SMARTEC Technologies

MPPT SOLAR CHARGE CONTROLLER

SUNTRACK-80

Takes Power Directly from the Sun through Solar panels

يأخذ طاقة مباشرة من الشمس من خلال الألواح الشمسية

English User Manual

Version: 2.6

3 Years Warranty

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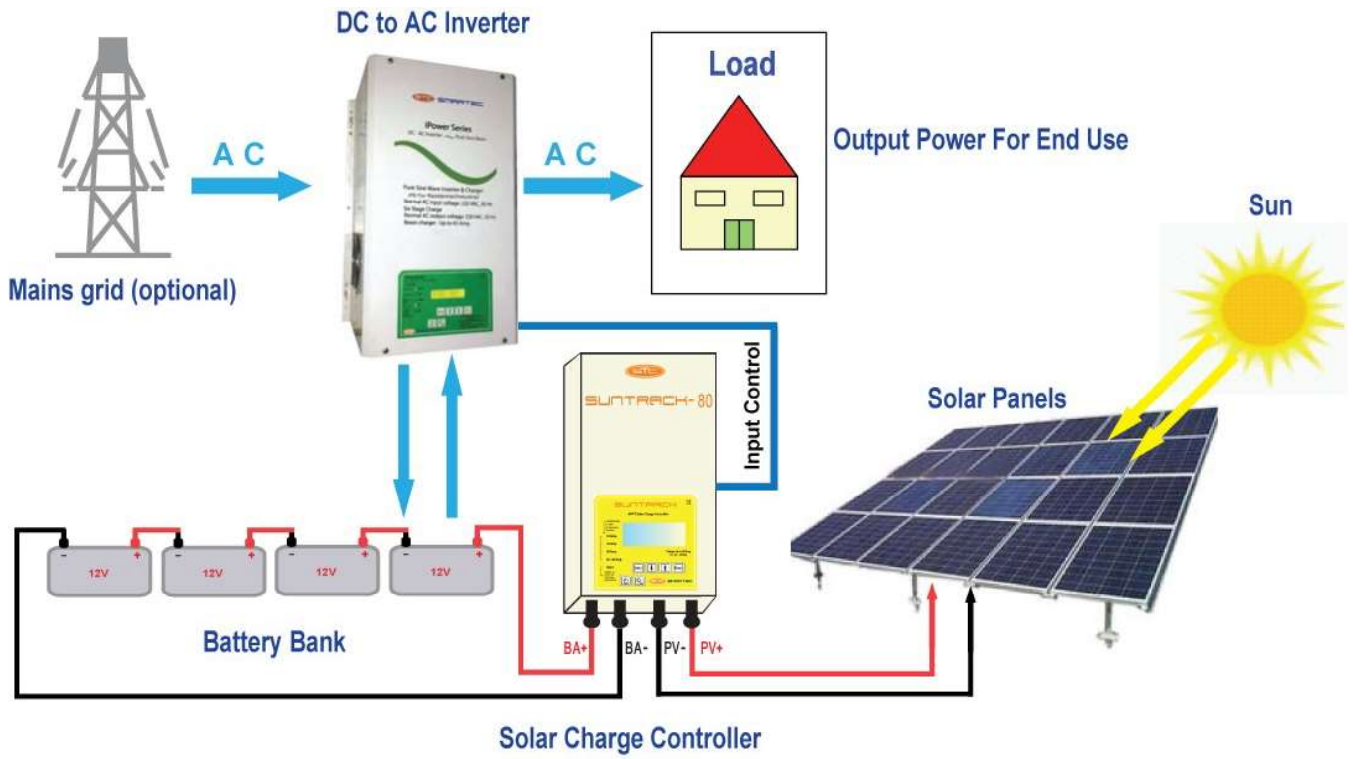
Solar Energy:



Solar energy is simply energy provided by the sun. This energy is in the form of solar radiation which makes the production of solar electricity possible.
Electricity can be produced directly from photovoltaic PV cells. These cells are made from materials which exhibit the photovoltaic effect, that is when the sunshine hits the PV cell, the photons of light excite the electrons in the cell and cause them to flow generating electricity.
Solar energy produces no emissions.

Solar PV power reduces the amount of electricity a client has to purchase from its utility or electric service provider. This will help the client to save money from electricity bills and provide the client with fixed energy costs.

Solar panels are extremely easy to install and after installation they require very little maintenance.
Solar PV panels are also ideal sources to provide power to remote devices, small shops, home appliances, pharmacy, gas stations and boarder areas that has no electricity coverage.

The Solar Charge Controller SUNTRACK takes Power directly from the Sun through Solar Panels

منظم الطاقة الشمسية يأخذ طاقة مباشرة من الشمس من خلال الألواح الشمسية

Solar Charge Controller:

The Solar Charge Controller SUNTRACK takes power directly from the solar panels through the sun . It contains the MPPT algorithm that continuously tracks the maximum power point and automatically charges the batteries in an optimal way with all the available solar power.

Maximize the energy generated from Solar Panels by adding a SUNTRACK Solar Charge Controller with maximum power point tracker (MPPT) to any solar installation.

UP to 80A / Battery voltage: 12V,24V,48 V
Up to 150 Volt input PV voltage range

Product Features:

- Easy and safe commissioning with full protection against incorrect wiring.
- High conversion efficiency > 99 %.
- Up to 4 units SUNTRACK solar charger in parallel.
- 6 steps charger for longer battery life.
- Display with 5 LED showing status and current.
- Low self-consumption: < 1 W in night time mode.
- Comprehensive display, programming and data logging.
- Real Time Clock.
- 3-Phase Rectifier.

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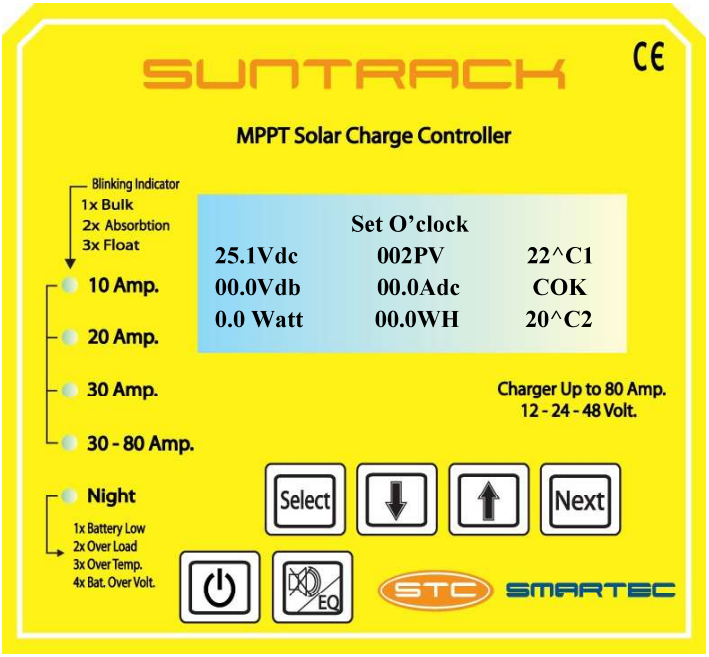
SPECIFICATIONS OF SUNTRACK :

