Huawei Solar Product Training



Contents

- Overview of the Product Range
- Huawei Solar Inverter Technical Information
- Huawei Smartlogger Technical Information
- NetECO Portal Brief Overview





Huawei Inverter Family

Full Range of Huawei Inverter Products On-Grid Solution New **SUN2000** @400V 36kTL 8/12kTL 17/20/23kTL 33KTL Small Commercial PV System **SUN2000** @480V MV 42kTL 28kTL Large Commercial PV Plants **Smart Logger** & NetEco **Smart Logger** iManager APP **Utility PV Plant**

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Recommended Design Specification:

D\/ Madula Tura	Max	number of Modules p	er String at Different M	linimum Ambient Tempe	erature
PV Module Type	-25 ℃	-20 ℃	-10 ℃	- 5 ℃	0 ℃
250 Wp (Poly,60cells)	22	23	23	23	24
255 Wp (Poly,60cells)	22	23	23	23	24
260 Wp (Poly,60cells)	22	23	23	23	24
265 Wp (Poly,60cells)	22	22	23	23	24
270 Wp (Poly,72cells)	22	23	23	23	24



^{*}To insure the modules STC per string does not exceed 1000V.

Recommended Design Specification:

		Layout factor ab	out 1.2, commonl	y in UK/Denmark			
PV Type	SUN2000-8KTL	SUN2000-12KTL	SUN2000-17KTL	SUN2000-20KTL	SUN2000-23KTL	SUN2000-28KTL	SUN2000-33KTL
250 Wp (Poly,60cells)	21 × 2	21 × 3	23 × 4	21 × 5	22 × 5	22 × 6	24 × 6
255 Wp (Poly,60cells)	21 × 2	21 × 3	22 × 4	21 × 5	22 × 5	22 × 6	23 × 6
260 Wp (Poly,60cells)	20 × 2	20 × 3	22 × 4	20 × 5	21 × 5	21 × 6	23 × 6
265 Wp (Poly,60cells)	20 × 2	20 × 3	21× 4	20 × 5	21 × 5	21 × 6	23 × 6
270 Wp (Poly,60cells)	20 × 2	20 × 3	21× 4	20 × 5	21 × 5	20× 6	22 × 6

	_	Layout factor ab	out 1.3, commonl	y in UK/Denmark			
PV Type	SUN2000-8KTL	SUN2000-12KTL	SUN2000-17KTL	SUN2000-20KTL	SUN2000-23KTL	SUN2000-28KTL	SUN2000-33KTL
250 Wp (Poly,60cells)	23 × 2	23 × 3	19 × 5	19 × 6	20 × 6	23 × 6	1
255 Wp (Poly,60cells)	22 × 2	17 × 4	19 × 5	22 × 5	23 × 5	23 × 6	1
260 Wp (Poly,60cells)	22 × 2	22 × 3	19 × 5	22 × 5	23 × 5	23 × 6	1
265 Wp (Poly,60cells)	22 × 2	22 × 3	23 ×4	18 × 6	19 ×6	23 × 6	1
270 Wp (Poly,60cells)	21 × 2	21 × 3	18 ×5	21 × 5	22 × 5	22 × 6	1







Recommended Fuse Specification:

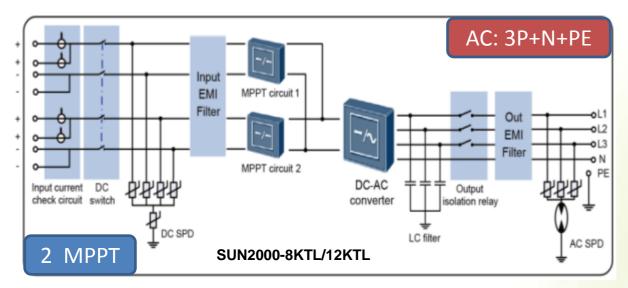
HUAWEI SUN2000	Rated AC Power (KW)	Rated Max AC Power (KW)	Max output Current	Recommended Fuse Spec
8KTL	8	8.8	12.8A	20A
12KTL	12	13.2	19.2A	32A
17KTL	17	18.7	27.2A	40A
20KTL	20	22	32.0A	50A
23KTL	23	23	33.5A	50A
28KTL	27.5	27.5	33.5A	50A
33KTL	30	30	48.0A	63 A







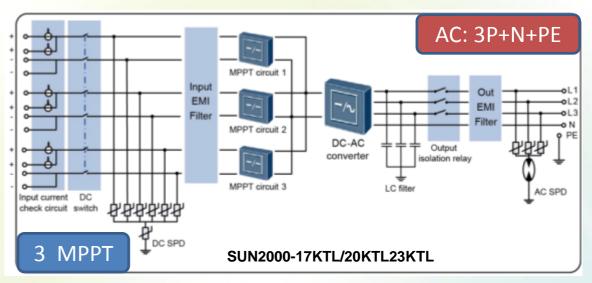
Circuit Diagram

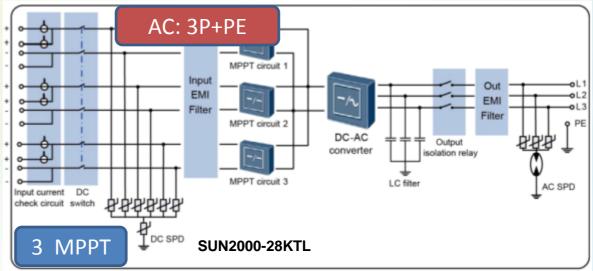


Huawei SUN2000 8 & 12 KTL

Huawei SUN2000 28KTL & 33KTL New firmware which will be available from March 2016

Huawei SUN2000 17, 20, 23 & 33KTL







Recommended AC Cable:

Inverter Model	Cable Type	Cross-sectional Area (mm²)		Cable Outer Diameter (mm)	
		Range	Recomme nded Value	Range	Recomm ended Value
SUN2000-33KT L	4-core outdoor cable (L1, L2, L3, and N)	16-25 (6-3 AWG)	16 (6 AWG)	24-32	28

Inverter Model	Cable Type	Type Cros		ional Area	External Cable Diameter (mm)	
	Range	Recommended Value	Range	Recommended Value	Range	Recommended Value
SUN2000 -8KTL SUN2000 -10KTL SUN2000 -12KTL SUN2000 -15KTL SUN2000 -17KTL SUN2000 -20KTL SUN2000 -23KTL	 4-core outdoor cable (3+N) 5-core outdoor cable (3+N+PE) 	4-core outdoor cable (3+N)	4–10 (12AWG– 8AWG) 6–10 (10AWG– 8AWG)	4 (12AWG) 6 (10AWG)	NOTE • When the outer cable diameter ranges from 11 mm to 13 mm, add cable clamps. • When the outer cable diameter ranges from 16 mm to 20 mm, strip a seal ring from the cable sealing cover interior. • When the outer diameter of an armored cable exceeds 20 mm, strip the jacket	
SUN2000 -24.5KTL	3-core outdoor	3-core outdoor cable			and armored layer and take waterproof and	
SUN2000 -28KTL	cable 4-core outdoor cable (3+PE)				ultraviolet-proof measures on the cable.	



