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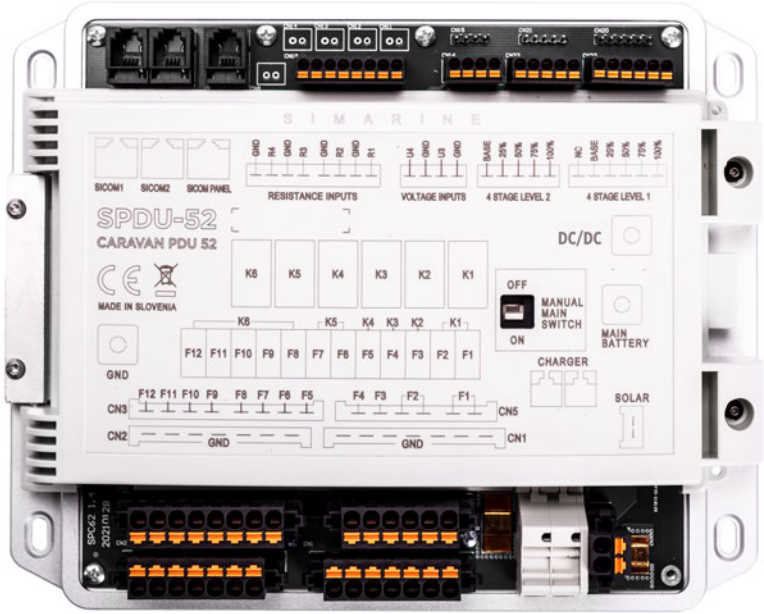


CARAVAN SPDU-52

USER MANUAL

V1.6☒

EN

USER MANUAL☒ - V 1.6☒

CARAVAN SPDU-52

1

Introduction

1. Introduction

Simarine SPDU-52 power distribution unit is a very versatile module. It's purpose is to power other modules and shunts, which are used by the Caravan Panel.

The SPDU-52 has 3 SICOM ports, two for additional power outputs input/outputs (SICOM 1, SICOM 2) and one for the Caravan Panel (SiCOM PANEL).

The SPDU-52 has two batteries (main and starter Battery), the voltage output is 8–22 VDC, and the temperature range is from –10 to +70°C (from +10 to +160°F).

SPDU-52 also has 4 channels (Solar, Charger, Main battery, Starter battery) that measure current. The accuracy is ± 2%.

The voltage measuring on any of these channels is 0–35 VDC with an accuracy of ±0,5%.

The resistance measuring on any of these channels is 0–65kohm with an accuracy of ±3%.

The SPDU-52 with additional modules can connect up to 6 batteries, 24 shunts, 10 temperature sensors, 14 tank level sensors, 2 inclinometer sensors.

2

Safety

2. Safety

Only qualified electricians with proper safety equipment should make installation of Simarine electronics. When working with batteries, you should wear protective clothing and eye protection.

CAUTION: Batteries contain acid, a corrosive, colorless liquid that can burn your eyes, skin, and clothing. Should the acid come in contact with eyes, skin, or clothing, wash it immediately under fresh water for at least 15 minutes and seek medical support immediately.

CAUTION: Do NOT connect anything to a damaged battery. It could heat up, catch fire, or explode.

CAUTION: Lead-acid batteries can generate explosive gases during operation. Never smoke, allow flames, or sparks near the battery. Make sure to keep sufficient ventilation around the battery.