At Nominal Battery Voltage	12 v	24 V	48 V
Maximum Solar power Recommended (at STC)	1250 W	2500 W	5000 W
Maximum Solar Open Circuit Voltage	80 Vdc	150 Vdc	
Maximum Solar Functional Circuit Voltage	75 Vdc	145 Vdc	
Maximum Output Current	80 Amps at 104 ºF (40 ºC) with adjustable current limit		
NEC Recommended Solar Array STC Nameplate	12 Vdc systems 1000 Watts 24 Vdc systems 2000 Watts 48 Vdc systems 4000 Watts		
PV Open Circuit Voltage (VOC)	150 Vdc absolute maximum coldest conditions 145 Vdc Start-up and operating maximum		
Standby Power Consumption	Less than one watt typical		
Status Display	2 Lines Display		
Charging Regulation	6 stages: Bulk, Absorption, Floating, Equalization, Reduced Floating and Periodic Absorption		
Voltage Regulation Set Points	10 to 48 Vdc adjustable with password protection		
Battery Temperature Compensation (available with accessory BTS-01)	-3 mv/ ºC/ cell(25 º C) default value adjustable -8 to 0 mv/ º C		
Operating Ambient Temperature Range	-20 to 55 º C		
Power Conversion efficiency(in a 48V typical-system)	> 99 %		
Maximum Standby Self Consumption (48 V)	25 mA > 1.2 W		
Maximum Standby Self Consumption (24 V)	30 mA > 0.8 W		
Maximum Standby Self Consumption (12 V)	35 mA > 0.5 W		
PV Reverse Polarity	Up to -150 Vdc		
Battery Reverse Polarity	Up to -150 Vdc		
Warranty	3 years		
Over Temperature	Protected		
Mounting Location	Indoor		
Parallel Operation (Separated PV arrays)	Up to 4 devices in parallel and up to 320 Amps		
CE Compliant	EMC 2004/108/CE, LV 2006/95/CE ROHS 2002/95/CE		
Data Logging	Last 365 days of operation: Amp Hours, Watt Hours, Time in Float, Peak Watts, Amps, Solar array voltage, Max Battery voltage, Min battery voltage, total accumulated Amp Hours & KW Hours of production		

The Solar Charge Controller SUNTRACK takes Power directly from the Sun through Solar Panels

منظم الطاقة الشمسية يأخذ طاقة مباشرة من الشمس من خلال الألواح الشمسية

SUNTRACK Screen:



Press **ON/OFF** button for 3 sec then release to toggle controller ON/OFF.

○ **10Amp** (LED): Current present on the output of the controller.

10 Amp (LED) blinks/ flash 1 time → Load search mode
10 Amp (LED) blinks/ flash 2 times → Feedback disabled.
10 Amp (LED) blinks/ flash 3 times → input/ output connection error.

○ **20 Amp** (LED): Current present on the input of the controller.

20 Amp (LED) blinks/flash 1time → Input limited mode

○ **30 Amp** (LED): is OFF, charging batteries.

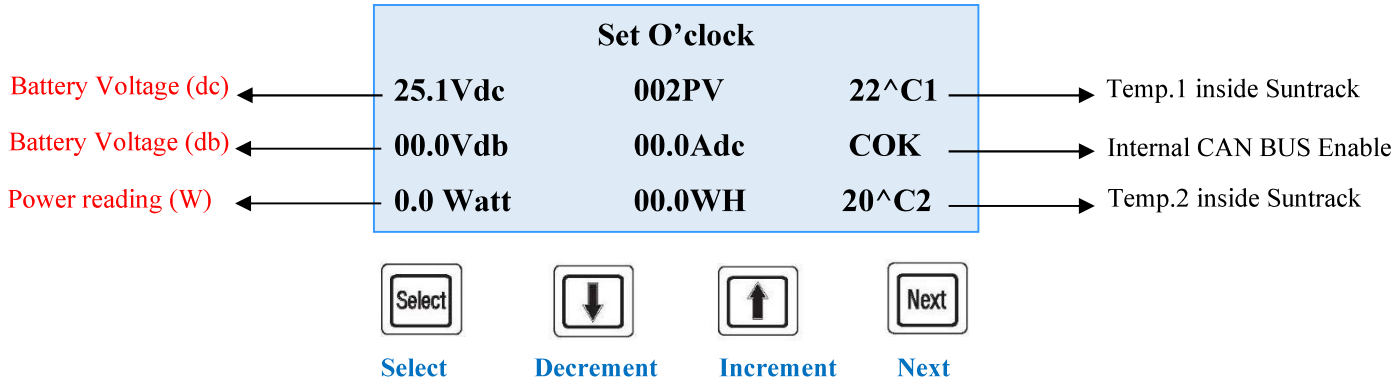
Charge (LED) blinks/flash 1 time → Bulk charging stage.
Charge (LED) blinks/flash 2 times → Absorption charging stage.
Charge (LED) blinks/flash 3 times → Float charging stage.

● **30-80 Amp** (LED) : Controller is on .
ON (LED) blinks/flash 1 time → Auto restart from shut down sequence.

○ **Night** (LED): Charger is off.
OFF (LED) is on → Controller is off.
OFF (LED) blinks/flash 1 time → Battery is low.
OFF (LED) blinks/flash 2 times → DC current overload.
OFF (LED) blinks/flash 3 times → Controller is over heated.
OFF (LED) blinks/flash 4 times → Battery over volt.

Turn ON the MPPT Controller:

Press on button for 3 sec to turn ON the MPPT controller. This will appear on the screen.



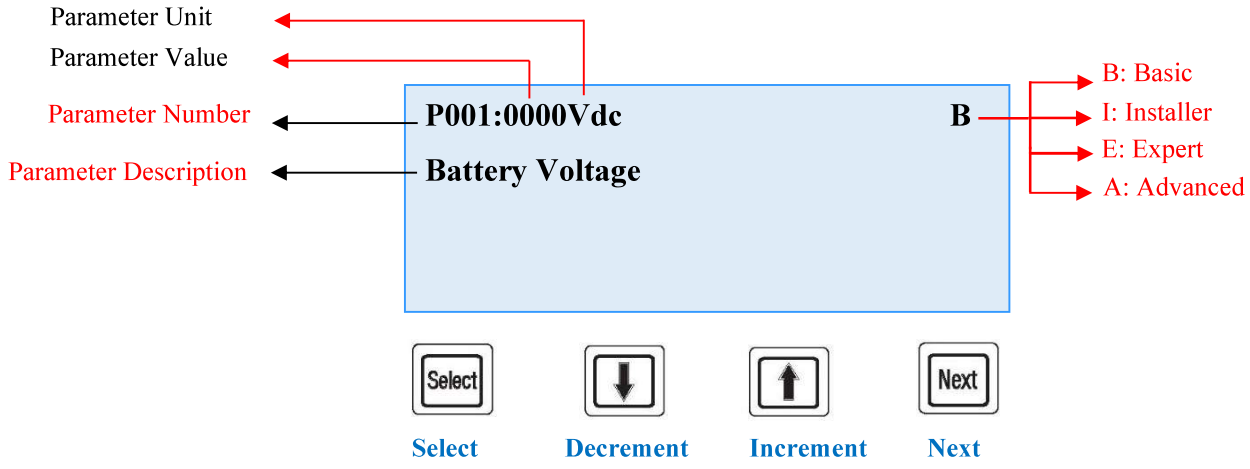
002PV: PV Voltage
00.0Adc: DC current reading

00.0WH:
- Total Watt hour (for more than 1 day)
- DWH: Daily Watt hour

COK:
- CC1: CAN BUS connected to one device
- CC2: CAN BUS connected to two devices

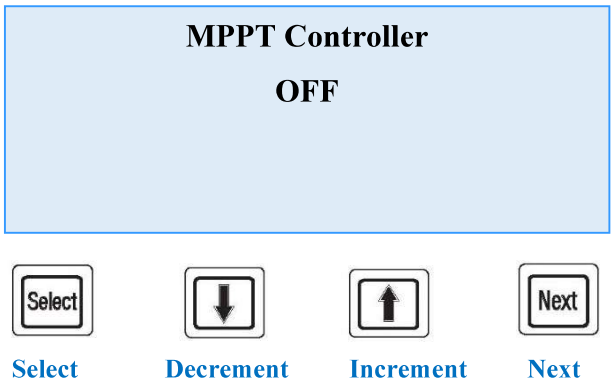
Enter Programming:

Press on **Select** and **Decrement** buttons together for 10 sec to enter parameter screen.