Notes of AC Connector(Amphenol C16/3) Included & Cabling

- 1. 4/6 mm² flexible wires in common,10 mm² optional of stranded circular non compacted conductor (class 2 acc. to IEC60228), minimum 7 wires in the conductor.
- 2. When the outer cable diameter is more than 16mm, strip a seal ring from the cable sealing cover interior.



3. To remove an AC output connector, press the locking plate on the coupling nut using a flat-head screwdriver

4. If PGND cable is already installed with screw at the inverter, PE wire of the AC connector is not necessary. In this case, 3P+N is recommended for SUN2000 8-23KTL, 3P for SUN2000-28KTL.



Notes of DC Connector(Amphenol H4) Included & Cabling

4/6mm2 compatible

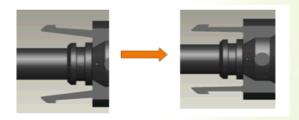


Female stamped and formed contacts (4,0-6,0mm²/AWG10-12) H4CFC5D..S



Male stamped and formed contacts
H4CMC5D..S

Improvement Available now





1.98mm->1.84mm

Essential Tool







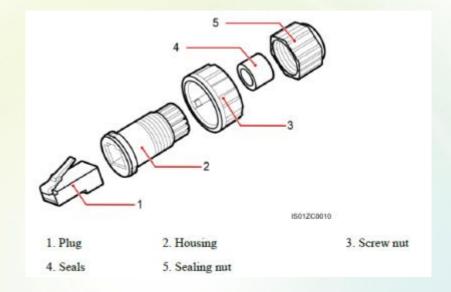


/0001 H41

Notes of RJ45 Outdoor Connector Included & Cabling

- 1. 2 Sets for each inverter, RJ45 plug without load bar
- 2. 24 AWG outdoor shielded network solid wire cables recommended and external diameter of 4.5 mm to 7.5 mm
- 3. Alternative choice to buy RJ45 plug with load bar for solid and stranded conductors 24/26AWG

EFB-Elektronik RJ45-CAT6-Crimp-STP-Stecker



High Performance Modular Plugs von TE Tyco Electronics (AMP Netconnect)

Shielded / 8/8 / Round Solid 5-5699550-2 (500/ Box) 5699550-3 (100/ Box) (for solid conductors)

Shielded / 8/8 / Round Solid 5-5699552-2 (500/ Box) 5699552-3 (100/ Box) (for stranded conductors)

Recommended Outdoor Cable: Etherline FD P BK CAT.5 (CE217489) 4x2x AWG26/19

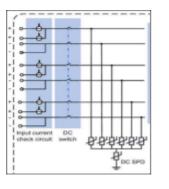
LAPP KABEL STURGART ETHERLINE® CAT.5 FD BK

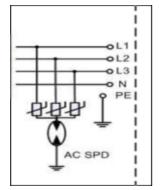


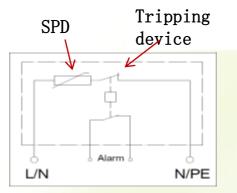
Surge protection—10kA Class/Type II DC and AC Integrated



DC side SPD I_n is 10kA







Product model	PV20K510-MH
Supplier	HPXIN
Rated Voltage	230 VAC
Maximum	510 VAC /
Continuous Uc	820VDC
Nominal	
discharge current-	10 kA (8/20µs)
In	
Maximum	
discharge current	20 kA (8/20µs)
-lmax	

Product model	PV20K385-MH
Supplier	HPXIN
Rated Voltage	230 VAC
Maximum Continuou Uc	385 VAC / 505VDC
Nominal discharg current-In	e 10kA (8/20μs)
Maximum discharg current -lmax	e 20kA (8/20μs)

AC side SPD I_n is 10kA

System design recommendation:

1. The SUN2000 inverter reaches level II protection level on the DC side, and is able to handle typical inductive lightning shocks to be faced in PV system. In series with tripping device, when SPD leakage current increase it will be tripped and prevent catching fire .Therefore, no separate SPD component is required on the DC side.

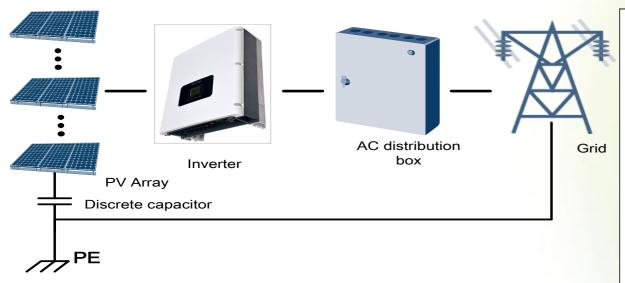
2. The SUN2000 inverter reaches level II protection level on the AC side, and is able to handle normal electric surges. However, if the installation site is expected to face frequent thunderstorm weather, and if the AC wiring is very long, it is recommended to add separate higher grade SPD component in the AC combiner box.

Residual Current Protection Integrated in SUN2000 series Inverter for Safety

Residual current: means the current between inverter and the PE(protecting earth).

Safety requirement VDE0126-1-1 defines the residual current value. It is forced requirements for the inverters.

- 30mA definition is to avoid electrical strike to human beings
- 300mA definition is to avoid catching fire in the buildings



4.7.1 Photovoltaics

A residual current monitoring unit (RCMU) is required for inverters without simple separation between the grid and the photovoltaic generator. In the event of a failure, the d.c. and a.c. component of the residual current depend on the type of inverter and the d.c. voltage of the PV generator.

An external residual current device is required in a disconnection device without an integrated RCMU. In this case, the tests defined in 6.6. do not apply. The residual current device required should be specified by the manufacturer in the operating instructions.

The generator-side insulation resistance before the switch to the grid must be $\geq 1 \text{ k}\Omega/V$ relative to the maximum inverter input voltage, and at least 500 k Ω . Leakage currents greater than 300 mA must trigger a break within 0.3 s. Irrespective of the rated power of the inverter, any sudden residual currents should trigger a break as in Table 1.

