Manuals+ — User Manuals Simplified.

SPARKEL 2075 Series Smart-MPPT Series MPPT Solar Charge Controller User Manual

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SPARKEL 2075 Series Smart-MPPT Series MPPT Solar Charge Controller

Dear Clients

Thanks for selecting the Smart-MPPT series solar controller. Please take the time to familiarise yourself with this user manual, as it will help you take full advantage of the controller's features. This manual gives important recommendations for installing, using, and programming the solar controller Read this manual in ful before installing or connecting the solar controller.

Functions

Smart-MPPT series intelligent MPPT solar controller is programmable, waterproof and well-suited for a wide range of solar systems. The charging efficiency of this controller is higher than a traditional PWM controller, helping to get the most out of the solar panel.

It comes with a number of outstanding features, such as:

Innovative Maximum Power Point Tracking(MPPT) technology, tracking efficiency >99.9% High charge conversion efficiency up to 97.5% Adjustable 5-stage timer for load ouput Monitoring of the running status and parameters Suitable for Gel, Liquid, AGM and Lithium battery Four stage charging: MPPT, boost, equalization, float 0°C Charging Protection(Lithium) When BMS power off because of LVD, it can activate the system automatically Day/Night threshold can adjust automatically Configurable with an LCD remote programmer (S-Unit) Waterproof IP67, Strong and durable aluminum case Full automatic electronic protect function

Safety Instructions and Liability Waiver

Safety

1. the solar charge controller may only be used in PV systems in accordance with this user manual and with solar
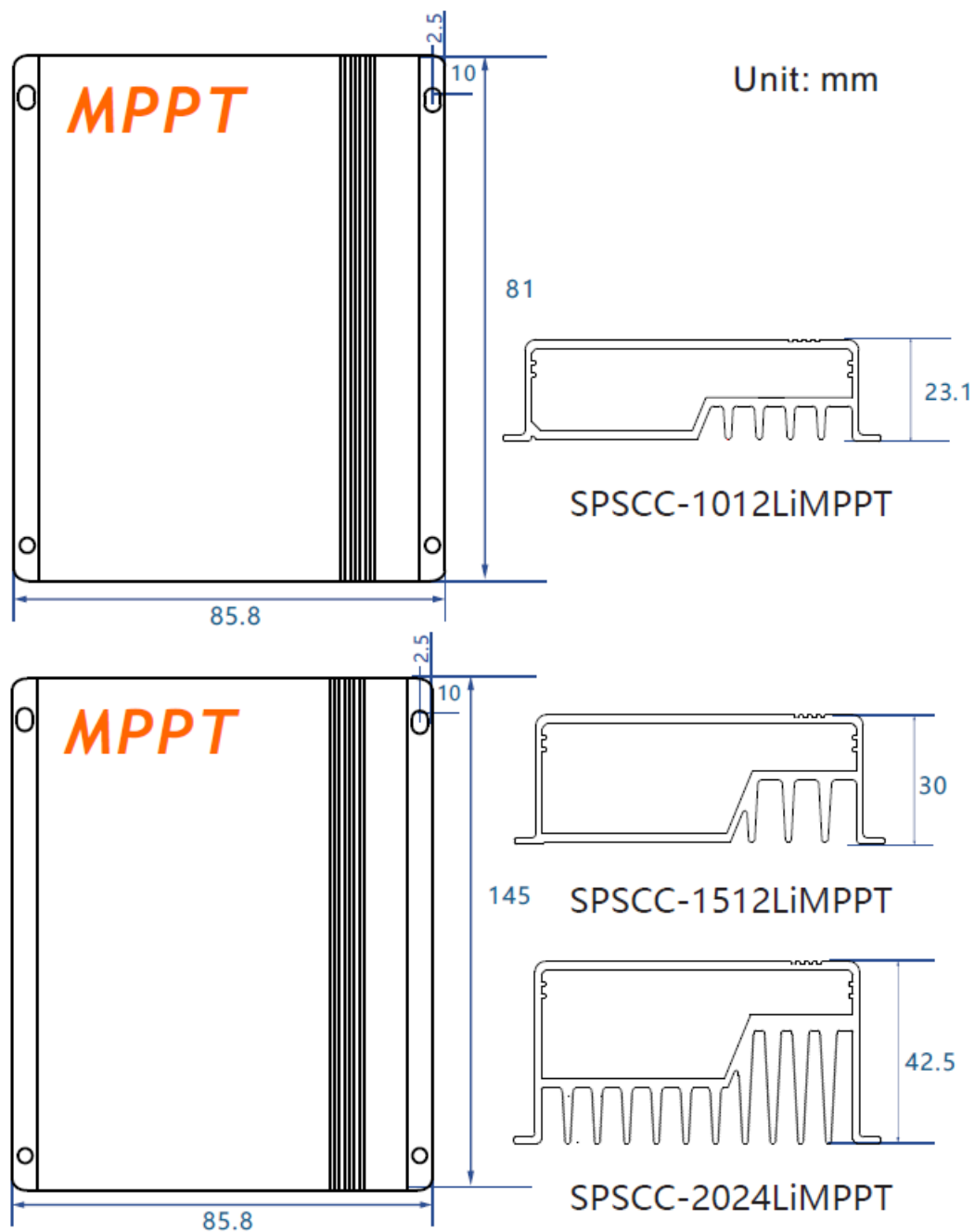
panel specifications in line with the requirements of this controller. No energy source other than solar panels may be connected to the solar charge controller Batteries store a large amount of energy, never short-circuit a battery under any circumstances.