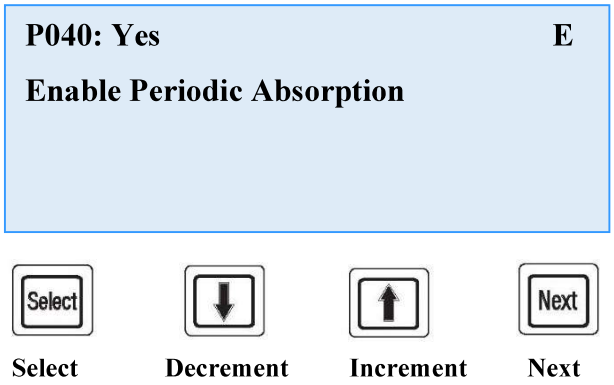


Decrement and Increment buttons are used to switch between the parameter Numbers.
Press on Increment button to see the next parameter number.
Press on Decrement button to see the previous parameter number.

Note: If you don't press on any button for 1 minute, this will appear on the screen.

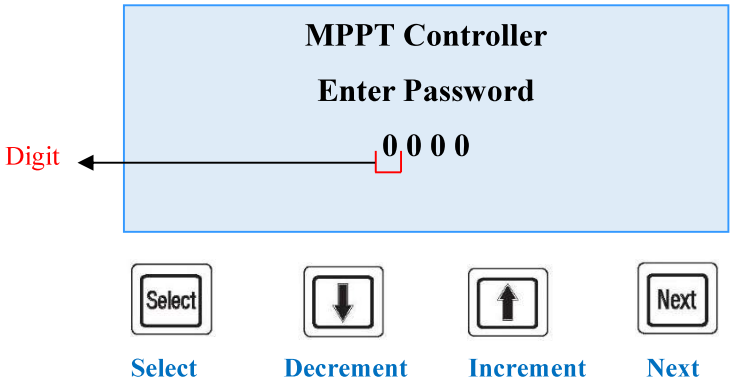


So press on Decrement or Increment Buttons to enter the Parameter Screen.
Note: It appears on the screen the parameter that you reached before it shows on the screen **(MPPT controller OFF)**



Enter the password:

Press on Select button and wait until password appears.

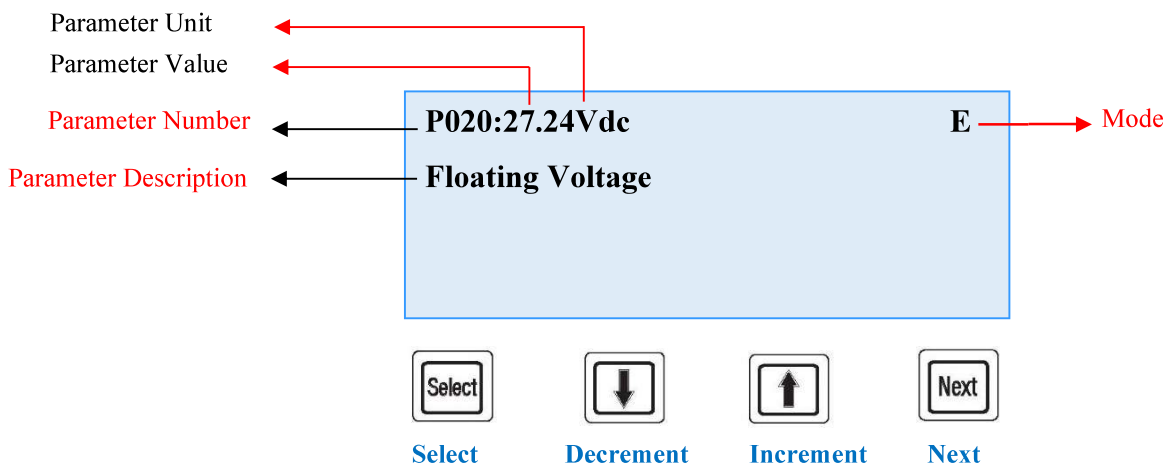


Default password: 0000
Required Password: 9999

Increment button is used to increase number.
Decrement button is used to decrease number.
Next button is used to move to the next digit.
Select button is used to save the password.

(Note): *Installer, Expert and Advanced password: must be obtained from manufacture*

Edit a Parameter Value:

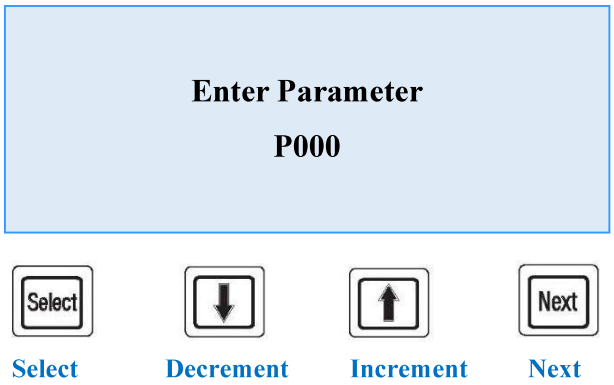


Note: the parameter value begins flashing from right to left.

Press on **Select** button until parameter value flashes.
Press on **Increment** button to increase value.
Press on **Decrement** button to decrease value.
Press on **Next** to move the cursor from one digit to another.
Press on **Select** button to save the value.
The mode **E** also flashes, so press on **Select** button another time to save and go to another parameter.

Edit a specific Parameter :

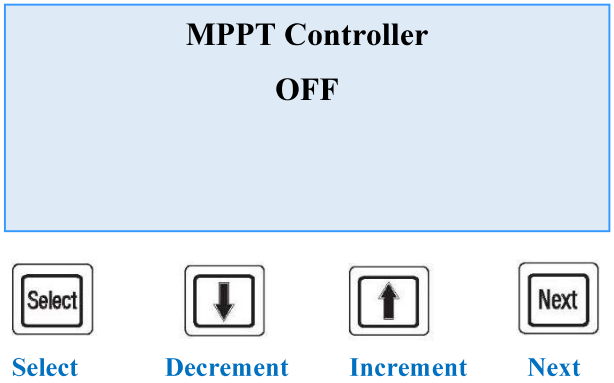
Press on **Decrement** and **Increment** buttons together for 3 sec to enter a specific parameter.



Press on **Increment** button to increase number.
Press on **Decrement** button to decrease number.
Press on **Next** button to move from one digit to another.
Press on **Select** button to save the parameter you entered.

Turn OFF The MPPT Controller:

Press on button for 5 sec to turn OFF the MPPT controller. This will appear on the screen.