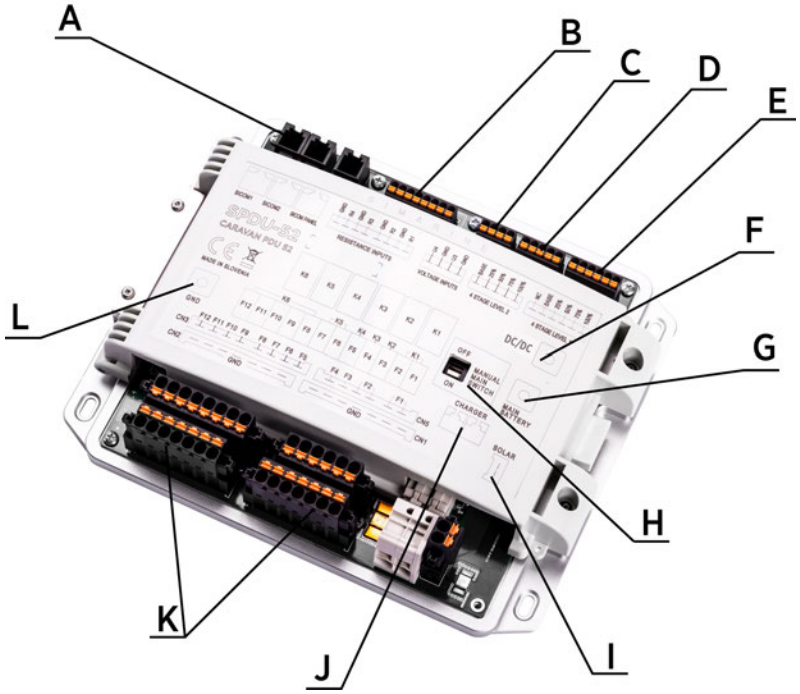
CAUTION: When working with a battery, remove all personal metal items like watches, rings, necklaces, and bracelets. Metal items in contact with the battery terminals might cause a short circuit with a very high electric current, which may heat up and melt nearby objects and cause severe burns.

3

Overview

3. Overview

The following picture displays the SPDU-52



A - 2 SiCom, 1 SiCOM Panel
B - Resistance inputs
C - Voltage inputs
D - 4 stage level 2
E - 4 stage level 1
F - DC/DC
G - Main battery
H - Manual main switch
I - Solar charger
J - Charger
K - Inputs and outputs
L - Common ground

4

Installation

4. Installation

4.1 Mounting

CAUTION: Install the power unit in a clean and dry place protected from accidental spilling of liquids.
Remove the shunt cover by unscrewing two screws on top of the power unit cover.

To install the power unit using supplied voltage cables find a place no further than 3 m away from the battery/battery bank.
You can fix the power unit with the supplied screws using four holes (two on each side) on bottom of the casing.

4.2 Cables

CAUTION: Failure to observe the required cable cross-sections can damage the shunt, wiring, or cause a fire.

SiCOM data cable:
- For the SiCOM connection use the supplied cable.

Cable length C

Cable length	Cable type
< 5m	No limitations
>= 5m	2x2x0.25 mm2 twisted pair (recommended)

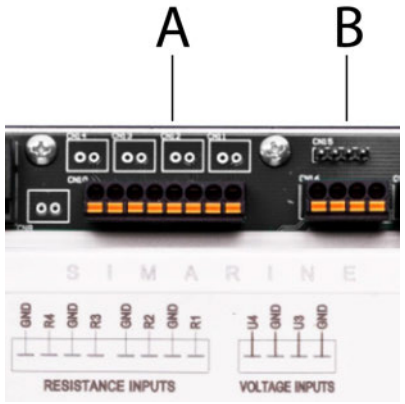
4.3 SICOM Panels

A - SiCOM1 port, used for an optional power input (e.g. extra port to connect a SIMARINE module).

B - SiCOM2 port, used for an optional power input.

C - SiCOM PANEL port, used to **connect the Caravan Panel**.

4.4 Resistance & Voltage Inputs

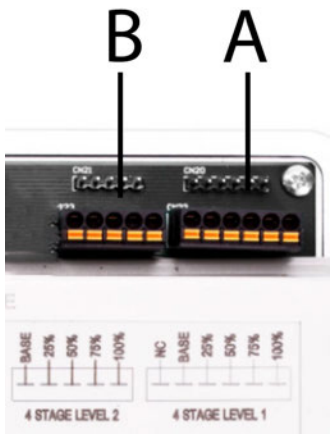


A - Resistance inputs, the cable arrangement doesn't matter, because the cable used here is black (the black cable goes to R and GND).

The resistance inputs are for potential connections that are resistance based (e.g. tanks, freezer, etc.).

B - Voltage inputs, used for user sensors. Voltage range is from 0 to 75V (the red cable goes to U4 and U3, the black cable goes to GND).