2. We strongly recommend connecting an in-line fuse or circuit-breaker on the "+" wire between the battery and controller, no more than 15cm from the battery terminal.
3. Batteries can produce flammable gases. Avoid sparks and flames near the batteries. Make sure the battery is installed in a well-ventilated area.
4. Avoid touching or short-circuiting wires or terminals. Be aware that the voltages on special terminals or wires can be several times greater than the battery voltage. Use isolated tools and only perform any work in a dry environment.
5. Keep children away from batteries and the charge controller.

Liability Exclusion

- The manufacturer shall not be liable for damages to the controller or battery caused by use other than as instructed in this manual, or if the battery manufacturer's recommendations are neglected.
- The manufacturer shall not be liable if there has been service or repair carried out by any unauthorized person, unusual use, incorrect setup, or bad system design.

Dimensions

MPPT

2.5
10

Unit: mm

81

85.8

23.1

SPSCC-1012LiMPPT

MPPT

2.5
10

145

85.8

30

SPSCC-1512LiMPPT

42.5

SPSCC-2024LiMPPT

Installation

The following diagram provides an overview of the terminals. Please make sure to follow the proper order of connection.
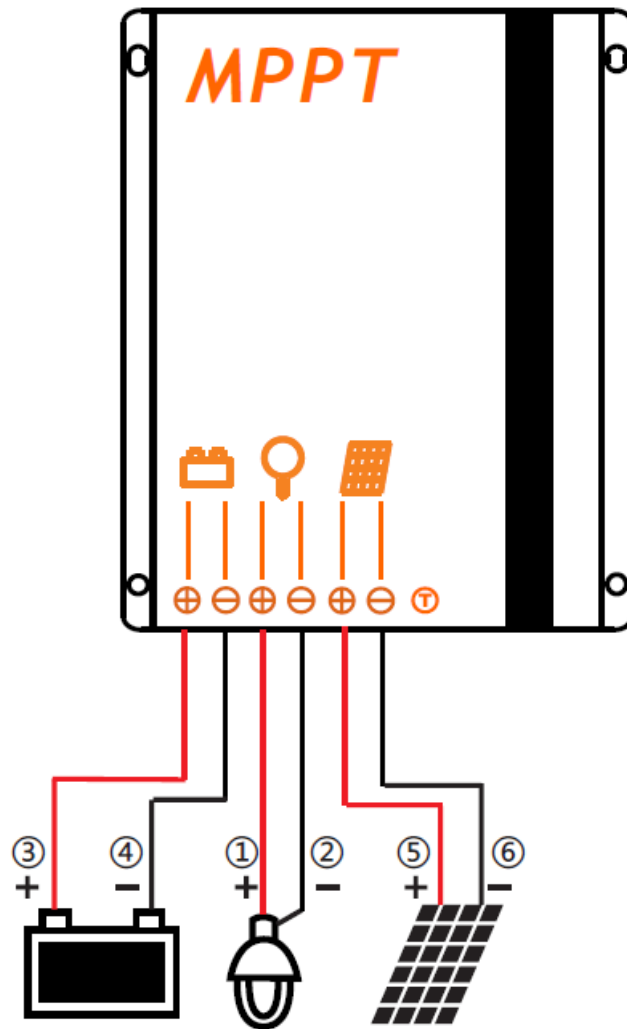
1. As the chart, Connect the load first with corresponding red(positive) and black (negative) cables, then seal them with tape.
2. Connect the battery with corresponding positive and negative cables, load will be on.
3. Connect panel with the corresponding red(positive) and black(negative) cables, the controller begins charging.
4. Confirm the LED display status, please refer to the
    - Faults and Alarms to identify the reason.
    - Make sure the wire length between battery and controller is as short as possible.
    - **Recommended Wire size:** 10A:2.5mm2 15/20A: 4mm2.

