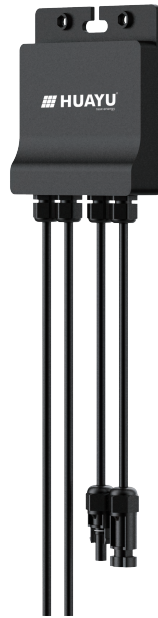


# Installation and Operation Manual

## Rapid Shutdown

- HY-RSD-1
- HY-RSD-2
- HY-RSD-3
- HY-RSD-4



***For our home energy independence.***

# Contents

---

Company Profile .....	01
<b>1. Introduction .....</b>	<b>01</b>
1.1 Prefix .....	01
1.2 Standards Compliance .....	01
1.3 How to Use This Manual .....	01
1.4 Label .....	01
<b>2. Safety Instruction .....</b>	<b>02</b>
<b>3. FCC Compliance .....</b>	<b>03</b>
<b>4. Installation .....</b>	<b>03</b>
4.1 Attach HY-RSD to the Racking .....	03
4.2 Frame Mount Diagram .....	03
4.3 HY-RSD System Diagram .....	04
<b>5. Operating Instructions .....</b>	<b>05</b>
<b>6. PV Panel Monitoring Using HY-MDL .....</b>	<b>06</b>
<b>7. Specification .....</b>	<b>06</b>
<b>8. Models and Marking .....</b>	<b>08</b>
8.1 PV Connector Options .....	08
8.2 HY-RSD-1-xy .....	08
8.3 HY-RSD-2-P-xy .....	08
8.4 HY-RSD-2-L-xy .....	08
<b>9. System Mark .....</b>	<b>09</b>

# Company Profile

Huayu New Energy is dedicated to be a world's leading "Safe & Smart Solar Energy" supplier for homeowners.

"For our home energy independence" is a vision deserved for all people who truly trust clean energy is the future for our children, whatever you're from rich families or low-income families.

Since the establishment of Huayu New Energy, we specialize in R&D of Safe Module-Level Solar Solution and Smart Energy Storage Solution which are controlled by Huayu Portal Management Platform with over 10 languages, these innovative technologies are developed to configure a Smart Distributed Solar System with bidirectional flow of energy which no doubt is the basic infrastructure of our future Energy Internet.

Featured with "Renewable, Distributed, Interconnected, Open & Intelligent", Energy Internet is a must for human beings in 21st century to realize a de-monopolistic & de-centralized sustainable power supply system across the globe. Huayu New Energy was born to be the leader of "Safe & Smart" distributed energy solution and play an irreplaceable role for the most exciting renewable energy revolution in human history.

Till today, we have delivered thousands of Huayu microinverters(300-2000W)and Huayu storage inverters(3-12kW)for global families and small businesses in Europe, North America, LATAM, South East Asia, Middle East and Africa.

Together with us, to be a part of game changer for "Safe & Smart Energy" via "Honesty, Trust, Teamwork & Sharing".

## 1. Introduction

### 1.1 Prefix

Thank you for choosing the HY-RSD rapid shutdown from Huayu. We hope our products will meet your need for renewable energy. Meantime, we appreciate your feedback regarding our products.

### 1.2 Standards Compliance

HY-RSD rapid shutdown devices comply with the NEC 2014 and NEC 2017 article 690.12, and CEC 2015 section 64-218.

### 1.3 How to Use This Manual







This manual provides detailed product information and installation instructions for the HY-RSD rapid shutdown. Please read through this manual before installation and operation.

#### WARNING

This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.

### 1.4 Label

Label is located on the side of the inverter. The information on the label includes technical data as well as type and serial number of the device. Safety instructions are listed and explained below:

	<b>Danger!</b> The term "danger" describes an issue which, if ignored can cause personal injury.
	<b>Attention!</b> With the term "attention" a circumstance is listed which may cause property damage if disregarded.
	<b>Instructions for use!</b> Under "Instructions for Use", it is pointed out that installation and operating instructions are to be read and understood before installation or repair.
	<b>Caution, hot surface!</b> Under "Caution, hot surface", it should be noted that surfaces of equipment may be hot and create a burn hazard.
	<b>Special disposal instructions!</b> With "Note Separate Disposal", it is pointed out that this product may not be disposed of with normal garbage. An improperly conducted disposal can lead to damage to the environment.
	<b>CE mark</b> The product complies with essential requirements of relevant directives of EU

## 2. Safety Instruction

### WARNING

PLEASE READ THIS MANUAL BEFORE INSTALLATION. ANY DAMAGE TO THE PRODUCT DUE TO NOT FOLLOWING THIS MANUAL IS NOT COVERED BY THE WARRANTY.