4.5 4 Stage Level 1 & 2

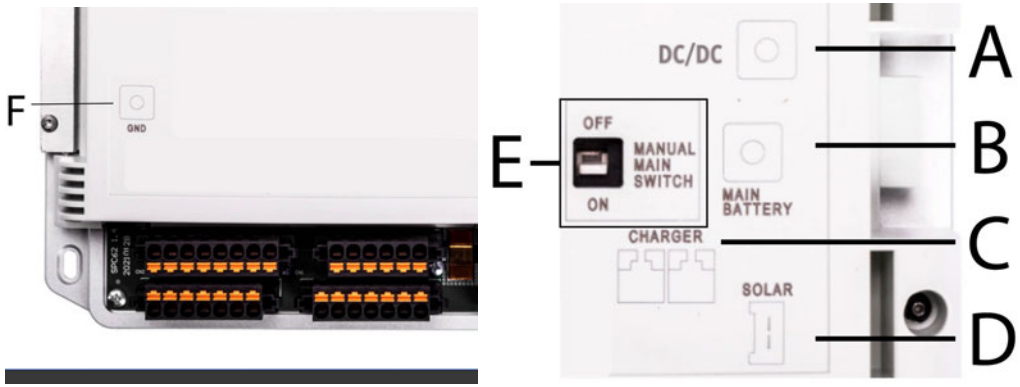


A – 4 stage level 1, all sensors are connected to base and individual sensors to the 25%, 50%, 75%, and 100% input. The NC stands for "not connected", meaning it doesn't require an input.

B – 4 stage level 2, the same as the 4 stage level 1 sensor, sensors connected to base and individual sensors to the 25%, 50%, 75%, and 100% input.

Cables: **Red** goes to the base input, **black** goes to the rest of the inputs (25%, 50%, 75%, 100%).

4.6 Batteries, Chargers, Ground, Main Switch



A - DC/DC, (current: **50A)**

B – MAIN BATTERY, (current: **50 A**) – has the same current as the **solar panel, charger.**

C – CHARGER, (current: **40 A)** – connect to the main battery and main ground (GND). The charger has the same current as the **solar panel** and **the main battery.**

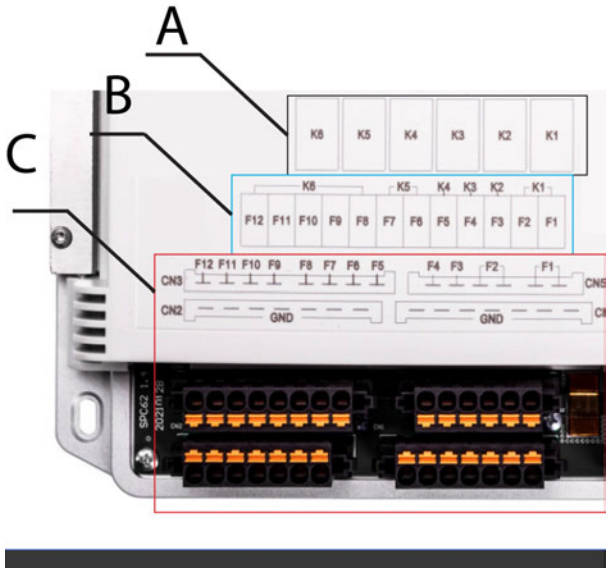
D – SOLAR CHARGER, (current: **16A)**

E - MANUAL MAIN SWITCH, turn the power of the SPDU-52 ON or OFF.

F - GROUND – connect each module that requires to be grounded to the GND.

Note: **Charger, solar panel** and **main battery** all have the same current.

4.7 Relays, Inputs



A - Relays K1-K6

The configuration for the functionality of the K1–K6 buttons can be changed in the program. The default settings however, are the following:

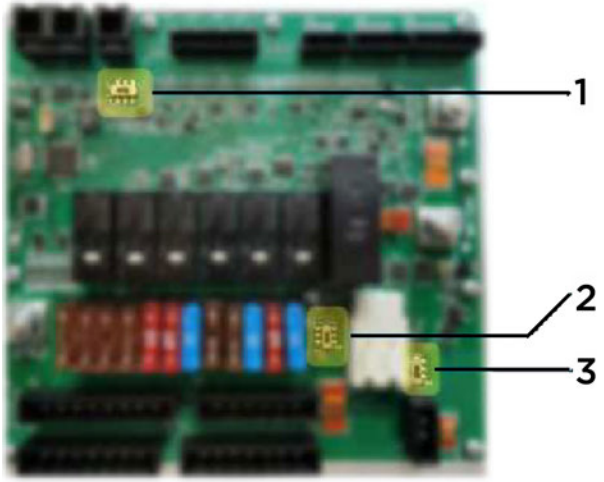
- K1 - Fridge
- K2 - Heating
- K3 - AC
- K4 - Aux
- K5 - Water pump
- K6 - Lighting

B - Connections

C - Connection inputs and outputs

4.8 DIP Switches

In the new SPDU-52 version, there are three new additional DIP switches (SW1-SW3). These can be found under the cover of the SPDU-52.