Table 1 - Maximum break times

r.m.s. value of residual current/(mA)	Break time/(s)
30	0.3
60	0.15
150	0.04







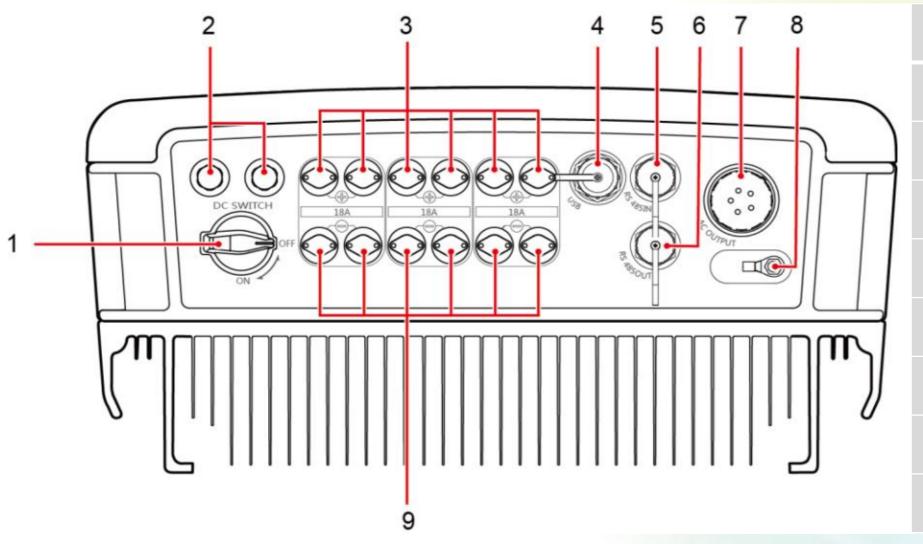


Front

Bottom

Side





1	DC switch
2	Ventilation valve
3	DC input port (positive)
4	USB port
5	RS 485 IN port
6	RS485 OUT port
7	AC output port
8	Ground bolt
9	DC input port(negative)



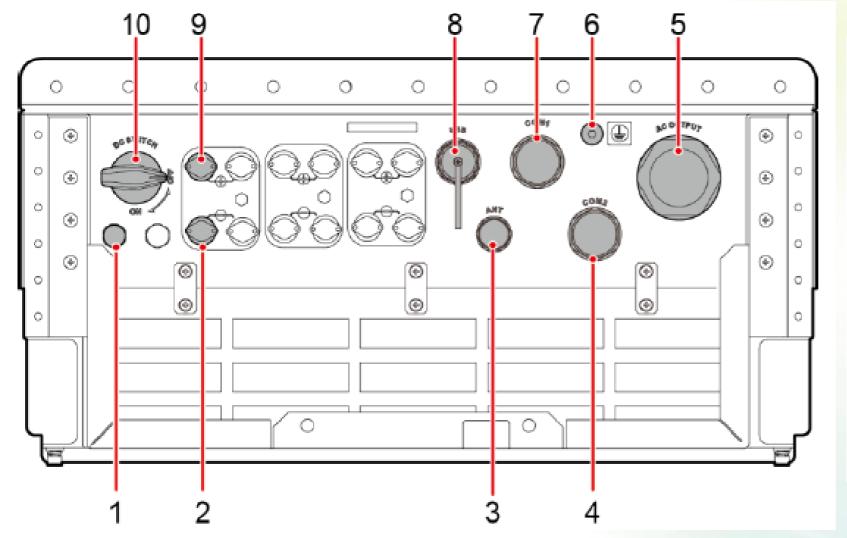






Side

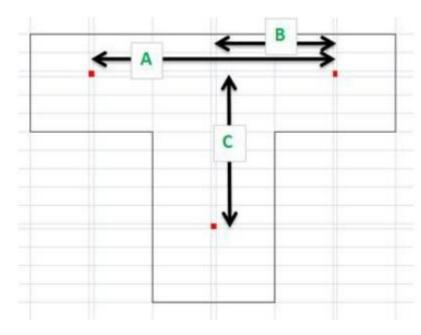




No.	Component Name (Silk Screen)		
1	Vent valve		
2	Negative DC input terminal (-)		
3	Antenna (ANT)		
4	RS485 output port (COM2)		
5	AC output port (AC OUTPUT)		
6	Protective earthing (PE) bolt		
7	RS485 input port (COM1)		
8	USB port (USB)		
9	Positive DC input terminal (+)		
10	DC switch (DC SWITCH)		



Recommended Design Specification:

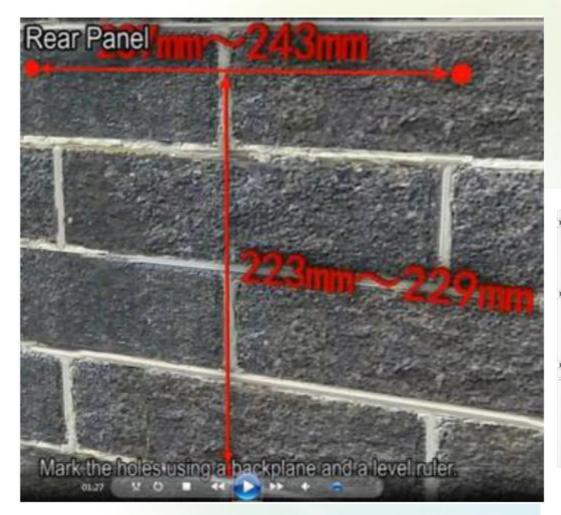


Mounting Bracket mounting holes dimension:

Length A: 237-243mm

Length B: half of above

Length C: 223-229mm

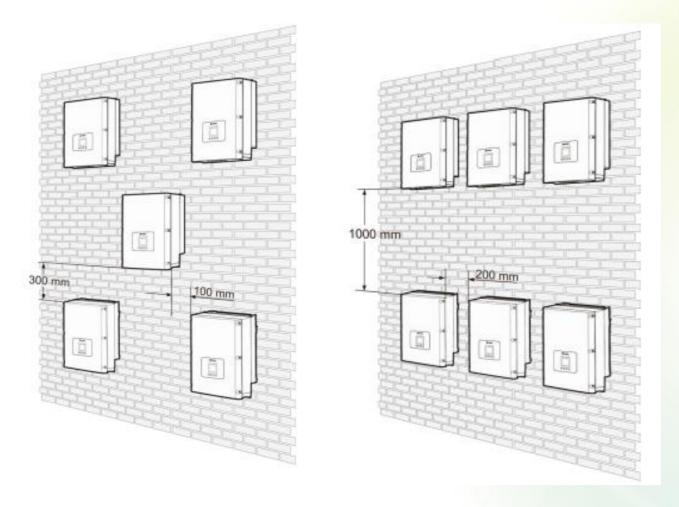


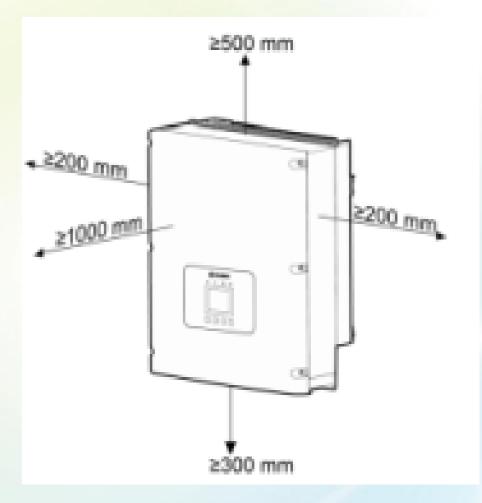






Installation of Sun2000- On the wall (Video)







Installation of Sun2000- On the support



SUN2000 can also be mounted on the support in same steps.

