670 * 150 * 360 mm (26.4 * 5.9 * 14.0 inch)		
Battery module weight	50 kg (110.2 lb)		
Installation	Floor stand (standard), Wall mount (optional)		
Operating temperature	-10℃ ~ + 55℃ (-4℉ ~ 131℉) [2]		
Operating altitude	0 - 4,000 m (13,123 ft.) (Derating above 2,000 m)		
Environment	Indoor / Outdoor		
Relative humidity	5% ~ 95%		
Cooling	Natural convection		
Protection rating	IP 66		
Noise emission	<29 dB		
Cell technology	Lithium-iron phosphate (LiFePO4)		
Scalability	Max. 2 systems in parallel operation		
Compatible inverters	SUN2000-2/3/3.68/4/4.6/5/6KTL-L1, SUN2000-3/4/5/6/8/10KTL-M0 [4], SUN2000-3/4/5/6/8/10KTL-M1		

Standard Compliance (more available upon request)

Certificates	CE, RCM, CEC, VDE2510-50, IEC62619, IEC 60730, UN38.3

Ordering and Deliverable Part

Product ordering model [5]	LUNA2000-5KW-C0, LUNA2000-5-E0, LUNA2000 Wall Mounting Bracket

1. Test conditions: 100% depth of discharge (DoD), 0.2C rate charge & discharge at 25℃
2. Charge/discharge derating occurs when the operating temperature from -20℃ to 5 ℃.& 45 ℃ to 55 ℃.
3. Refer to battery warranty letter for conditional application.
4. Available in Q1, 2021
5. Storage system is ordered and delivered in the form of power module and battery module separately with corresponding quantity.

Smart PV Optimizer



One-Fits-All Optimizer
Easier Business

<1.5 min Pairing with Inverter

<5s Module Auto-Mapping

Arc Fault Pinpoint
Positioning

Technical Specification	SUN2000-450W-P
Input	
Rated Input DC Power [1]	450 W
Absolute maximum input voltage	80 V
MPPT operating voltage range	8 - 80 V
Maximum Short Circuit Current (Isc)	13 A
Max. efficiency	99.5 %
Weighted efficiency	99.0 %
Overvoltage category	II
Output	
Max. output voltage	80 V
Max. output current	15 A
Output bypass [2]	Yes
Shutdown output voltage per optimizer [3]	0 V
Shutdown output impedance per optimizer	1k ohm ± 10 %
Standard Compliance	
Safety	IEC62109-1 (class II safety)
RoHS	Yes
General Data	
Dimension (W x H x D)	71 x 138 x 25 mm (2.8 x 5.4 x 1.0 inch)
Weight (including cables)	0.55 kg (1.2 lb.)
Installation part (optional)	Grounding Plate, Grounding Lug, PV Module Frame Plate
Input connector	MC4
Output connector	MC4
Output wire length	1.2 m (3.9 ft.) [4]
Operating temperature / humidity range	-40 ℃ ~ 85 ℃ [5] / 0 %RH ~ 100 %RH
Degree of protection	IP68
Compatible product	SUN2000-2/3/3.68/4/4.6/5/6KTL-L1, SUN2000-3/4/5/6/8/10KTL-M1, SUN2000-12/15/17/20KTL-M2

Long String Design (Full Optimizer)	SUN2000-2-6KTL-L1	SUN2000-3-10KTL-M1	SUN2000-12-20KTL-M2	SUN2000-30-40KTL-M3
Minimum optimizer number per string	4	6	6	6
Maximum optimizer number per string	25	50	50	26
Maximum DC power per string	5,000 W	10,000 W	10,000 W	10,000 W

*1 Rated power of the module at STC shall not exceed "Rated Input DC Power" of power optimizer. Modules with power up to +5% power tolerance are acceptable.
*2 Power optimizer is bypassed in the string connected to an operating inverter when it fails to work
*3 Power optimizer output 0Vdc when disconnecting to the inverter or inverter is shutdown.
*4 Fits PV module in landscape and portrait installation.
*5 Full power capability refers to online smart design tool.

Backup Box



Simple

Automatic detection & switchover

Reliable

Provide reliable backup power

Technical Specification	Backup Box-B0	Backup Box-B1
AC Output (On grid)		
Grid connection	Single Phase	Three Phase
Rated voltage	220 V / 230 V	380 V / 400 V
AC frequency	50Hz / 60Hz	
AC output voltage range	198 V ~ 253 V	342 V ~ 440 V
AC Output (Backup)		
Load connection	Single Phase	Single Phase
Rated voltage	220 V / 230 V	220 V / 230 V
AC frequency	50Hz / 60Hz	
Maximum apparent power	5,000 VA	3,300 VA
Maximum output current	22.7 A	15.2 A
Switchover time	＜3 s	
AC Input (Inverter)		
Rated voltage	220 V / 230 V	380 V / 400 V
AC frequency	50Hz / 60Hz	
Compatible inverter	SUN2000-2/3/3.68/4/4.6/5/6KTL-L1	SUN2000-3/4/5/6/8/10KTL-M1
General Specification		
Operating temperature range	-20 ℃ to +45 ℃ (-4 ℉ to 113 ℉)	
Relative humidity range	0 %RH～100 %RH	
Dimensions (W * H * D)	400 x 350 x 130 mm (15.8 x 13.8 x 5.1 inch)	
Weight	11 kg	
Degree of protection	IP 65	