ALL THE INSTALLATION SHOULD BE DONE BY CERTIFIED ELECTRICIAN.  
BESIDES THE CABLE CONNECTORS, NOTHING INSIDE THE PRODUCT SHOULD BE MODIFIED.

ALL INSTALLATION SHOULD FOLLOW THE LOCAL ELECTRIC CODES. THIS PHOTOVOLTAIC RAPID SHUTDOWN EQUIPMENT (PVRSE) DOES NOT PERFORM ALL OF THE FUNCTIONS OF A COMPLETE PHOTOVOLTAIC RAPID SHUTDOWN SYSTEM (PVRSS). THIS PVRSE MUST BE INSTALLED WITH OTHER EQUIPMENT TO FORM A COMPLETE PVRSS THAT MEETS THE REQUIREMENTS OF NEC (NFPA 70) SECTION 690.12 FOR CONTROLLED CONDUCTORS OUTSIDE THE ARRAY. OTHER EQUIPMENT INSTALLED IN OR ON THIS PV SYSTEM MAY ADVERSLY AFFECT THE OPERATION OF THE PVRSS. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT THE COMPLETED PV SYSTEM MEETS THE RAPID SHUTDOWN FUNCTIONAL REQUIREMENTS.  
PLEASE CONTACT AUTHORIZED SERVICE AGENTS FOR ANY SERVICE WORK.

### WARNING

WHEN THE PHOTOVOLTAIC ARRAY IS EXPOSED TO LIGHT, IT SUPPLIES A DC VOLTAGE TO THE HY-RSD.

### 3. FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

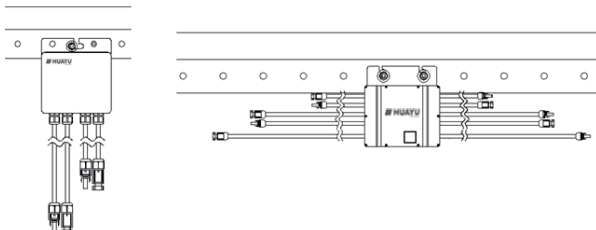
### 4. Installation



BE AWARE THAT INSTALLATION OF THIS EQUIPMENT INCLUDES RISK OF ELECTRIC SHOCK. NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED WHEN A GROUND FAULT IS INDICATED.

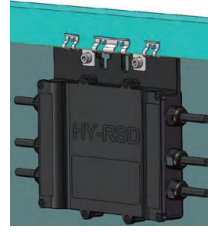
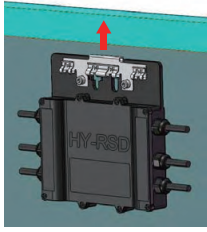
#### 4.1 Attach HY-RSD to the Racking

Mount HY-RSD on the racking use hardware recommended by module racking vendor. Recommend bolt size of 1/4" and torque no more than 76 in lbs.



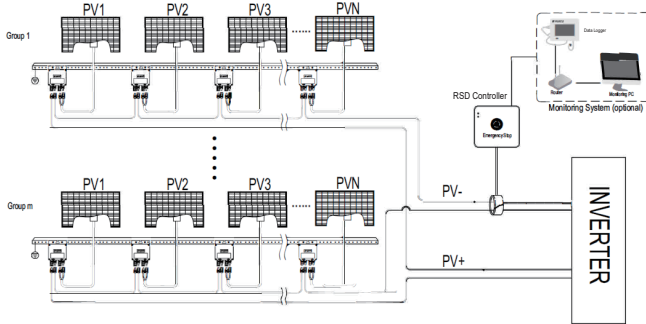
If the HY-RSD is mounted at the back of a PV panel, installer shall follow PV module installation instructions. The minimum distance between any portion of HY-RSD to the back of the PV panel shall be at least 0.5 in.

#### 4.2 Frame Mount Diagram

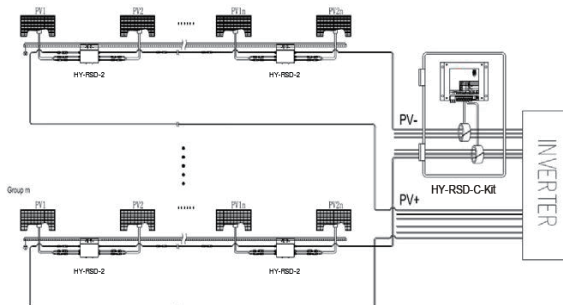


## 4.3 HY-RSD System Diagram

### 4.3.1 HY-RSD-1 System Diagram



### 4.3.2 HY-RSD-2 System Diagram



Port PV-1 must be connected to a PV panel to power the HY-RSD.  
Cables (PV+ and PV-) of an unused PV port shall be connected.