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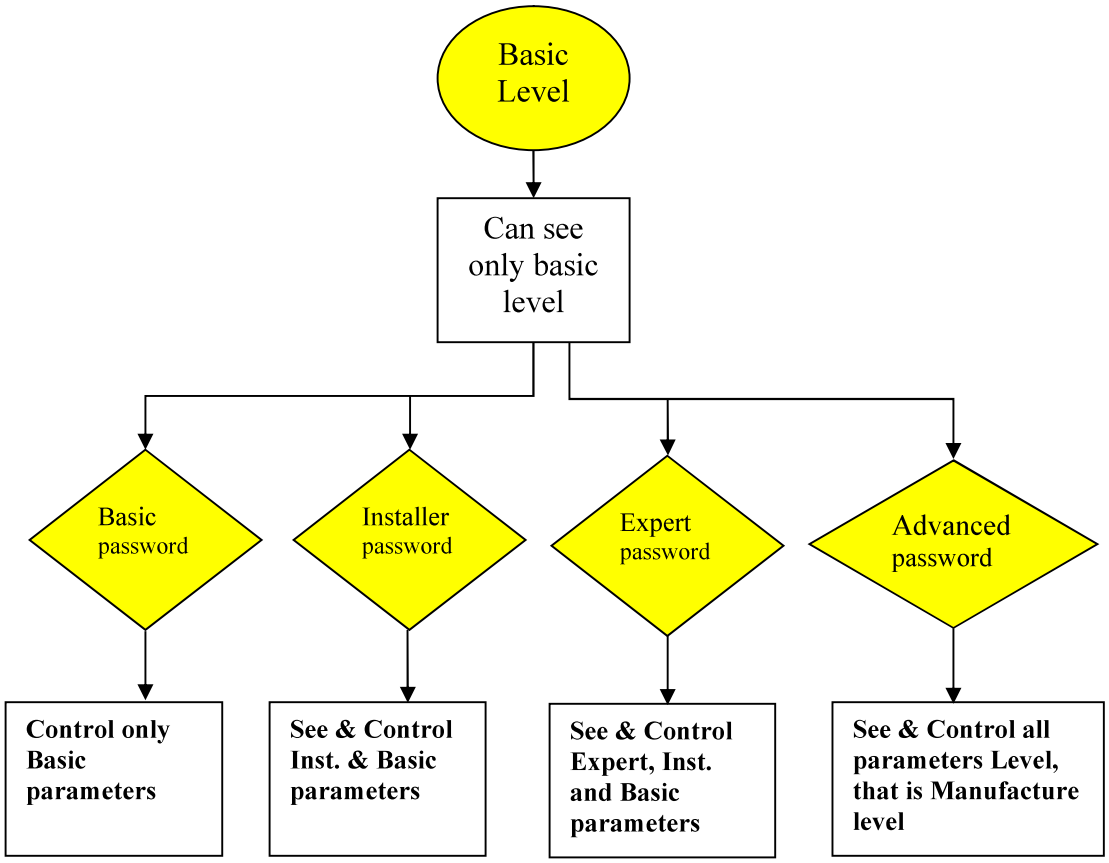
Parameters Mode:



- **Basic mode (B):** This user has the privilege to change basic parameters.
- **Installer mode (I):** This user has the privilege to change and view installer and basic parameters.
- **Expert mode (E) :** This user has the privilege to change and view expert, installer and basic parameters.
- **Advanced mode (A):** This user has the privilege to change and view advanced, expert, installer and basic parameters.

SUNTRACK Parameter Settings:

Mode	Parameters	Parameters Description	Unit	Default Values		Range
Basic Settings						
Basic	P001	Battery Voltage	Volt	Automatic		0:Automatic 12 Volt 24 Volt 36Volt 48 Volt 60 Volt
Basic	P002	Charger Device mode	---	Charger		Regulator / Charger
Expert	P003	Battery charging Current	Adc	50		0 → 100
Expert	P004	Battery Capacity	Ah	240		100 → 400
Expert	P005	Regulator Minimum Volt	Vac	**1xP001**		**1xP001 → 1.5xP001**
				If P001=12V	P005= 12V	12 → 18
				If P001=24V	P005= 24V	24 → 36
				If P001=36V	P005= 36V	36 → 54
				If P001=48V	P005= 48V	48 → 72
				If P001=60V	P005= 60V	60 → 90
Expert	P006	Regulator Maximum Volt	Vac	**1.3xP001**		**1.08xP001 → 1.5xP001**
				If P001=12V	P006=15.6V	12.96 → 18
				If P001=24V	P006=31.2V	25.92 → 36
				If P001=36V	P006=46.8V	38.88 → 54
				If P001=48V	P006=62.4V	51.84 → 72
				If P001=60V	P006=78V	64.8 → 90
Basic	P007	Restore Factory Settings	---	---		---
Expert	P008	Fall Back Voltage	Vdc	**1.08xP001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P008= 12.96V	9.48 →18
				If P001=24V	P008= 25.92V	18.96 →36
				If P001=36V	P008=38.88V	28.44 →54
				If P001=48V	P008= 51.84V	37.92 →72
				If P001=60V	P008= 64.8V	47.4 →90
Expert	P009	PC Communication	No/Yes	No		Min: No / Max: Yes
Expert	P010	MPPT Mode	No/Yes	Yes		Min: No / Max: Yes
Basic	P011	Truncate	No/Yes	No		Min: No / Max: Yes
Basic	P012	Battery Type	---	Tubular		Tubular AGM Lithium Gel Car battery
Absorption Phase						
Basic	P013	Absorption phase Enable	No/Yes	Yes		Min: No / Max: Yes
Basic	P014	Absorption Voltage	Vdc	**1.2xP001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P014=14.4V	9.48 →18
				If P001=24V	P014=28.8V	18.96 →36
				If P001=36V	P014=43.2V	28.44 →54
				If P001=48V	P014=57.6V	37.92 →72
				If P001=60V	P014=72V	47.4 →90
Expert	P015	Absorption duration	hours	2		1 →18
Expert	P016	End of absorption triggered by current	No/Yes	Yes		Min: No / Max: Yes
Expert	P017	Current limit to quit the absorption phase	Adc	5		4→ 200
Floating phase						
Expert	P020	Floating voltage	Vdc	**1.135xP001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P020=13.62	9.48 →18
				If P001=24V	P020=27.24	18.96 →36
				If P001=36V	P020=40.86	28.44 →54
				If P001=48V	P020=54.48	37.92 →72
				If P001=60V	P020=68.1	47.4 →90
Expert	P021	Force Phase of floating	---	none		None / Force
Expert	P022	Floating Duration before Floating A stage	hours	1		1 →720
Expert	P023	Enable Floating A stage	No/Yes	yes		Min: No / Max: Yes
Expert	P024	Floating A Current	Adc	3		1 → 20
Expert	P025	Floating A stage duration before reduced floating	hours	24		1 → 720