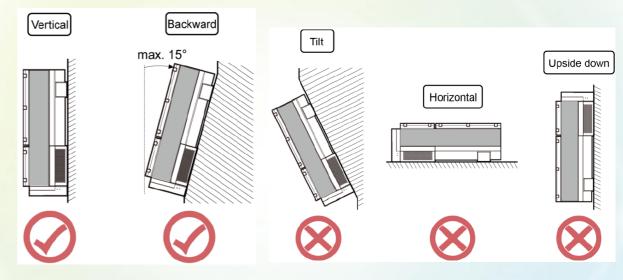
Note: The distance between the inverters can be less than indoor application (10 cm recommended).



Installation Mounting



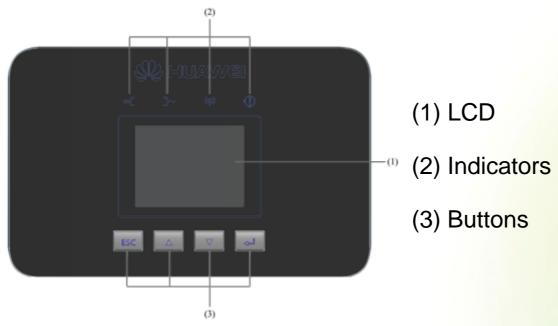
• Install the inverter upright or at a maximum back tilt of 15 degrees to facilitate heat dissipation.



 Do not install the inverter at a front tilt, excessive back tilt, or side tilt, horizontally, or upside down.



LCD Monitoring— Screen & Indicators

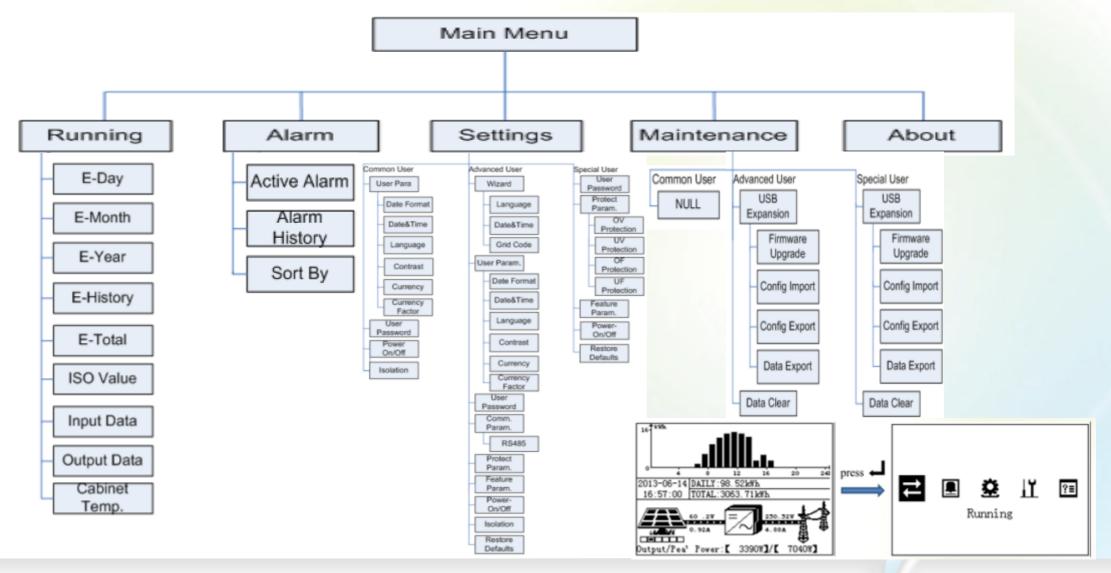


	_	
Button	Name	Function
ESC	Return	Allows you to return to the last page or end an operation.
	Up	Allows you to go to the upper-level menu or set parameters.
	Down	Allows you to go to the lower-level menu or set parameters.
	Confirm	Allows you to go to a menu or confirm a value.

Indicator Status		Description
PV connection indicator	Steady green	The SUN2000 connects to at least one of the PV arrays properly.
=[Off	The SUN2000 disconnects from all PV arrays.
Grid tie	Steady green	The SUN2000 connects to the power grid properly.
indicator]~	Off	The SUN2000 disconnects from the power grid.
Wireless connection indicator	Reserved	Reserved (The wireless function is not available in this version.)
	Steady red	A critical alarm is generated.
Alarm indicator	Blinking red (on for 0.5s and then off for 0.5s)	A minor alarm is generated.
	Blinking red (on for 1s and then off for 4s)	A warning is generated.



LCD Monitoring—Main Menu



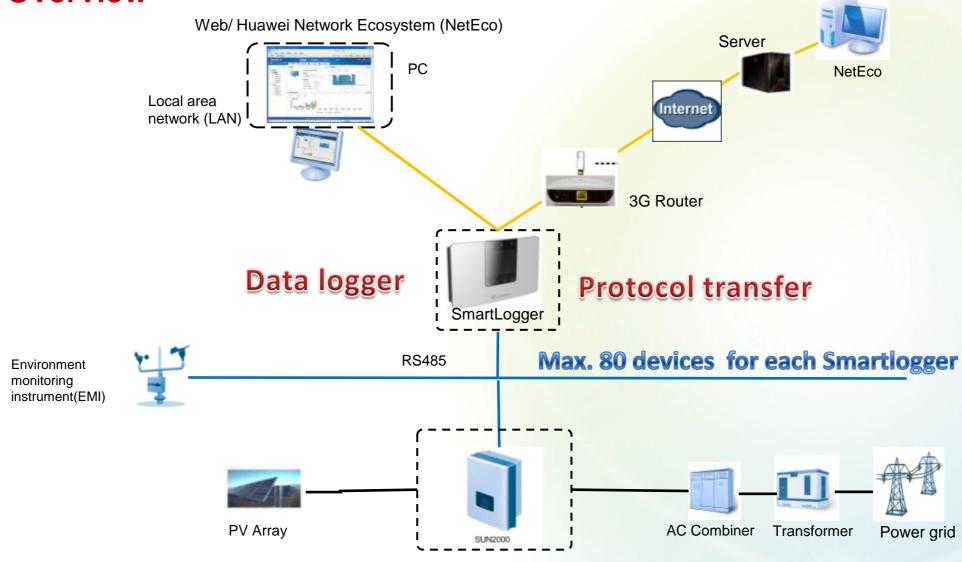
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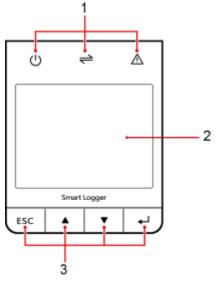