Remote control, Default settings

Settings can be changed using the "S-Unit" infrared remote programmer. For detailed instructions and settings, please see the S-Unit programmer remote manual. Be sure to only set one controller at a time.
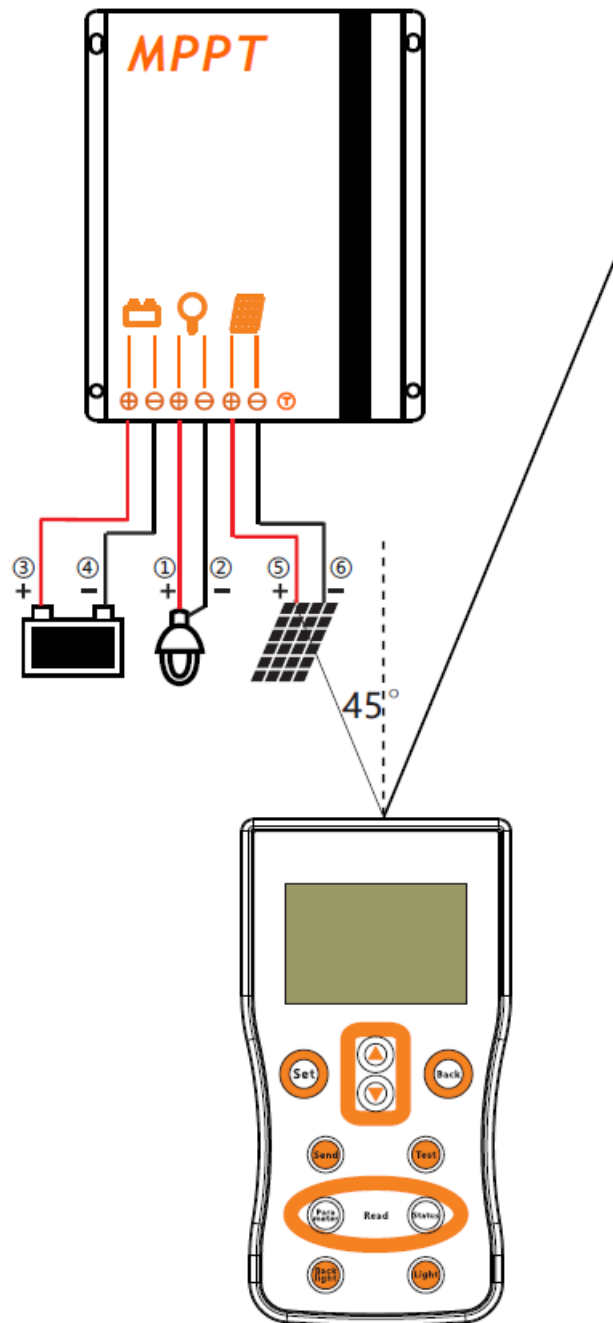
Reading the parameters

Press the "Parameter" key of the S-Unit to read the setting parameters of the controller

Num	Name	Factory Default
1	Time1	24H
2	Dim1	100%
3	Time2	0H
4	Dim2	100%
5	Time3	0H
6	Dim3	100%
7	Time4	0H
8	Dim4	0%
9	Time5	0H
10	Dim5	100%
11	D/N Thr	5.0V
12	D/N Dly	0min
13	Load I	0.3A
14	Dim Auto	No
15	Battery	Gel
16	LVD	11.0V
17	LVR	12.8V

Dimming function, if you set 0%, the load will be off, otherwise, the load will be on."Load I" and "Dim Auto" settings are for DC series controllers with built-in LED driver, and do not work in this type of controller

Reading the running status

Press the "Status" key of the S-Unit to read the running status of the controller. This will display the current mode of the controller and any measured values