Mode	Parameters	Parameters Description	Unit	Default Values		Range
Floating phase						
Expert	P026	floating under volt to restart charging cycle*	Vdc	**1*P001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P026=12V	9.48 →18
				If P001=24V	P026=24V	18.96 →36
				If P001=36V	P026=36V	28.44 →54
				If P001=48V	P026=48V	37.92 →72
				If P001=60V	P026=60V	47.4 →90
Expert	P027	Floating over volt to restart charging cycle**	Vdc	**1.2*P001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P027=14.4V	9.48 →18
				If P001=24V	P027=28.8V	18.96 →36
				If P001=36V	P027=43.2V	28.44 →54
				If P001=48V	P027=57.6V	37.92 →72
				If P001=60V	P027=72V	47.4 →90
Expert	P028	floating volt limit to turn relay off	Vdc	**1.25*P001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P028=15V	9.48 →18
				If P001=24V	P028=30V	18.96 →36
				If P001=36V	P028=45V	28.44 →54
				If P001=48V	P028=60V	37.92 →72
				If P001=60V	P028=75V	47.4 →90
Reduce Floating Phase						
Expert	P030	Enable Reduced floating	No/Yes	Yes		Min: No Max: Yes
Expert	P031	Reduced floating voltage	Vdc	**1.1xP001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P031=13.2V	9.48 →18
				If P001=24V	P031=26.4V	18.96 →36
				If P001=36V	P031=39.6V	28.44 →54
				If P001=48V	P031=52.8V	37.92 →72
				If P001=60V	P031=66V	47.4 →90
Expert	P032	Reduced floating duration before Reduced floating A	hour	168		1 → 720
Expert	P033	Enable Reduce Floating A Stage		Yes		Min: No / Max: Yes
Expert	P034	Reduce Floating A stage Current	Adc	3		1 → 20
Expert	P035	Reduce Floating A stage duration before periodic Absorption	days	7		1 →30
Expert	P039	LCD Backlight Economy Mode	No/Yes	Yes		Min: No / Max: Yes
Periodic Absorption						
Expert	P040	Enable Periodic absorption	No/Yes	Yes		Min: No Max: Yes
Expert	P041	Periodic absorption voltage	Vdc	**1.2xP001**		**1.08xP001 → 1.5xP001**
				If P001=12V	P041=14.4V	12.96 →18
				If P001=24V	P041=28.8V	25.92 →36
				If P001=36V	P041=43.2V	38.88 →54
				If P001=48V	P041=57.6V	51.84 →72
				If P001=60V	P041=72V	64.8 →90
Expert	P042	Periodic absorption duration	Min	30		5 →600
Expert	P045	Night Mode	No/Yes	No		Min: No Max: Yes
Expert	P046	Start Night Mode	O'clock	17		0 → 23
Expert	P047	End Night Mode	O'clock	8		0 → 23
Equalization Phase						
Expert	P048	Continue to Equalization stage	---	No		Min: No Max: Yes
Expert	P049	Enable Equalization	No/Yes	Yes		Min: No Max: Yes
Basic	P050	Force Equalization		None		None / Force
Basic	P051	Equalize at absorption stage	After/ Before	After		After / Before
Expert	P052	Equalization current	Adc	10		0 → 50
Expert	P053	Equalization voltage	Vdc	31.20		13.02 → 36
Expert	P054	Equalization duration	Min	30		5 → 300
Expert	P055	Number of cycles before an equalization	---	50		0 → 100
Expert	P056	Equalization at fixed interval	No/Yes	No		Min: No / Max: Yes
Expert	P057	Weeks between equalizations	weeks	5		1 → 104

* P026 : In case Floating and there exists a big load that exceeds the battery charging current, so specify the battery under volt to restart the whole charging cycle because floating stage can't compensate to the lost voltage.

** P027: In case Floating and there exists an outside charger from Grid for example, that mixed up the charging stages. So specify a battery over volt to restart the charging cycle from Suntrack.

Mode	Parameters	Parameters Description	Unit	Default Values		Range
Equalization Phase						
Expert	P058	End of equalization triggered with current	No/Yes	No		Min: No Max: Yes
Expert	P059	Current limit to quit the equalization phase	Adc	10		4 → 30
Expert	P060	Equalization cycle voltage	Vdc	**0.93xP001**		**0.83xP001 → 1.5xP001**
				If P001=12V	P060=11.16V	9.96→18
				If P001=24V	P060=22.32V	19.92→36
				If P001=36V	P060=33.48V	29.88→54
				If P001=48V	P060=44.64V	39.84→72
				If P001=60V	P060=55.8V	49.8→90
Basic	P061	Equalization timeout	hours	2		2 → 10
General Settings						
Expert	P075	Temp shutdown	^ c	55		45 → 60
Expert	P076	Temp Fan hi	^ c	45		40 → 55
Expert	P077	Temp Fan Low	^ c	39		25 → 40
Expert	P078	Temp Hysteresis	^ c	3		1 → 10
Expert	P080	Bulk time out	hours	10		0 → 30
Basic	P081	Enable Buzzer	yes	Yes		Min: No Max: Yes
Basic	P082	Firmware Version	Version	Text		Version
Basic	P083	Hardware Version	Version	Text		Version
Expert	P084	Serial control	Yes/No	No		Min: No Max: Yes
Expert	P085	Maximum current	Adc	45		0 →100
Expert	P086	Minimum Current	Adc	35		0 → 100
Expert	P087	RMS Adjust	---	No		Min: No Max: Yes
Basic	P088	Extra power % to float	%	15		5 → 50
Expert	P089	Enable Watt Accumulator	No/Yes	No		Min: No / Max: Yes
Basic	P090	Enable of temperature compensation	Yes/No	No		Min: No / Max: Yes
Basic	P091	Temperature compensation	^c	3		3 → 10
Basic	P098	Enable buzzer	Yes/No	Yes		Min: No / Max: Yes
Communication Settings						
Basic	P100	Communication Charging Voltage	Vdc	**1.08xP001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P100=12.96V	9.48 →18
				If P001=24V	P100=25.92V	18.96 →36
				If P001=36V	P100=38.88V	28.44 →54
				If P001=48V	P100=51.84V	37.92 →72
				If P001=60V	P100=64.8V	47.4 →90
Basic	P101	Communication Charging Current	Adc	25		0 → 100
Basic	P102	MPPT Adjust	sec	10		5 → 300
Basic	P103	MPPT Steps	---	12		1 → 25
Date & Time						
Basic	P130	Time 12/24 o'clock	---	12		12/24
Basic	P131	Time	---	15:22		00:00 → 23:59
Basic	P132	Date	Day	8		1 → 31
Basic	P133	Month	Mon	12		1 → 12
Basic	P134	Year	Year	2021		0 → 99
Basic	P135	Display Date, time on LCD	Yes/no	Yes		Min: No / Max: Yes
Output Settings						
Basic	P140	Function 1 Charging Current	Adc	40		5 → 60
Basic	P141	Function 1 disable delay time	sec	10		2 → 120
Basic	P142	Function 2 charging stage	txt	Floating		Absorption / Floating
Basic	P143	Function 2 disable delay time	sec	10		2 → 120
Basic	P144	Function 3 Bus charging Current	Adc	40		5 → 60
Basic	P145	Function3 delay time when reach zero Current	sec	10		2 → 120
Basic	P160	Output 1	Yes/ No	Yes		Min: No Max: Yes
Basic	P161	Output 1 delay time	sec	5		0 → 60
Basic	P162	Output 1 Action 1	txt	1		0: No action 1: Function 1 P140 2: Function 2 P142 3: Function 3 P144 4: PV overvolt