Overview



Appearance



- 1. Indicator
- 2. LCD
- 3. Button



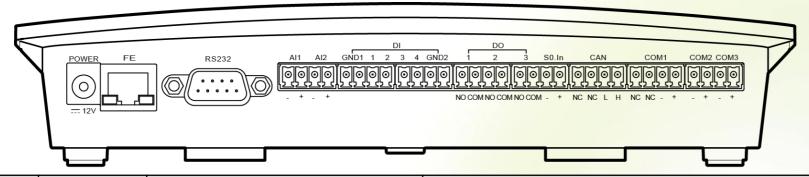


Indicator	Status	Meaning
Power /	Steady green	The power supply is normal.
indicator 🖤	Off	There is no power supply.
Run indicator	Blinking green (on for 1s	The SmartLogger is working.
	and then off for 1s)	
	Off	The SmartLogger stops working.
Alarm	Steady red	The inverter connected to the SmartLogger
indicator //		generates a major alarm.
	Blinking red (on for 0.5s	The inverter connected to the SmartLogger
	and then off for 0.5s)	generates a minor alarm.
	Blinking red (on for 1s and	The inverter connected to the SmartLogger
	then off for 4s)	generates a warning
	Off	The inverter connected to the SmartLogger is
		working normally.

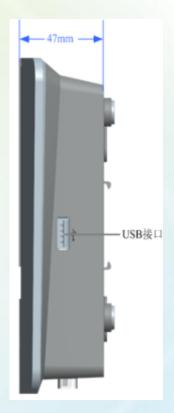
Buttons	Name	Function
ESC	Return button	Allows you to return to the last page or end an
		operation.
•	Cursor Down	Allows you to go to the upper-level menu or set
	button	parameters.
	Cursor Up button	Allows you to go to the lower-level menu or set
		parameters.
Ĺ	Confirm button	Allows you to go to the menu or confirm the
		value.



Appearance



Port	Quantity	Function	Description
POWER	1	Power supply	12 V DC
FE	1	Ethernet	100 M Ethernet, connects to a PC or router
RS232	1	RS232	(Reserved)
Al	2	Analog parameter input	12 V power supply current type (Reserved)
DI	4	Digital parameter input	Connects to the power grid dispatching signals controlled by dry contacts.
DO	3	Digital parameter output	Relay output
S0.In	1	Connects to pulse output meters.	(Reserved)
CAN	1	CAN	(Reserved)
СОМ	3	RS485	Connects to inverters and other PV devices.
USB	1	USB	Connects a USB device to download or upgrade





Installation- Desk mounting

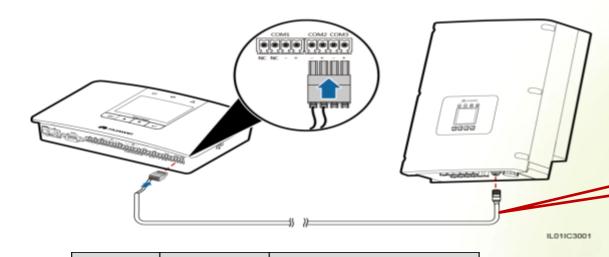


□Note:

- 1. Place the SmartLogger on a horizontal desk, and face the cable connection area downwards.
- 2. Do not place the SmartLogger in a place that may touch cables. The cables must be secured.

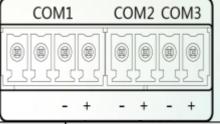


Installation- Connect to inverter



Recommended Cable

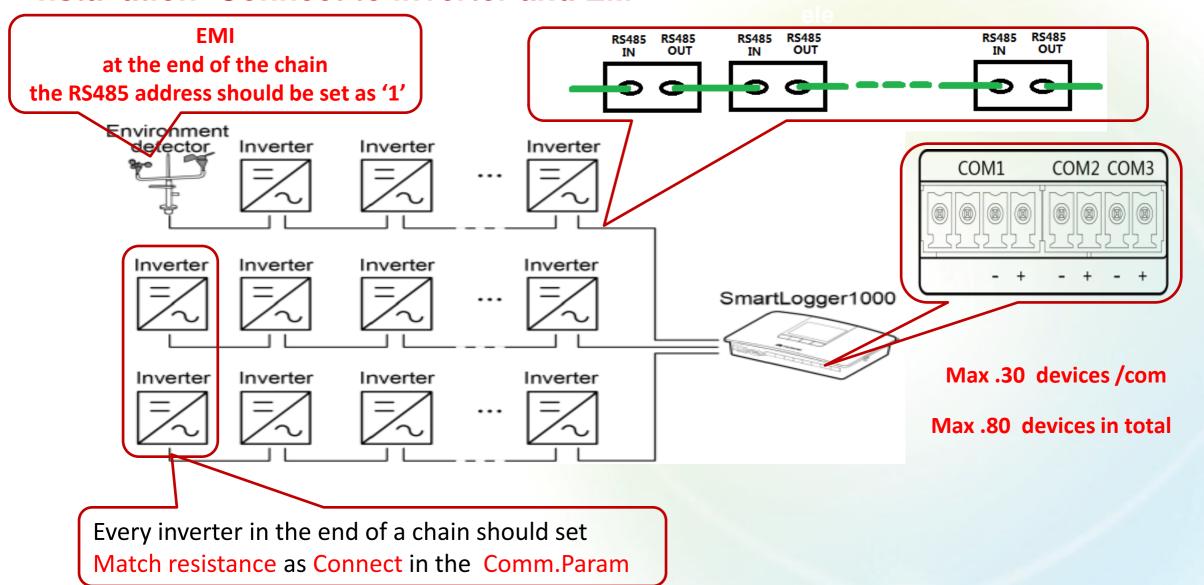
CAT 5E outdoor shielded network cable



	Category	Color	Function
1 8 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	White and orange	RS485A, RS485 differential signal +
	2	Orange	RS485B, RS485 differential signal
	3	White and green	PGND
	4	Blue	RS485A, RS485 differential signal +
	5	White and blue	RS485B, RS485 differential signal -
	6	Green	PGND
	7	White and brown	PGND
	8	Brown	PGND