Smart Dongle-WLAN-FE



Smart

WLAN & Fast Ethernet (FE) communication
Support 3rd-party monitoring system [1]

Simple

Plug & Play
Support max. 10 devices

Reliable

IP65
Support auto reconnection

Technical Specification	SDongleA-05
General Data	
Max. Devices Supported	10
Max. Inverters Supported	10
Connection interface	USB
Ethernet Interface	10/100M Ethernet
Installation	Plug-and-play
Indicator	LED Indicator
Dimensions (W * H * D)	146 x 48 x 33 mm (5.1 x 1.9 x 1.3 inch)
Weight	90 g (0.2 lb.)
Degree of protection	IP65
Power consumption (typical)	2.5 W
Operation Mode	STA
Encryption Algorithm	Encryption Mechanism：WPA/WPA2 Encryption：TKIP/CCMP/AES
Wireless Parameter	
Supported standards & frequencies	802.11b/g/n（2.412G—2.484G）
Environment	
Operating temperature range	-30 ℃ to +65 ℃ (-22 ℉ to 149 ℉)
Relative humidity range	5 - 95% RH
Storage temperature range	-40℃ to +70℃ (-40 ℉ to 158 ℉)
Max. operating altitude	4,000 m (13,123 ft.)
Standard Compliance (more available upon request)	
Certificate	SRRC, CE, RCM
Inverter Compatibility	
Supported Master Inverter Model	SUN2000-3/4/5/6/8/10KTL-M1 SUN2000-12/15/17/20KTL-M1

1: 3rd-party management system shall match the communication protocol with Huawei Smart Dongle.

Smart Dongle-4G



Smart

2G, 3G, 4G communication [1]
Support 3rd-party monitoring system [2]

Simple

Plug & Play
Support max. 10 devices

Reliable

IP65
Support auto reconnection

Technical Specification	SDongleA-03-AU
General Data	
Max. Devices Supported	10
Max. Inverters Supported	10
Connection interface	USB
Installation	Plug-and-play
Indicator	LED Indicator
Dimensions (W * H * D)	130 x 48 x 33 mm (5.1 x 1.9 x 1.3 inch)
Weight	90 g (0.2 lb.)
Degree of protection	IP65
Power consumption (typical)	3.5 W
Wireless Parameter	
Sim card type	mini-sim (15 mm*25 mm)
Supported standards & frequencies	4G: FDD-LTE / TDD-LTE 3G: WCDMA / HSDPA / HSUPA / HSPA+ 2G: GSM / GPRS / EDGE [3]
Environment	
Operating temperature range	-30 ℃ to +65 ℃ (-22 ℉ to 149 ℉)
Relative humidity range	5 - 95% RH
Storage temperature range	-40 ℃ to +70 ℃ (-40 ℉ to 158 ℉)
Max. operating altitude	4,000 m (13,123 ft.)
Standard Compliance (more available upon request)	
Certificate	RCM
Inverter Compatibility	
Inverter model	SUN2000-12/15/17/20KTL-M2 SUN2000-60KTL-M0

1: To ensure stable data transmission, Huawei suggests 4G dongle to be installed in areas with stable mobile signal (2G signal ≥4 bars, 3G/4G signal ≥3 bars).
2: 3rd-party management system shall match the communication protocol with Huawei Smart Dongle.
3. For recommended carriers list and details on supported frequencies, please contact local distributors.

FusionSolar Smart PV Management System



Simple & Swift

- Simple commissioning by APP
- Auto-detection of system equipment
- Registering your plant by scanning any device

Convenient & Reliable

- Energy flow illustration
- Real-time data at anytime from anywhere
- Performance data back-up

Improved O&M Experience

- Physical & logical module layout
- Module-level performance management*
- Smart I-V Diagnosis