Num	Name	Name describe	Unit
	Status	Charge	
1	Batt V	Battery voltage	V
2	Load I	Load current	A
3	Load V	Load voltage	V
4	PV V	PV voltage	V
5	PV I	PV current	A
6	Energy	Total generating capacity	AH
7	OD Times	Over-discharge times	Times
8	FC Times	Fully charge times	Times
9	Day1-HV	A day ago highest voltage	V
10	Day1-LV	A day ago lowest voltage	V
11	Day2-HV	Two days ago highest voltage	V
12	Day2-LV	Two days ago lowest voltage	V
13	Day3-HV	Three days ago highest voltage	V
14	Day3-LV	Three days ago lowest voltage	V

Press the "Test" key of S-Unit, the controller will turn on the load for 30s. During the daytime, this can verify correct installation and help with troubleshooting. In default "24H" mode, the test key is invalid.

Starting up the controller

- **Self Test**

As soon as the controller is powered, it starts a self-test routine. After this, the LED display will change to normal operation.

- **System Voltage**

The controller applies to Lithium, AGM, Liquid and Gel battery, the factory default setting is suitable for Gel batteries. It is your responsibility to check and ensure that these settings are correct for your battery, otherwise, they must be amended. When the controller is set to a Lithium battery, the charging target voltage and charging recovery voltage can be set according to customer requirements. The controller adjusts itself automatically to 12V or 24V system voltage when it is set to Gel, Liquid or AGM battery. If the battery voltage on start-up is 10V-15V then the controller infers a 12V system. If the battery voltage is 20V-30V the controller infers a 24V system.If the battery voltage is not within the normal operating range (ca.10 to 15V or ca.20 to 30V) at start-up, please refer to **9.2 Faults & Alarms**.

0℃ Charging Protection(Lithium Battery)

"0℃ Chg" can be set to "Yes", "Slow" or "No". When the controller detects that the ambient temperature is higher than 0℃, the charging function is normal. when the ambient temperature is low than 0℃, if the "0℃ Chg" is set to

"Yes", the charging function is normal, else if the "0°C Chg" is set to "slow", the max charging current is 20% of the rated current, else if the "0°C Chg" is set to "No", the controller does not charge the battery
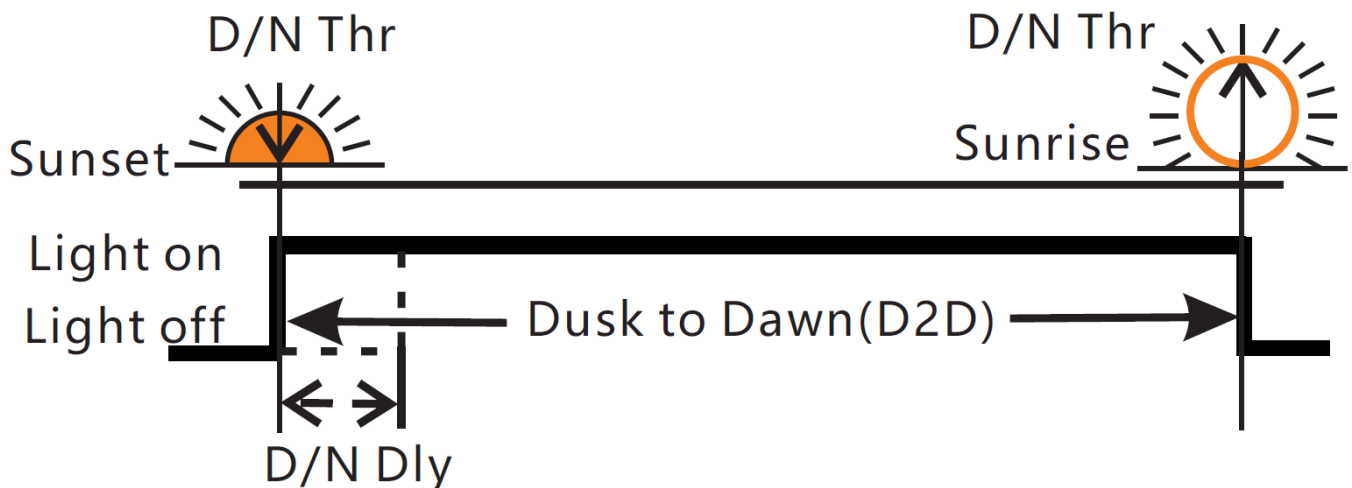
Load Output Timer Modes

Smart-MPPT series controller has advanced day/night time control functions. The modes of lighting can be based on customer needs.