1. Solar switch 18 - **ON** (down position) / **OFF** (up position)
2. Charger switch 19 - **ON** (down position) / **OFF** (up position)
3. Main control switch 19 - **ON** (left position) / **OFF** (right position)

Having the main control switch adds an additional >3mA to the electrical current output.

4.8.1 Solar Charger Switch

The solar battery switch (SW1) is meant mainly for the newer solar panel chargers or chargers that require a voltage signal feedback for the charger in order to begin charging.

Most charger don't require a voltage signal feedback in order to charge. In these cases you can keep the switch **OFF.**
Turn the switch **ON** if your solar charger requires a voltage signal feedback in order to charge.

4.8.2 Shore Charger

The same principle goes for the shore battery charger.

The shore battery charger switch (SW2) is meant mainly for the chargers that require a voltage signal feedback for the charger in order to begin charging.

Most charger don't require a voltage signal feedback in order to charge. In these cases you can keep the switch **OFF.**
Turn the switch **ON** if your charger doesn't charge and requires a voltage signal feedback in order to charge.

4.8.3 Main Control Switch

By keeping the switch **OFF** the SPDU-52 also turns **OFF** if you turn off the control panel. We suggest that you keep the switch turned **ON.**

Having the switch **ON** keeps the calculations of the state of charge of the battery.

Turning the switch **OFF/ON** turns the **relays** (**K1-K6)** off/on.

5

Connecting

5. Connecting

The **Caravan Panel** must be connected to the third port on the SPDU-52 (**SICOM PANEL**) or it will not work.

If you have an **Inclinometer** module you can connect it directly to the second port of the **Caravan Panel** or you can connect the module to SiCOM port 1 or SiCOM port 2.

Resistance inputs can be used to connect the **temperature sensor**, **resistance tank sensor, the 4 stage level tank, any resistance based sensor,** etc.

Auxiliary voltage input, can be used to connect any sensor that outputs voltage.

4 stage level 1 & 2, each pin is connected to a percentage mark (25%, 50%, 75%) and one is connected to base input for power. The NC in the 4 stage level 1 stands for "not connected" and does not require an input.

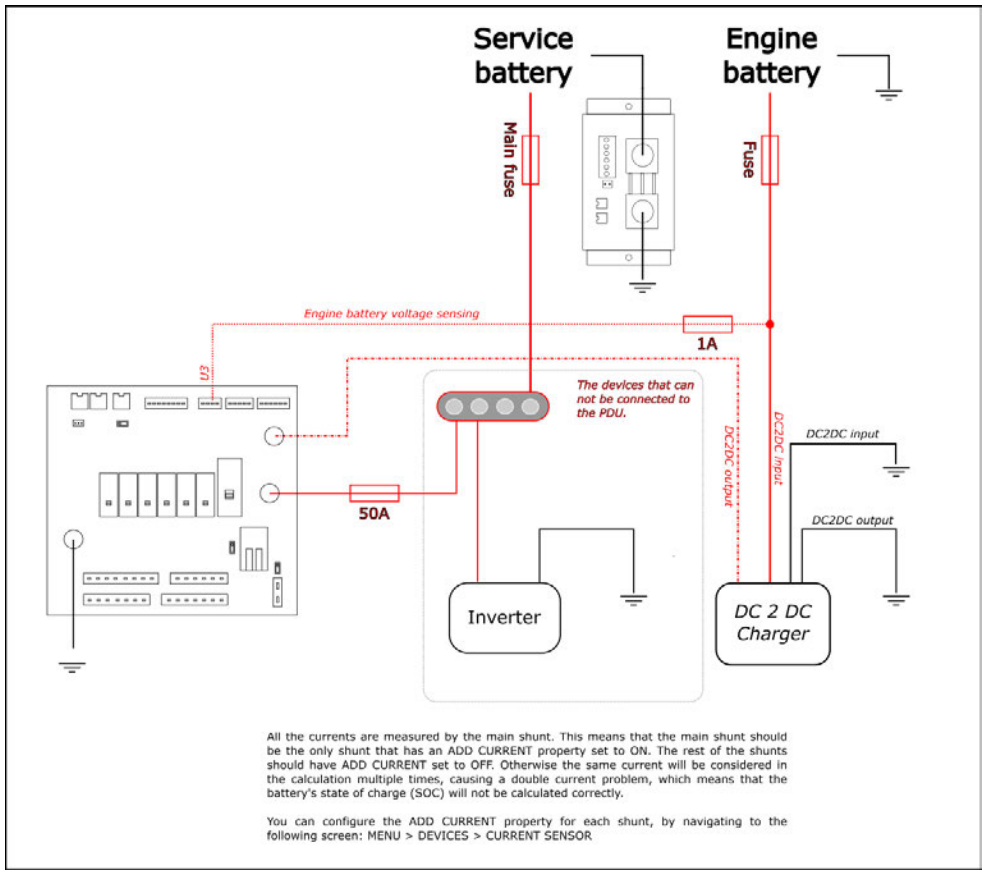
Starter & main battery must be connected to the ground on the SPDU-52 (black cable connected to GND).