Mode	Parameters	Parameters Description	Unit	Default Values	Range
Output Settings					
Basic	P163	Output 1 action 2	txt	0	0: No action 1: Function 1 P140 2: Function 2 P142 3: Function 3 P144 4: PV overvolt
Basic	P164	Output 1 ignore time	min	0	0: disable 1 → 180
Basic	P165	Output 2	Yes/ No	Yes	Min: No / Max: Yes
Basic	P166	Output 2 delay time	sec	0	0 → 60
Basic	P167	Output 2 Action 1	txt	4	0: No action 1: Function 1 P140 2: Function 2 P142 3: Function 3 P144 4: PV overvolt
Basic	P168	Output 2 Action 2	txt	0	0: No action 1: Function 1 P140 2: Function 2 P142 3: Function 3 P144 4: PV overvolt
Basic	P169	Output 2 Action start time	O'clock	6	0 → 23
Basic	P170	Output 2 Action end time	O'clock	19	0 → 23
Basic	P171	Output 2 ignore time	min	0	0: disable 1 →180
Advanced Settings					
Basic	P178	Enable Bus Combined Charging Current	Yes/ No	No	Min: No / Max: Yes
Basic	P179	Max. Bus Charging Current	Adc	60	60 →500
Installer	P900	Dummy mode	text	All mode	Min: All mode / Max: On mode
Expert	P901	PV over volt	volt	140	60 → 149
Basic	P902	Fan Auto Speed	Yes/ No	Yes	Min: No Max: Yes
Basic	P903	Fan Voltage	Volt	24	12 : 24
Basic	P904	Temp. Fan Speed 1	^	42	40 →44
Basic	P905	Temp. Fan Speed 2	^	45	42 →45
Basic	P906	Temp. High Speed	^	467	45 →50
Basic	P907	Fan On	Yes/ No	No	Min: No / Max: Yes
Basic	P910	Erase logs	---	S	S →S
Basic	P918	Turn Output ON	No		
Expert	P919	Software reset	Yes/ No	No	Min: No / Max: Yes
Expert	P920	PV boundary	Yes/ No	No	Min: No / Max: Yes
Expert	P921	Lower boundary	Volt	90	50 → 100
Expert	P922	Upper boundary	Volt	110	80 → 120
Installer	P925	Logs record time	min	6	1 → 15
Expert	P930	Battery reading volt	---	read	10.0 → 70.0
Expert	P940	Update Parameter	---	No	Min: No / Max: Yes
Basic	P950	Parameter Battery saving voltage	Volt	24	12 → 72
Expert	P965	LCD 4 lines	---	No	Min: No / Max: Yes
Basic	P970	First Unlock	Lock	Lock	Lock or Unlock
Basic	P971	Second Unlock	Lock	Unlock	Lock or Unlock
Basic	P997	Basic password	---	0000	---
Installer	P998	Installer Password	---	1111	---
Expert	P999	Expert Password	---	---	---

Note: Technical Parameters are subjected to change due to continuous improvements and R&D

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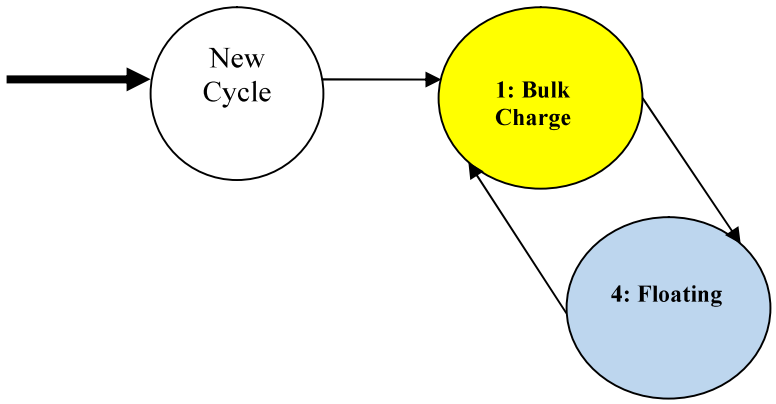
Most Commonly Used Parameters

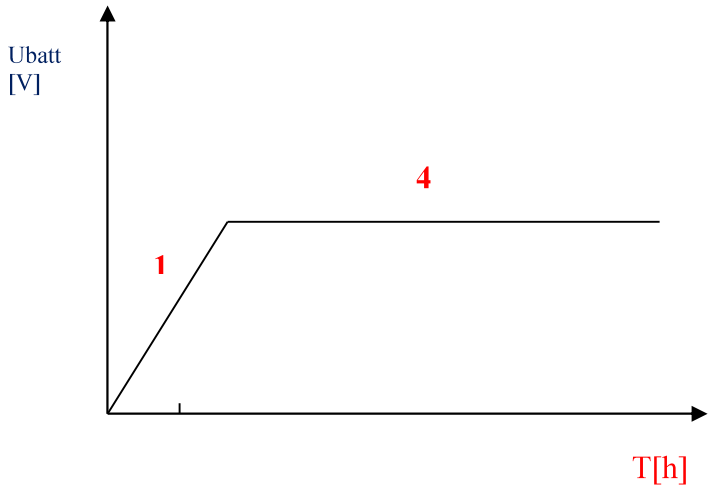
Mode	Parameters	Parameters Description	Unit	Default Values		Range
Basic Settings						
Basic	P001	Battery Voltage	Volt	Automatic		0:Automatic 12 Volt 24 Volt 36Volt 48 Volt 60 Volt
Basic	P002	Charger Device mode	---	Charger		Regulator / Charger
Expert	P003	Battery charging Current	Adc	50		0 → 100
Expert	P004	Battery Capacity	Ah	240		100 → 400
Basic	P012	Battery Type	---	Tubular		Gel/ Deep cycle/Car battery/AGM/Tubular/Lithium
Absorption Phase						
Basic	P013	Absorption phase Enable	No/Yes	Yes		Min: No / Max: Yes
Basic	P014	Absorption Voltage	Vdc	**1.2xP001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P014=14.4V	9.48 →18
				If P001=24V	P014=28.8V	18.96 →36
				If P001=36V	P014=43.2V	28.44 →54
				If P001=48V	P014=57.6V	37.92 →72
				If P001=60V	P014=72V	47.4 →90
Expert	P015	Absorption duration	hours	2		1 →18
Expert	P016	End of absorption triggered by current	No/Yes	Yes		Min: No / Max: Yes
Expert	P017	Current limit to quit the absorption phase	Adc	5		4→ 200
Floating phase						
Expert	P020	Floating voltage	Vdc	**1.135xP001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P020=13.62	9.48 →18
				If P001=24V	P020=27.24	18.96 →36
				If P001=36V	P020=40.86	28.44 →54
				If P001=48V	P020=54.48	37.92 →72
				If P001=60V	P020=68.1	47.4 →90
Expert	P021	Force Phase of floating	---	none		None / Force
Expert	P026	floating under volt to restart charging cycle*	Vdc	**1*P001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P026=12V	9.48 →18
				If P001=24V	P026=24V	18.96 →36
				If P001=36V	P026=36V	28.44 →54
				If P001=48V	P026=48V	37.92 →72
				If P001=60V	P026=60V	47.4 →90
Expert	P027	Floating over volt to restart charging cycle**	Vdc	**1.2*P001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P027=14.4V	9.48 →18
				If P001=24V	P027=28.8V	18.96 →36
				If P001=36V	P027=43.2V	28.44 →54
				If P001=48V	P027=57.6V	37.92 →72
				If P001=60V	P027=72V	47.4 →90
Expert	P028	floating volt limit to turn relay off	Vdc	**1.25*P001**		**0.79xP001 → 1.5xP001**
				If P001=12V	P028=15V	9.48 →18
				If P001=24V	P028=30V	18.96 →36
				If P001=36V	P028=45V	28.44 →54
				If P001=48V	P028=60V	37.92 →72
				If P001=60V	P028=75V	47.4 →90
Periodic Absorption						
Expert	P045	Night Mode	No/Yes	No		Min: No Max: Yes
Expert	P046	Start Night Mode	O'clock	17		0 → 23
Expert	P047	End Night Mode	O'clock	8		0 → 23
Advanced Settings						
Expert	P920	PV boundary	Yes/No	No		Min: No / Max: Yes
Expert	P921	Lower boundary	Volt	90		50 → 100
Expert	P922	Upper boundary	Volt	110		80 → 120

Charging Sequence:

1. Minimum Battery Cycle:



The bulk charge and floating phase can't be deactivated. If the conditions for starting a new battery charge cycle have come together, the bulk charge phase starts immediately.