Standard(24H)

If "Time1" is set to "24H" and sent to the controller successfully, the controller's load will always be on.
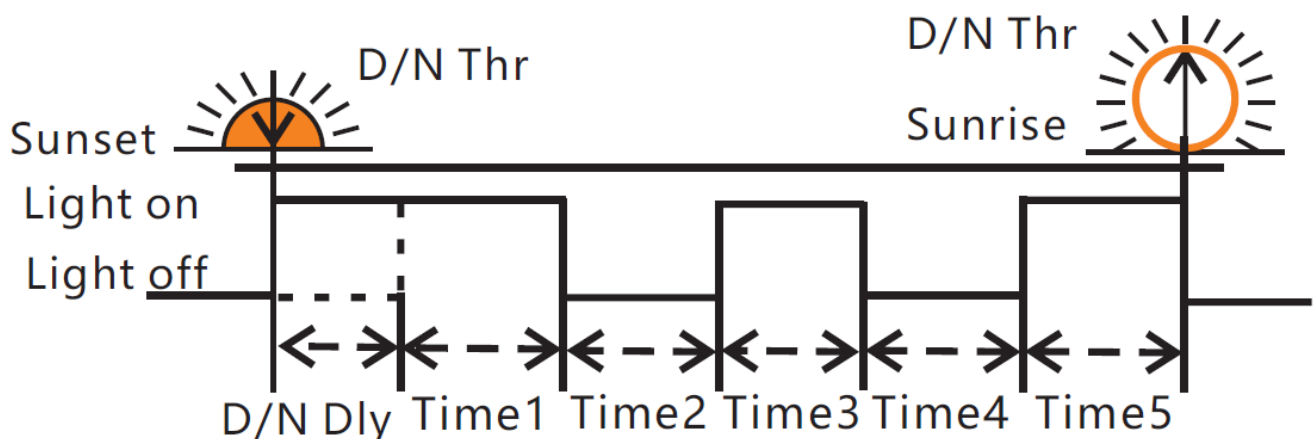
Dusk to Dawn (D2D)

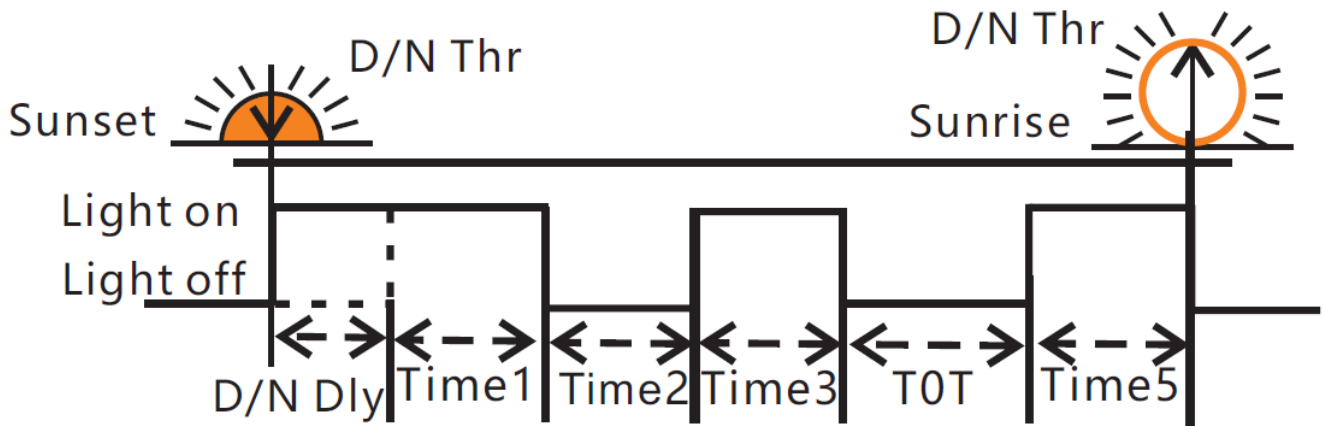If "Time1" is set to "D2D", the controller works in dusk to dawn mode.