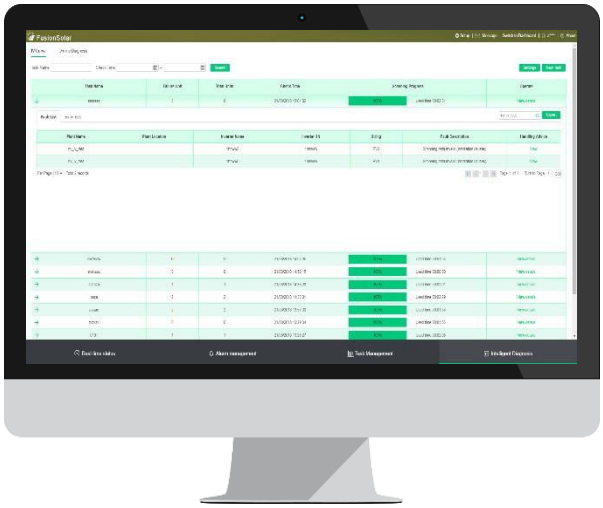
*Full optimizer solution with Smart PV Safety Box required

Feature List		WEB	APP
Basic Feature	Swift Installation & Registration	●	●
	Data Collection	●	
	Dashboard	●	●
	Energy Flow	●	●
	Energy Generation & Consumption	●	●
	Device Management	●	●
	Report Management	●	●
	Alarm Management	●	●
	System Configuration	●	
Advanced Feature	Intelligent O&M	○	
	Mobile O&M	○	○
	Proactive Diagnosis	○	○
	Smart I-V Curve Diagnosis	○	○

● Basic ○ Optional

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 faults, which would help to achieve proactive maintenance, higher O&M efficiency and lower operation cost.



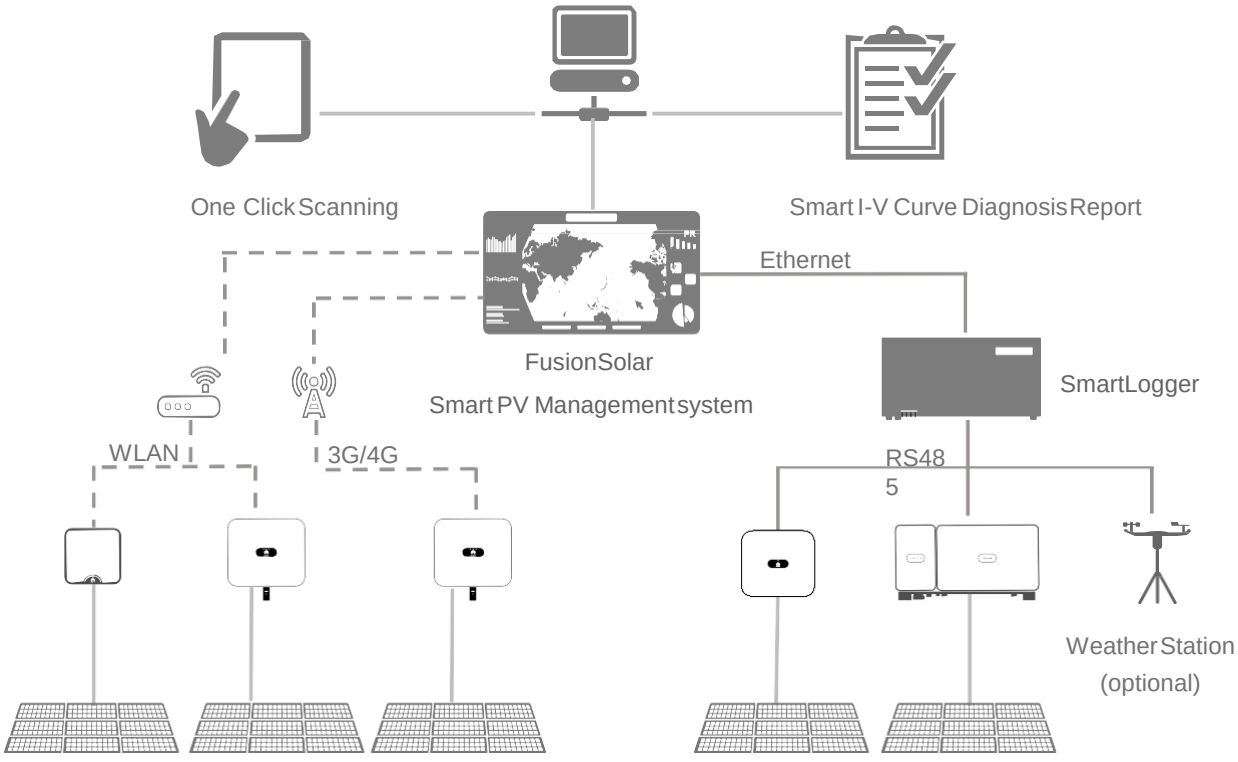
Smart

- 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
- Online I-V curve scanning on entire strings of 5 MW plant within 5min
- Automatic report generation of 5 MW plant within 15min

Network



Smart I-V Curve Diagnosis

Technical Specifications	Smart I-V Curve Diagnosis
Smart PV Inverter*	SUN2000L-2/3/4/5KTL, SUN2000-12/15/20KTL-M0, SUN2000-33KTL-A/36KTL, SUN2000-60KTL-M0
Communication	SmartLogger2000, SmartLogger1000A, SmartLogger1000, Smart Dongle
Management System	FusionSolar Smart PV Management System, NetEco1000s
Scanning Time	< 1s (1 string)
Sampling Points per I-V Curve	128
Certification	TÜVRheinland® TUV

* I-V curve diagnosis is not supported when inverter is connected with power optimizer.