## 5. Operating Instructions

### WARNING

HY-RSD RAPID SHUTDOWN SYSTEM SHALL BE CHECKED AFTER INSTALLATION. TEST SHALL BE DONE AT DAYTIME AND WITH ALL INVERTERS HAVE STOPPED GENERATING POWER. BY MANULLAY PUSHING DOWN THE EMERGENCY BUTTON OR DISCONNECTING AC POWER SUPPLY OF HY-RSD CONTROLLER, THE DC VOLTAGE ACROSS ANY PV CONDUCTORS AND BETWEEN ANY PV CONDUCTORS AND GROUND SHALL DROP TO LESS THAN 30 VDC WITHIN 30 SECONDS. INSIDE THE CONTROLLED ZONE, THE DC VOLTAGE ACROSS ANY PV CONDUCTORS AND BETWEEN ANY PV CONDUCTORS AND GROUND SHALL DROP TO LESS THAN 80 VDC WITHIN 30 SECONDS.

### WARNING

HY-RSD RAPID SHUTDOWN SYSTEM SHALL BE CHECKED REGULARLY TO MAKE SURE IT FUNCTIONS PROPERLY. TEST SHALL BE DONE AT DAYTIME AND WITH ALL INVERTERS HAVE STOPPED GENERATING POWER. BY MANULLAY PUSHING DOWN THE EMERGENCY BUTTON OR DISCONNECTING AC POWER SUPPLY OF HY-RSD CONTROLLER, THE DC VOLTAGE ACROSS ANY PV CONDUCTORS AND BETWEEN ANY PV CONDUCTORS AND GROUND SHALL DROP TO LESS THAN 30 VDC WITHIN 30 SECONDS. INSIDE THE CONTROLLED ZONE, THE DC VOLTAGE ACROSS ANY PV CONDUCTORS AND BETWEEN ANY PV CONDUCTORS AND GROUND SHALL DROP TO LESS THAN 80 VDC WITHIN 30 SECONDS.

### WARNING

RAPID SHUTDOWN SHALL ONLY BE INITIATED AFTER INVERTERS HAVE STOPPED GENERATING POWER, THROUGH DISCONNECTING MAIN AC SWITCH OR INVERTER AC SWITCH.

HY-RSD are powered by the output of PV panels. Thus rapid shutdown is operable during daytime when the PV panel is energized. Rapid shutdown can be activated by one of the following two operations only after inverters have stopped generating power:

Option-1: Disconnect AC power supply.

Option-2: (OPTION) Press the E-STOP button attached to the RSD controller.

To re-connect the PV panels, a re-connection command can be sent to each RSD by the following steps:

Option-1: Reconnect AC power supply.

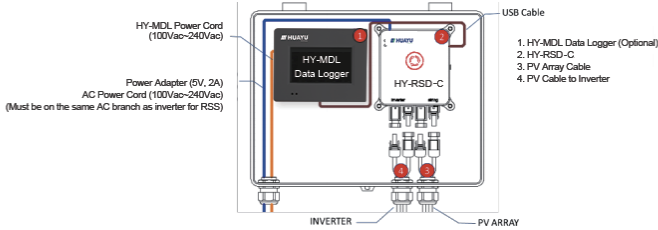
Option-2: (OPTION) Release the E-Stop button attached to the RSD controller

This operation can only be done at day time since the RSD is powered by PV

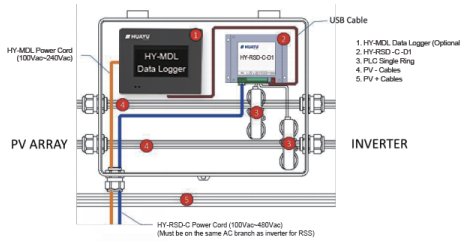
## 6. PV Panel Monitoring Using HY-MDL (Optional)

Using HY-MDL data logger, DC current, voltage, power, daily energy, and temperature of each PV panel can be monitored using MICROVIEWER locally, or Huayu Portal remotely. HY-MDL usage should refer to the HY-MDL data logger manual.