1. The dimming setting will still be active in this mode.
2. If "Time1" is set to D2D mode, "Time4" cannot be set to T0T mode

Five-stage Night Mode

Time 1-5 and Dim 1-5 can be set individually to give variable load power throughout the night.

T0T mode(can set the load on time before dawn)

If "Time4" is set to "T0T", this mode is T0T mode. If "Time4" is set to "T0T" then the controller will determine Time4 based on Time5 and previous data on the time of sunrise. While "Time4" is set to T0T mode, "Time1" cannot set to D2D mode

LVD, LVR, Threshold

Low Voltage Disconnect (LVD)

When the battery voltage drops below the LVD voltage, the controller will disconnect the load to prevent deep discharge of the battery this occurs, the battery should be well charged before resuming use.

Gel, Liquid, and AGM Battery

- **Battery capacity control SOC1:**
    - 11.0-11.6V/22.0-23.2 V
    - sOC2: 11.1-11.7V/22.2-23.4 V
    - SOC3: 11.2-11.8V/22.4-23.6 V
    - SOC4: 11.4-11.9V/22.8–23.8 V
   - SOCS: 11.6-12.0V/23.2-24.0 V
- **Battery voltage contro LVD range:**
    - 10.8-11.8V/21.6-23.6V. 2.
- **Lithium Battery LVD range:** 9.0-30.0V. 8.2
- **Low Voltage Reconnect (LVR)** If the low voltage disconnect is triggered, the controller will restore load connection only when the battery voltage increases above the LVR voltage. 1. Gel, Liquid and AGM Battery LVR range: 11.4-12.8V/224-25.6. 2.
- **Lithium Battery LVR range:** 9.6-31.0V. 8.3 Day/Night Threshold, Day/Night Delay The controller recognizes day and night based on the solar array open circuit voltage. This day/night threshold can be modified according to local light conditions and the solar array used. Day/Night threshold setting range: 3.0-20.0V. The actual time of turning on can be delayed by up to 30 minutes from the time the threshold was reached using the Day/Night delay setting (D/N Dly).Day/Night delay time setting range: 0~30min
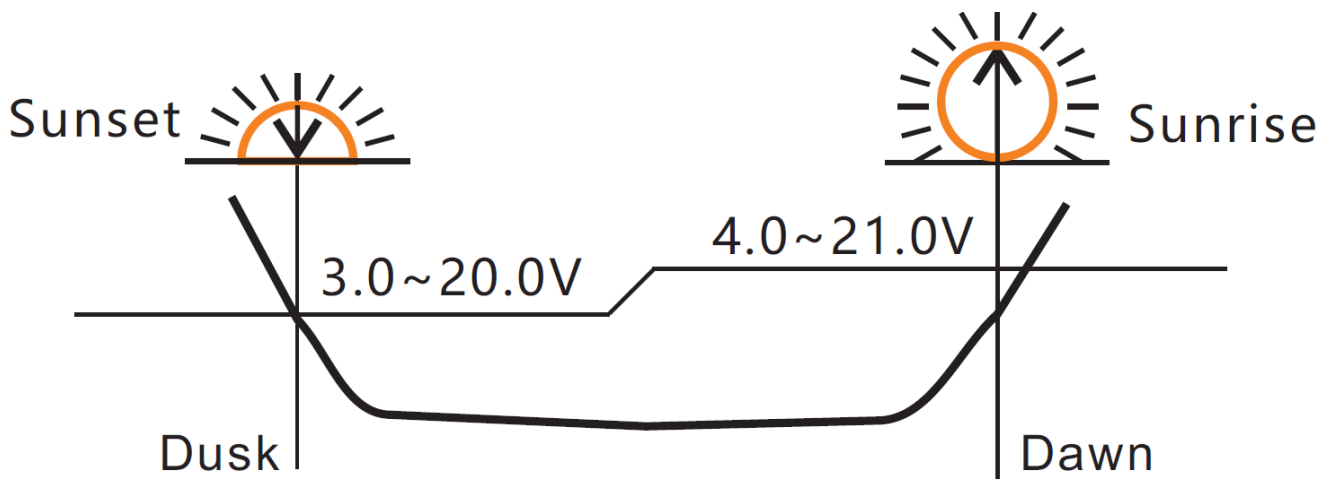
Day/Night threshold voltage of load disconnect is 1V higher than the setting data, which means the load will disconnect when the solar voltage at 4.0~21.0V.Day/Night threshold voltage of load disconnect is 1V higher than the setting data, which means the load will disconnect when the solar voltage at 4.0-21.0OV. The controller will automatically adjust the day/night threshold. If the lowest solar voltage is higher than the day/night threshold. The load will have no output the first night, then 24 hours later the controller will automatically adjust the setting to give output the following night