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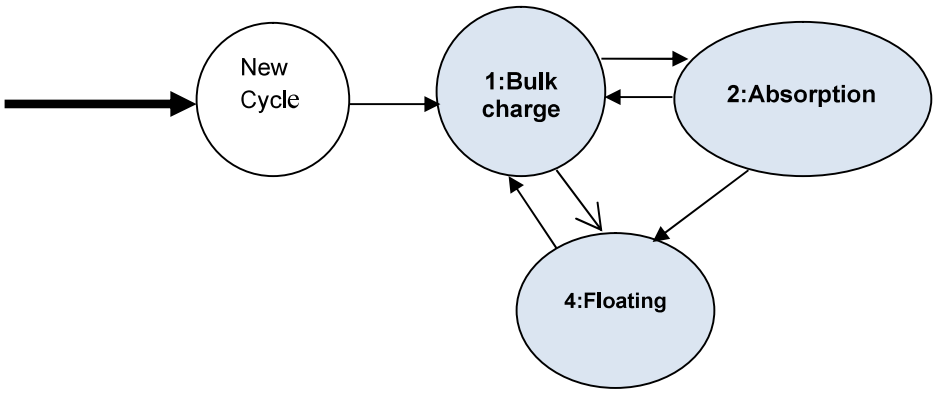
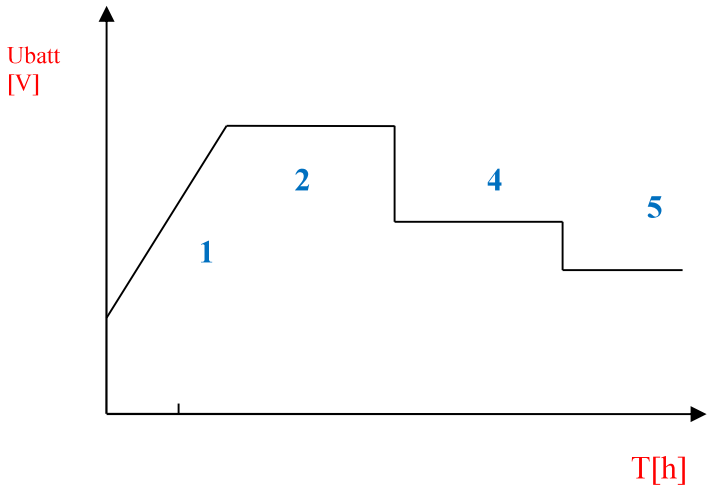
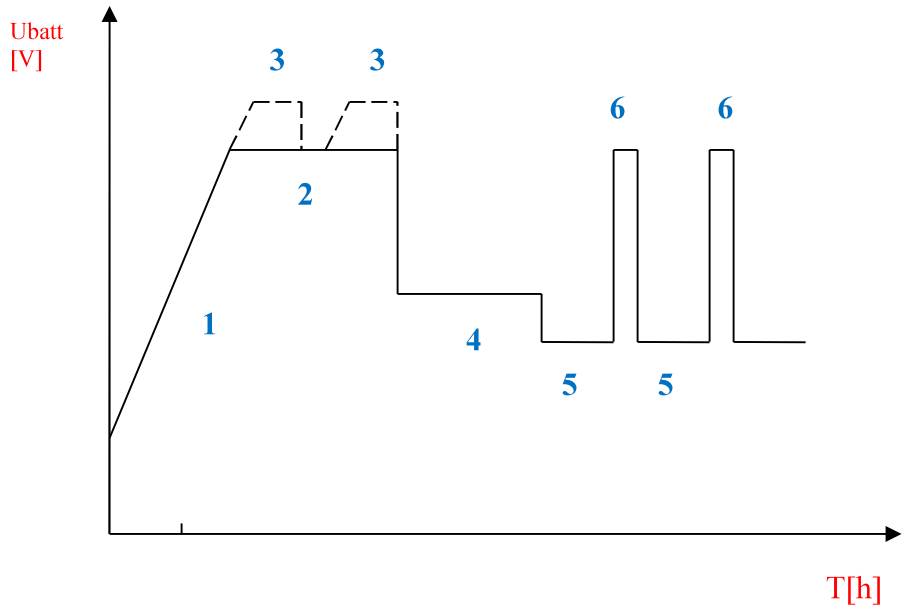
2. Default Battery Cycle





1 : Bulk charge.
2 : Absorption stage.
4 : Floating.
5 : Reduced Floating

3. Complete Battery Cycle:



1 : Bulk charge.
2 : Absorption stage.
3 : Equalization stage
4 : Floating.
5 : Reduced Floating
6 : Periodical Absorption

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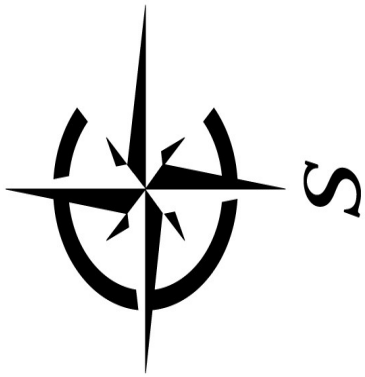
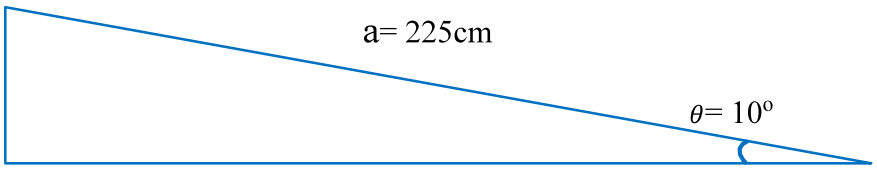
Solar panels Measurements



10 º inclination

Height(h)