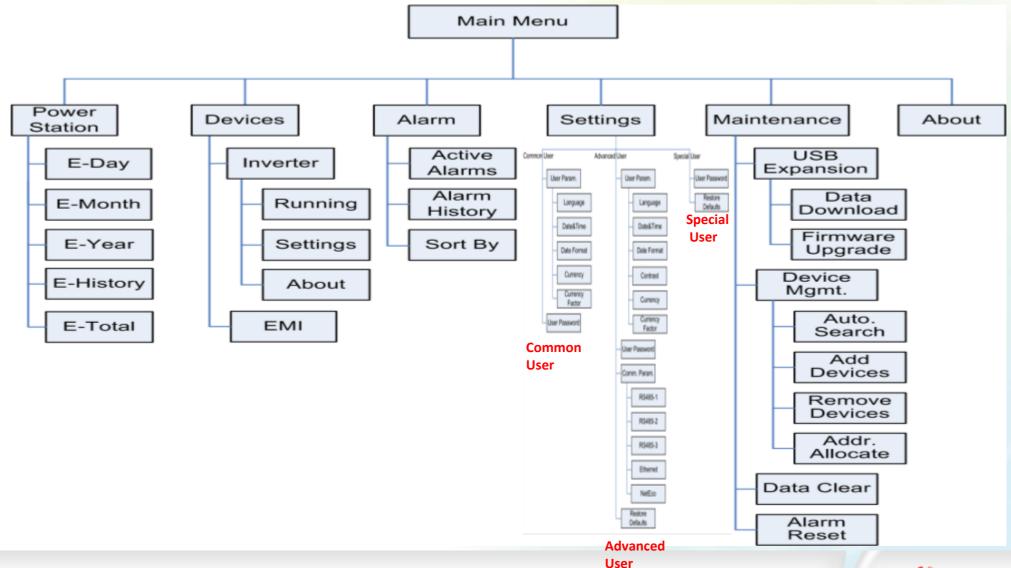
Port	Identifier	Function
COM1 port	NC	NC: Reserved
	NC	NC: Reserved
	_	-: RS485 differential signal -
	+	+: RS485 differential signal +
COM2 port	-	-: RS485 differential signal -
	+	+: RS485 differential signal +
COM3 port	-	-: RS485 differential signal -
	+	+: RS485 differential signal +

Installation- Connect to inverter and EMI





Function-LCD Main Menu



WebUI- Hardware prepare

Operating system requirement of PC		
Operating system	Windows	
Browser	Internet Explorer 7.0/8.0/9.0 Firefox 17.0/18.0/19.0/20.0/21.0	
Minimum resolution	1024 x 768	

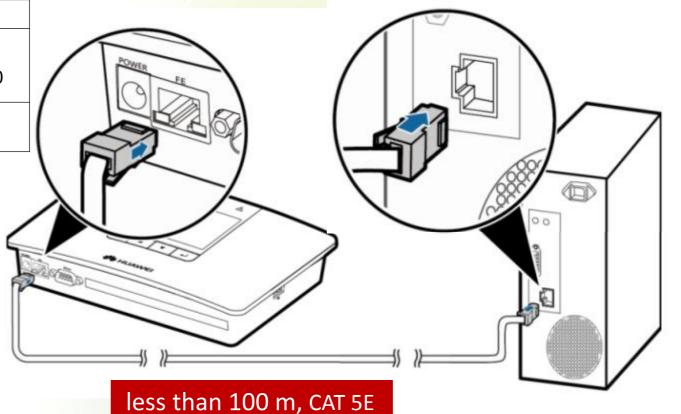
Default parameters:

IP address: 192.168.0.10 Subnet mask: 255.255.255.0 Gateway: 192.168.0.1

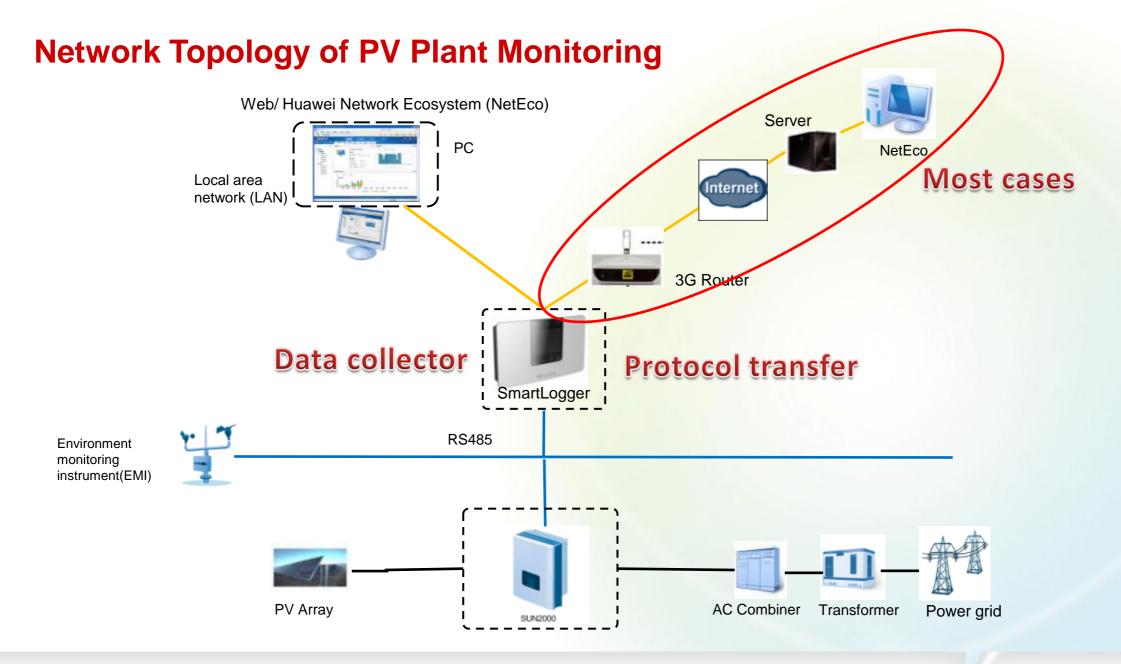
IP of Smartlogger and PC should be in the same segment