LED indicators, Faults & Alarms
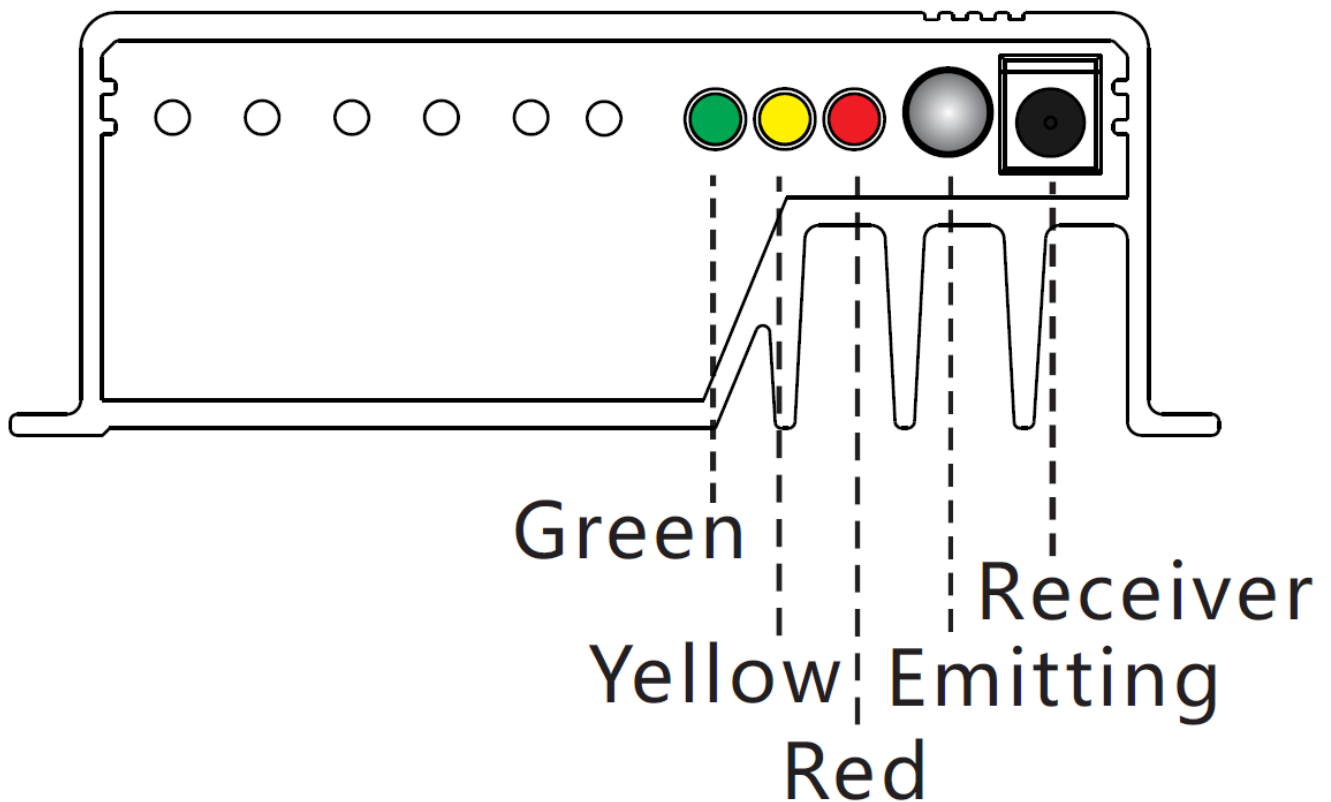
Detailed fault information can be read by S-Unit remote controller.