Charger and solar charger both have to be connected to the main battery and common ground (GND on SPDU-52).

F1–F12 are connected to any external devices.
- For example, **F1 and F2** ports are connected to the main **battery**. **F3** connects to the **heating** and so on.

(You can find the information of all relay connections on the physical cover of the SPDU-52 or under the **Diagram** section)

5.1 Diagram


Service battery
Engine battery
Main fuse
Fuse
Engine battery voltage sensing
1A
U3
The devices that can not be connected to the PDU.
DC2DC output
DC2DC input
DC2DC input
DC2DC output
50A
Inverter
DC 2 DC Charger
All the currents are measured by the main shunt. This means that the main shunt should be the only shunt that has an ADD CURRENT property set to ON. The rest of the shunts should have ADD CURRENT set to OFF. Otherwise the same current will be considered in the calculation multiple times, causing a double current problem, which means that the battery's state of charge (SOC) will not be calculated correctly.
You can configure the ADD CURRENT property for each shunt, by navigating to the following screen: MENU > DEVICES > CURRENT SENSOR

6

Technical specifications

6. Technical specifications

Operating	
Voltage range	8 - 22V DC
Main battery	8 - 22V DC
Starter battery	8 - 22V DC
Temperature range	-20°C – 70°C (-4°F – 158°F)
Power consumption at 12V	
Operating	15mA
Power off	0,25mA
Current measuring	
Channel 1 (solar)	0 - 16A
Channel 2 (charger)	0 - 40A
Channel 3 (main battery)	0 - 50A
Channel 4 (starter battery)	0 - 50A
Accuracy	±1%
Resolution	±0.01 A
Sample rate	100ms
Voltage measuring	
Channel 1 (starter battery bank)	0-22V
Channel 2 (main battery bank)	0-22V
Channel 3 (U3)	0-75V
Channel 4 (U4)	0-75V
Voltage measuring (U1, U2, U3, U4)	

Accuracy	±0,3%
Resolution	1mV
Sampling rate	100ms
Resistance inputs (R1, R2, R3, R4)	
Range	0 - 65kohm
Accuracy	± 3%
Temperature sensor – NTC 10k	
Range	From –13°C to +80°C
Accuracy (from –10 to +60°C, from 14 to 140°F)	± 3,0%
Maximum continuous current for output channels	
K1	20A
K2	20A
K3	15A
K4	15A
K5	10A
K6	10A
All channels combined (max. continuous limit)	50A
Dimensions (without connectors)	
SPDU-52	200 x 160 x 42 mm
	7,87 x 6,3 x 1,65in
Connectivity	SiCOM

7

Troubleshooting

7. Troubleshooting

If the Caravan Panel is showing wrong sign for current value. Check if the shunts are correctly installed. This means the consumers/generators minus (optionally plus) terminal is connected to the IN terminals on the shunts. If this is not the case, you can reinstall the shunts or simply switch the IN and OUT terminal via the shunt configuration on the Caravan Panel.

If the solar panel charger or shore power chargers are not charging - make sure that the DIP switches (under the SPDU-52 cover, SW1 & SW2) are turned **ON**.

7.1 Shunt Sensors not visible

If the shunt sensor is not visible in the Caravan Panel menu, check the following:

- Is the Caravan Panel properly connected to the **SiCOM PANEL** port (Third port on SPDU-52)?
If you are using your own SiCOM cable, make sure it has the right square and is twisted.

- Is the Inclinometer module connected properly to SiCOM port 1 or 2 on the SPDU-52 or directly to the Caravan Panel?

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Safe Voyage.