e.g. Smartlogger: 192.168.0.10

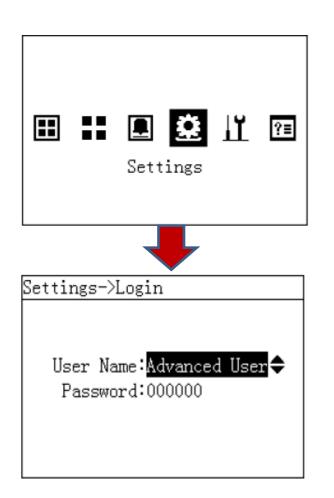
PC: 192.168.0.11

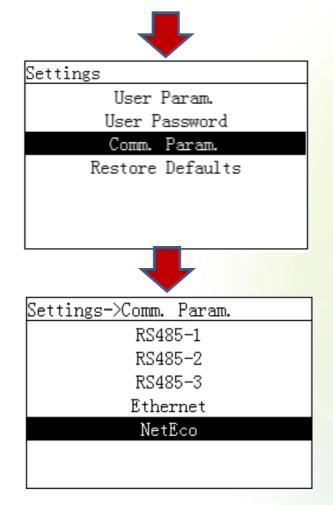


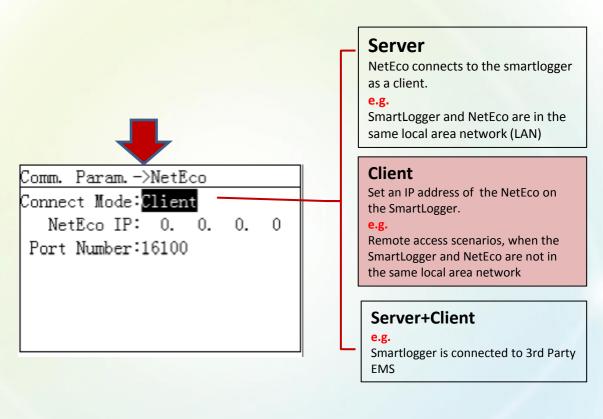




Connect to Neteco server – Make sure Smartlogger connected to server









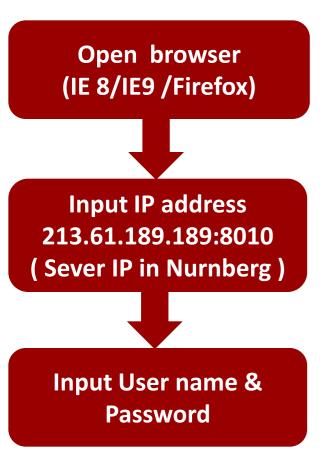
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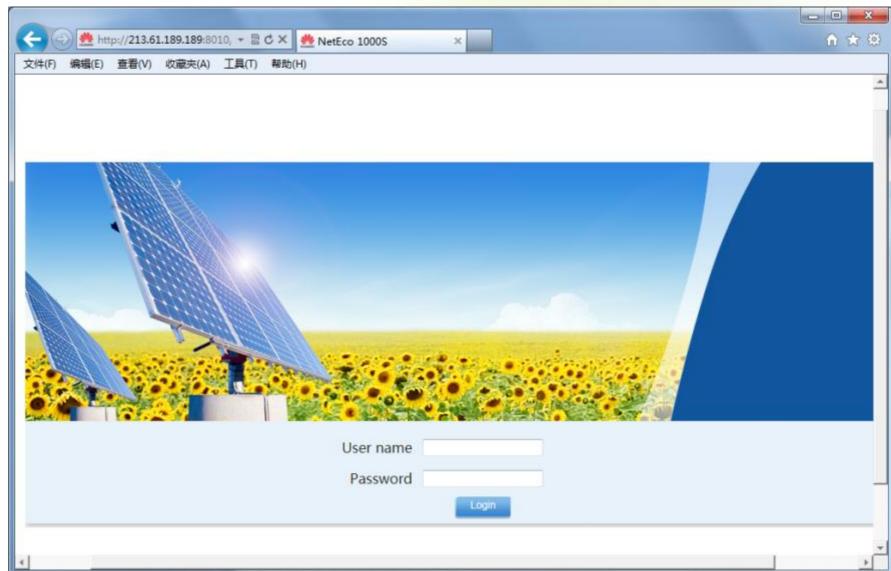
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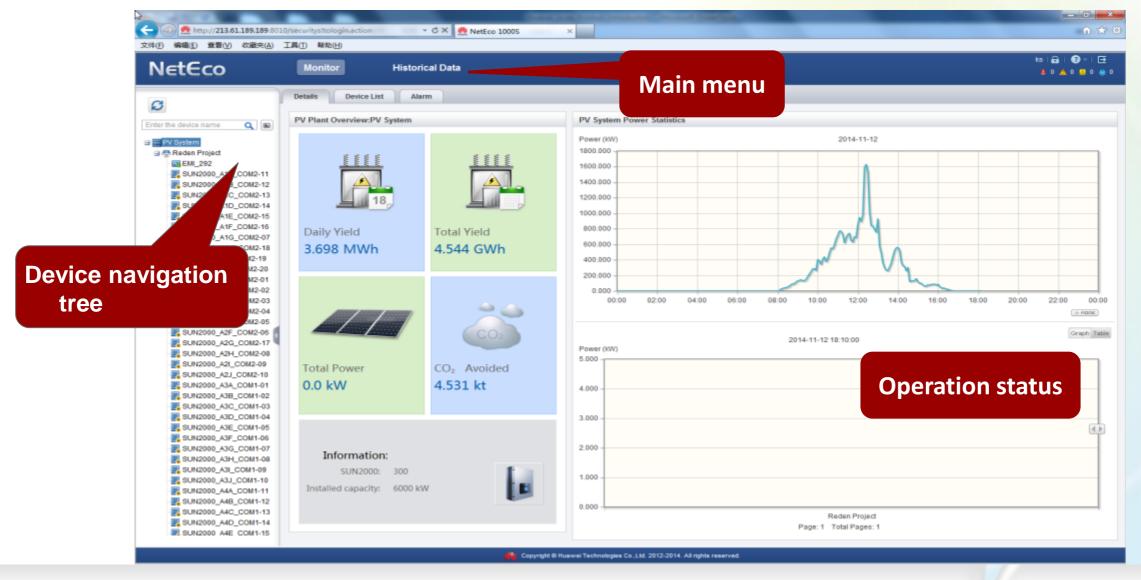
Neteco Web-Login through Browser