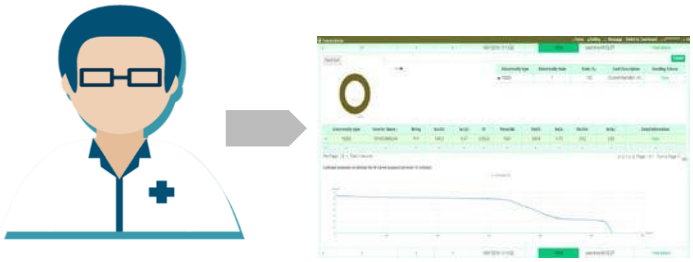
String-level Management

Real time monitoring

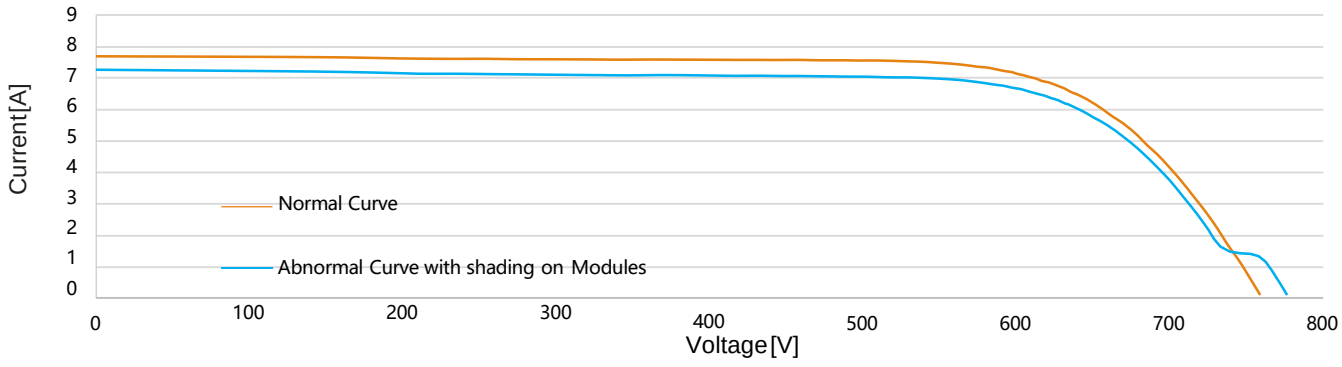


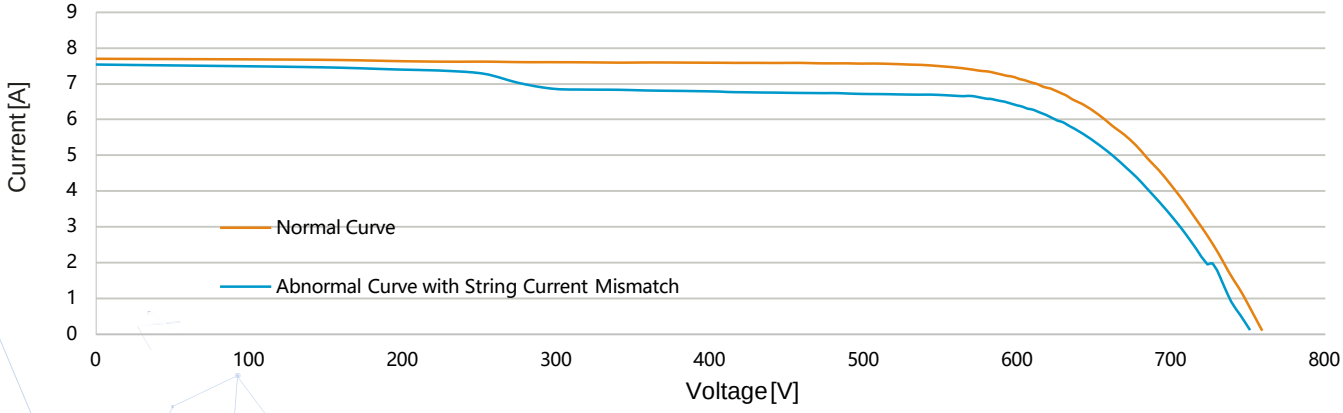
Smart I-V Curve Diagnosis

Fault Analysis



String I-V Curve Comparison





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