Connection of HY-MDL and HY-RSD-C:



Connection of HY-MDL and HY-RSD-C-D1:



## 7. Specification

HY-RSD-n (n=1/2/3/4)		HY-RSD
INPUT (DC)	Max DC Open Circuit Voltage (Vdc)	90Vdc per input
	Max DC Input Current (Adc)	15
OUTPUT(DC)	Maximum Output Current (Adc)	15/20
	Maximum Output Voltage (Vdc)	0 ~ Voc(*n)
SYSTEM	PV Cable	12 AWG
	Maximum System Voltage (Vdc)	1000/1500
	Communications	DC Power Line
PROTECTION	Protection Degree	NEMA-6
	Ambient Temperature	-40 C ~ +85 C
	Product Safety Compliance	UL 1741 CSA C22.2 No. 107.1 NEC 2014/2017 690.12 Canada CEC 2015 64-218



HY-RSD-C		HY-RSD Remote Controller
INPUT (DC)	DC Input	5V, 2A <sub>dc</sub>
SYSTEM	Maximum System Voltage (V <sub>dc</sub> )	1000/1500
	Communications	DC Power Line
PROTECTION	Protection Degree	NEMA-1
	Ambient Temperature	-20 C ~ +85 C
	Product Safety Compliance	UL 1741 CSA C22.2 No. 107.1 NEC 2014/2017 690.12 Canada CEC 2015 64-218
CONTROL	Optional Controls	On-Grid / OFF-Grid Primary / Secondary 5V <sub>dc</sub> output for relay
MONITORING	Optional Monitoring	Panel-by-Panel with HY-MDL

HY-RSD-C-D1		HY-RSD Remote Controller
INPUT (AC)	AC Input	100~480Vac, 0.2A <sub>ac</sub>
SYSTEM	Maximum System Voltage (V <sub>dc</sub> )	1000/1500
	Communications	DC Power Line
PROTECTION	Protection Degree	NEMA-1
	Ambient Temperature	-20 C ~ +85 C
	Product Safety Compliance	UL 1741 CSA C22.2 No. 107.1 NEC 2014/2017 690.12 Canada CEC 2015 64-218
CONTROL	Optional Controls	On-Grid / Off-Grid Primary / Secondary 5V <sub>dc</sub> output for relay
MONITORING	Optional Monitoring	Panel-by-Panel with HY-MDL

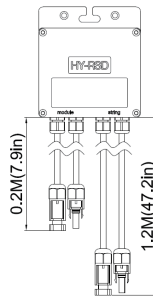
HY-RSD-C-D2		HY-RSD Remote Controller
INPUT (DC)	DC Input	12V <sub>dc</sub> , 1A <sub>dc</sub>
SYSTEM	Maximum System Voltage (V <sub>dc</sub> )	1000/1500
	Communications	DC Power Line
PROTECTION	Protection Degree	NEMA-1
	Ambient Temperature	-20 C ~ +85 C
	Product Safety Compliance	UL 1741 CSA C22.2 No. 107.1 NEC 2014/2017 690.12 Canada CEC 2015 64-218
MONITORING	Optional Monitoring	Panel-by-Panel with HY-MDL

## 8. Models and Marking

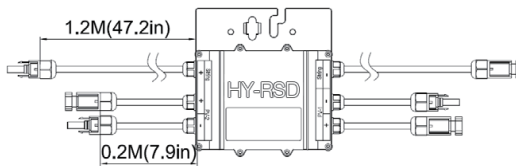
### 8.1 PV Connector Options

xy	Manufacturer	Male Connector	Female Connector
A	Stäubli Electrical Connectors (MC)	PV-KST 4/6X-UR	PV-KBT4/6X-UR
B	QC Connectors	QC4.10	QC4.10
C	Xietong Connectors	PV-XT101.1(M)	PV-XT101.1(F)
D	Amphenol	UTXCMA4AM	UTXCMA4AM

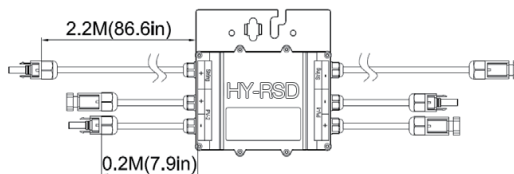
### 8.2 HY-RSD-1-xy



### 8.3 HY-RSD-2-P-xy

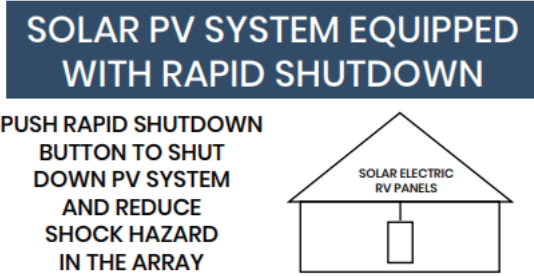


### 8.4 HY-RSD-2-L-x



## 9. System Mark

The following label shall be permanently placed close to the HY-RSD-C remote controller.



## Huayu Portal - Mobile App



Add: No.456 Xingning Road, Ningbo 315100, P.R.China

Tel: +86-574-8925 8801

E-mail: [info@huayu-energy.com](mailto:info@huayu-energy.com)

Website: [www.huayu-energy.com](http://www.huayu-energy.com)