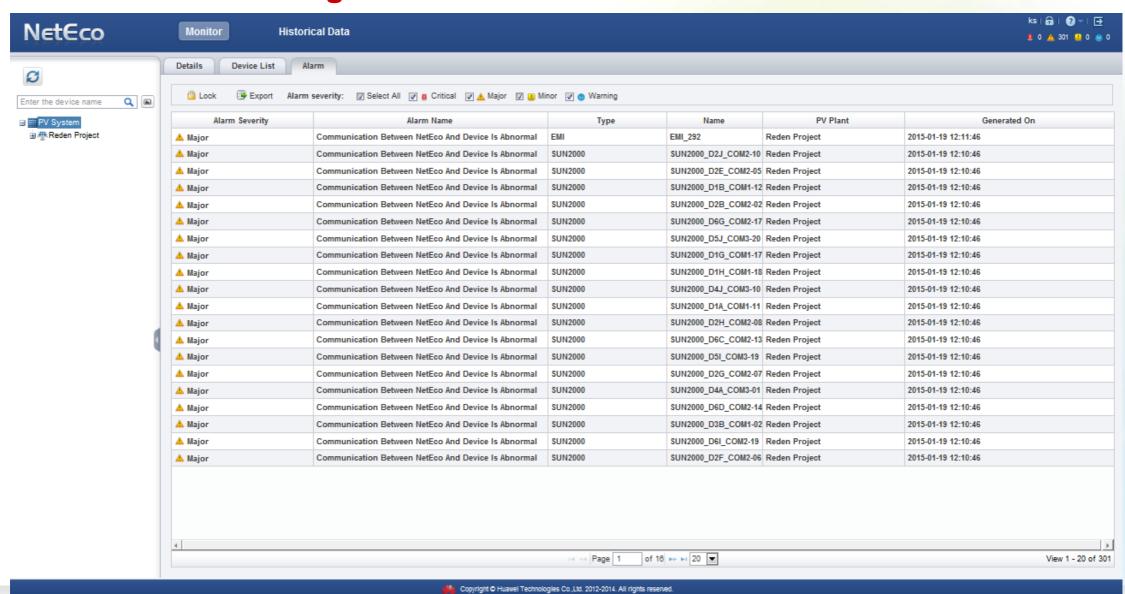




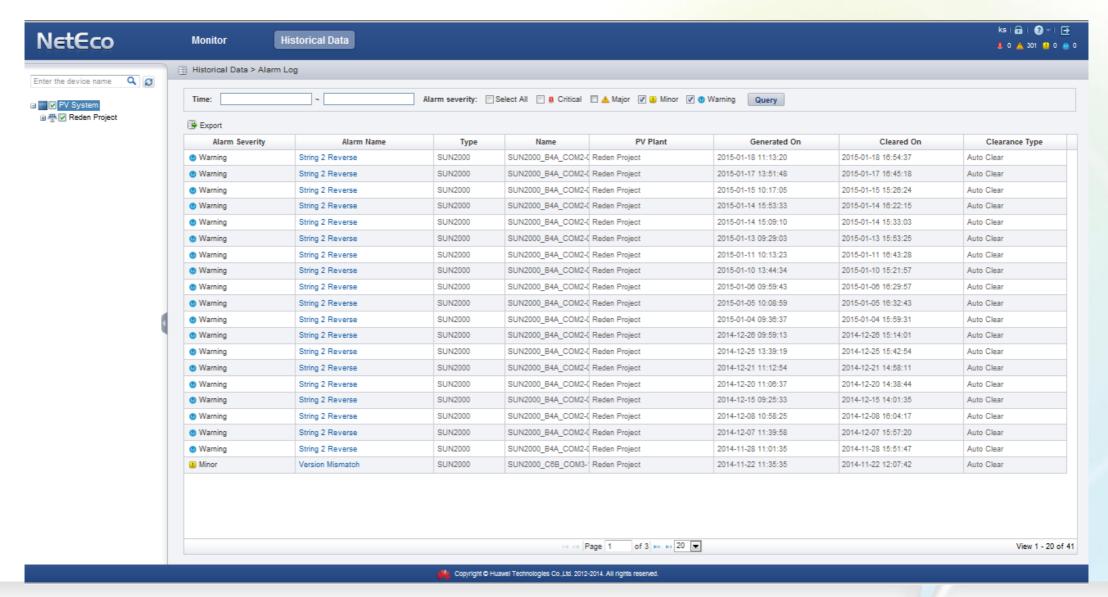
Neteco Web-Interface



Neteco Web- Monitoring



Neteco Web- Querying Alarm log



Neteco- Report Email

SUN2000_E6D_COM3-14

SUN2000 E6B COM3-12

SUN2000_E4H_C0M2-08

SUN2000_E3J_COM2-20

18680.76

18841.73

18708.48

18941.56

14

15

16

17

₩ 5 0 4 × F PV Plant Report (2015-01-28 22:00) - 邮件 (HTML) 开发工具 huaweinuremberg@163.com 发件人: | Zhoutao (Steven); 🥮 dengliming; 🧡 Zhouliang (Bruce); 😻 Stephan Linz; 🔾 Roland Huempfner; 🔾 Chenguoguang; 😻 Kuangsai; 🤭 Chengpengfei 收件人: 抄送: 主题: PV Plant Report (2015-01-28 22:00) Time: 2015-01-28 00:00~2015-01-28 22:00 Total Day Energy: 2037.00kWh Total Energy: 4816414.90kWh PV Plant Name: Reden Project Total DC Power: 7857.750kWp Total Energy: 4816414.90kWh Day Energy: 2037.00kWh Day Performance Ratio: 78.26% Number of Inverters: 300 Inverter Average Spec. Energy: 0.26kWh/kWp Maximum Spec. Energy: 0.28kWh/kWp Minimum Spec. Energy: 0.13kWh/kWp Ratio Threshold of Average Spec. Energy: 80.00% Inverters below Ratio Threshold: Device Name Total Energy(kWh) Day Energy(kWh) Spec. Energy (kWh/kWp) Ratio of Average SUN2000_E6I_COM3-19 3.56 0.13 51.30% 17663.87 SUN2000_E6H_COM3-18 18046.76 4.12 0.15 59.37% SUN2000_E3I_C0M2-19 18492.67 4.42 0.17 63.69% SUN2000 C4C COM3-03 18239.53 5.06 0.19 72.92% SUN2000_D4I_COM3-09 5.10 18734.73 0.19 73.49% SUN2000 A1D COM2-14 4.99 0.19 73.98% 17655.06 6.13 0.23 88.33% SUN2000_E2H_COM1-08 19076.64 0.23 SUN2000_E6J_COM3-20 23450.54 6.17 88.91% SUN2000 E6G COM3-17 18763.18 6.34 0.24 91.36% 10 SUN2000_E6E_C0M3-15 18864.92 6.36 0.24 91.65% 11 6.36 0.24 91.65% SUN2000 E6A COM3-11 18942.65 12 SUN2000_E6C_C0M3-13 8206.23 6.39 0.24 92.08% 92.23% SUN2000_E6F_C0M3-16 8228.71 6.40 0.24

6.41

6.41

6.42

6.44

0.24

0.24

0.24

0.24

92.37%

92.37%

92.51%

92.80%

Neteco APP-Installation

Search 'Neteco' in app shops



iOS (>5.0)



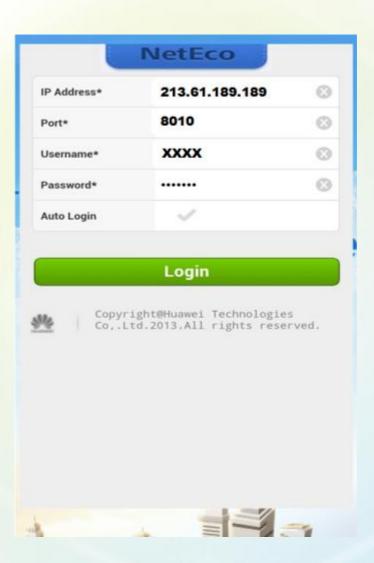
Android (>4.0)



SUN2000- App

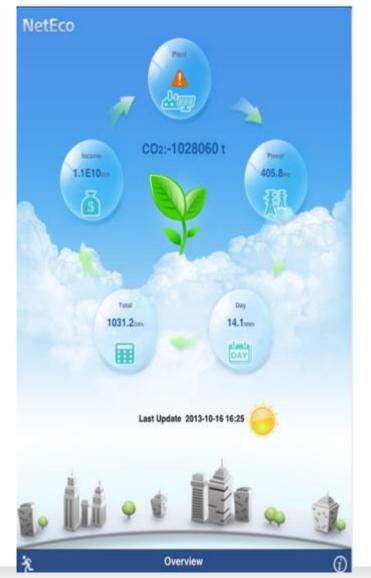








APP- PV plant in your hand







New Products:

- Huawei SUN2000 36KTL LV 400V
- Huawei SUN2000 42KTL MV 480V









Thank you.

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