Fault	Status	Reason	Remedy
Loads are not powered	Low volt. protection	Low Battery capacity	Recharge battery above LVR.
	Overcurrent, short circuit protection	Overload or load short-circuit	Switch off all loads, remove short-circuit, the load will be reconnected after 1 minute.
	Over temp. protection	Controller temp. is too high	The controller will turn the system off until the temperature is below 60 ° C.
High voltage at the battery terminal	Overvoltage protection	Battery overvoltage >15.5V/31V (Li: CVT+0.2V)	Check if other sources overcharge the battery. If not, the controller is damaged.
		Battery wires or battery fuse damaged, the battery has high resistance.	Check battery wires, fuse, and battery.
Incorrect system voltage	All LED fast flashing	Battery voltage is not in the right range	Charge or discharge the battery to correct the voltage
The battery is empty after a short time	Low voltage protection	The battery has low capacity	Change battery
Battery not charging	Green LED is on	PV panel fault or reverse connection	Check panels and wire connections

Safety Features

	Solar terminal	Battery terminal	Load terminal
Reverse polarity	Protected [1]	Protected	Protected [1]
Short circuit	Protected	Protected [2]	Switches off immediately
Over current			Switches off with delay
Reverse Current	Protected		
Over voltage	Max.55V [3]	Max. 35V [4]	
Under voltage			Switches off
Over temp.	The controller cuts off the load if the temperature reaches the set value.		

1. A controller can protect itself, but load might be damaged.
2. Battery must be protected by fuse.
3. Please refer to "11. Technical Data" to get the max voltage of PV panel.
4. Please refer to "11. Technical Data" to get the max voltage of the battery.

Warning: The combination of different error conditions may cause damage to the controller. Always remove the error before you continue connecting the controller

Technical Data

	Item	SPSCC-1012LiMPPT	SPSCC-1512LiMPPT	SPSCC-2024LiMPPT
	Max Charging Current	10A	15A	20A
	System Voltage	12V	12V/24V automatical recognization	
	MPPT Charging Voltage	<14.5V@25℃	<14.5/29V@25℃	
	Boost Voltage	14.5V @25℃	14.5/29V @25℃	
	Equalization Voltage	14.8V @25℃	14.8/29.6V @25℃ Liquid, AGM	
	Float Voltage	13.7V @25℃	13.7/27.4V @25℃	

Battery Parame- ters	Low Volt. Disconnect	10.8~11.8V,SOC1~5	10.8~11.8V/21.6~23.6V; SOC1~5(Default: 11.2/22.4V	
	Reconnect Voltage	11.4~12.8V	11.4~12.8V/22.8~25.6V(Default: 12.0/24.0V	
	Overcharge Protect	15.5V	15.5/31.0V	
	Temp. Compensation	-4.17mV/K per cell (Boost, Equalization) -3.33mV/K per cell (Float)		
	Charging voltage target	10.0~17.0V	10.0~32.0V(Lithium, Programmable	
	Charging voltage recovery	9.2~16.8V	9.2~31.8V(Lithium, Programmable	
	Low voltage disconnect	9.0~15.0V	9.0~30.0V(Lithium, Programmable	
	Low voltage reconnect	9.6~16.0V	9.6~31.0V(Lithium, Programmable	
	Battery Type	Lithium, Liquid, Gel, AGM Programmable, default: Gel		
	0℃ Charge Protection	Yes, No, Slow(Lithium, default: Yes)		
	Max input power	130W	200W/400W	260W/520W
	Max volt on Bat. Terminal	25V	35V	
Panel Parame- ters	Max volt on PV terminal	45V	55V **1**	
	Dusk/Dawn detect volt.	3.0~8.0V	3.0~20.0V(Programmable	
	Day/Night delay time	0~30Min(Programmable		
	MPPT tracking range	Battery Voltage + 1.0V ~Voc*0.9 **2**		
	Max tracking efficiency	>99.9%		
Load	Output Current	10A	15A	20A
System Parame- ters	Max charge conversion	96.5%	97.5%	
	Self consumption	6mA		
	Dimensions	85.8 * 81 *23.1mm	85.8 * 145 * 30mm	85.8 * 145 * 42.5mm
	Weight	260g	600g	720g
	Ambient temperature	-35~+60℃		
	Ambient humidity	0~100%RH		
	Protection degree	IP67		
	Max Altitude	4000m		

1. PV panel Voc can not exceed this value, otherwise, it will damage the controller.
2. Voc means the open-circuit voltage of the solar panel.

Documents / Resources

SPARKEL 2075 Series Smart-MPPT Series MPPT Solar Charge Controller [pdf] User Manual
2075 Series Smart-MPPT Series MPPT Solar Charge Controller, 2075 Series, Smart-MPPT Series, MPPT Solar Charge Controller

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