$\sin(10^o) = 0.17364$ $\sin(\theta) = \frac{h}{a}$ $h = \sin(\theta) \times a$

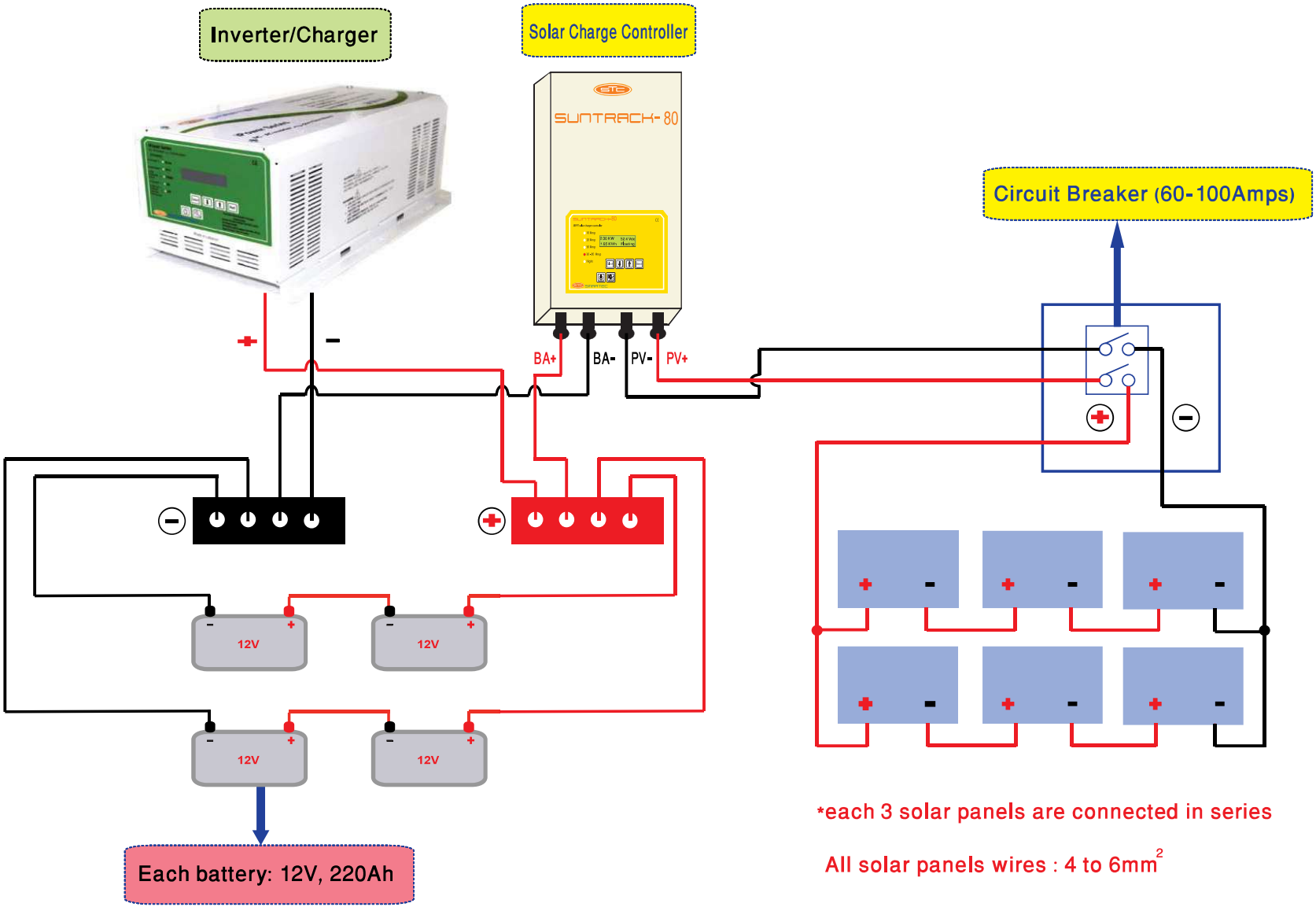
Number of panels	a (cm)	h (cm)
1	225	39
2	450	78
3	675	117
4	900	156
5	1125	195
6	1350	234
7	1575	274
8	1800	313
9	2025	352
10	2250	391

Inclination angle for solar panels:

- In summer :11º facing south
- In spring & Fall :34º facing south
- In Winter :54º facing south
- Average Inclination angle for all seasons: 20 º

SMARTEC Technologies

PV System Installation for 150Voc (10Amps)



Each 2 Batteries are connected in Series

Batteries wires: 35mm^2

*each 3 solar panels are connected in series

All solar panels wires : 4 to 6mm^2

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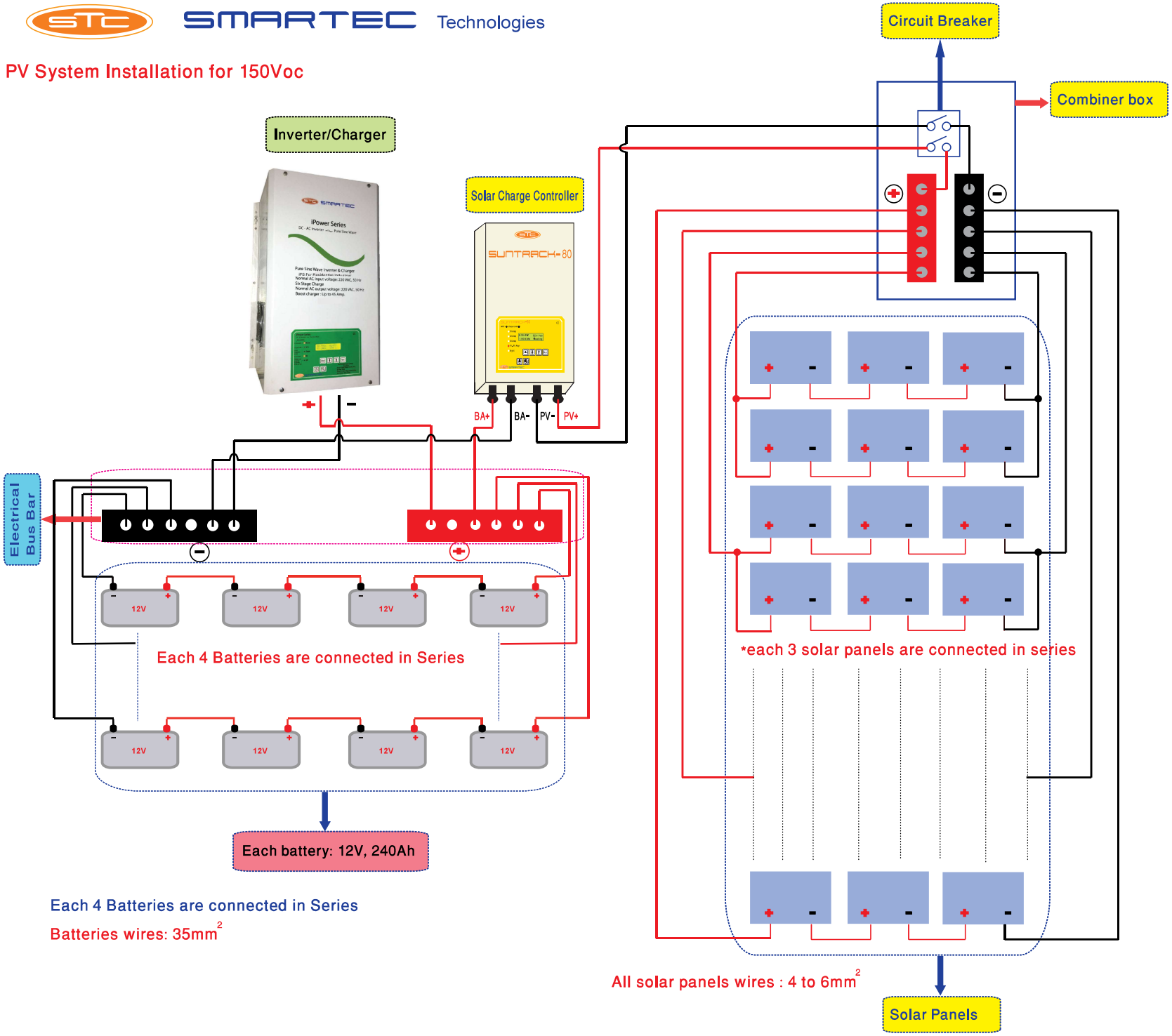
SMARTEC Technologies

PV System Installation for 150Voc



Each 4 Batteries are connected in Series

Batteries wires: 35mm^2

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