

*Instruction Manual*

# SAA Field Power Unit

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## Notices

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## 1. Introduction

The SAA Field Power Unit is a portable unit designed to provide power to the SAA, and to convert communications protocols allowing for communication via USB between the SAA and a PC running SAARecorder Software. It is designed for use when data is manually collected from an SAA in the field or in the office.

## 2. Description

The SAA Field Power Unit weighs approximately 4.85 kg (10.7 lbs) and is contained within a sealed yellow plastic shell measuring approximately 27 cm x 25 cm x 12 cm (10.7" x 9.8" x 4.8"). It contains a sealed 12 V, 7 Ah rechargeable battery which is used to power the SAA. Connection to an SAA is achieved via one of two connectors, either a 4-pin circular connector (see A in Figure 2.1) or a 5-pin terminal block (B in Figure 2.1). These connectors are internally connected to an isolated SAA digital interface with the following features: integrated power switch, surge suppression, and an SAA regulated DC:DC power selectable to 13.5 V, 15.0V, and 16.5V (C in Figure 2.1). The latter feature allows for the voltage to be increased, if necessary, for long arrays. An auxiliary 4-pin terminal block is included and can be used to power other equipment or to check the battery voltage (D in Figure 2.1).

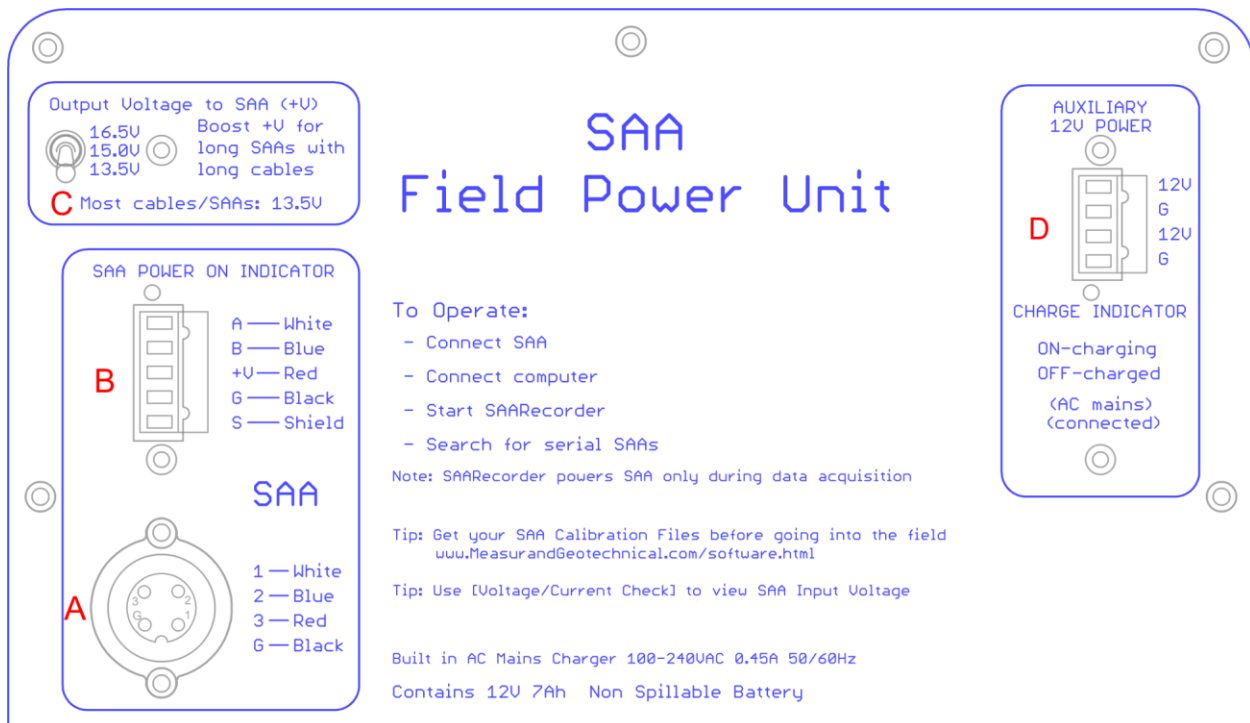


Figure 2.1 - SAA Field Power Unit Interface. (A) 4-pin circular connector, (B) 5-pin terminal block, (C) Voltage selector, (D) Auxiliary 4-pin terminal block.

### 3. Using the SAA Field Power Unit for Data Collection

When using the SAA Field Power Unit, it is necessary to connect both an SAA and a PC running the SAARecorder utility to the unit. SAARecorder is part of the SAASuite which can be downloaded at <http://measurandgeotechnical.com/software.html>. Power to the SAA is controlled via SAARecorder. Therefore, for safe operation of the SAA and SAA Field Power Unit, it is recommended that the following connection and disconnection sequences be followed:

- 1) To Connect:
  - a. Connect the SAA to the SAA Field Power Unit (See Section 3.1);
  - b. Connect the SAA Field Power Unit to the computer via the wireless pair or USB (See Section 3.2);
  - c. Open SAARecorder software; then
  - d. Search for serial arrays in SAARecorder.
- 2) To Disconnect:
  - a. Turn off SAARecorder software to power down the SAA;
  - b. Disconnect the SAA Field Power Unit USB cable from the computer;
  - c. Disconnect the SAA from the SAA Field Power Unit

Note that the sequences are reversed. For ease of use, connection instructions are printed on the SAA Field Power Unit facing panel.

#### 3.1 Connecting an SAA to the SAA Field Power Unit

Two separate methods have been provided for connecting SAAs to the SAA Field Power Unit. The method selected will depend on whether or not a circular connector is attached to the SAA (determined at the time of purchase).

##### 3.1.1 Connecting an SAA via 4-pin circular connector

For SAAs with a circular connector, connect the SAA directly via the 4-pin circular Connector shown in Figure 2.1 (A). In order to ensure a good connection, turn the connector until it is finger tight, and make sure that the gap between the connectors does not exceed 1 mm (0.04").

##### 3.1.2 Connecting an SAA via 5-pin terminal block

For SAAs without a circular connector, it is possible to connect the SAA to the SAA Field Power Unit via the 5-pin terminal block shown in Figure 2.1 (B). An SAA cable contains five different wires which are used for power (red and black), communications (white and blue) and shielding (bare wire). These are connected to the terminal block in the order shown on the face plate of the SAA Field Power Unit. To open and close the terminal blocks, use the small flathead screwdriver provided with the SAA Field Power Unit. Prior to connecting the SAA Field Power Unit to the computer, make sure that each wire is securely fastened into the block.

### 3.2 Connecting the Computer to the SAA Field Power Unit

There are two different methods which can be used to connect a computer running SAAREcorder to the SAA Field Power Unit. Communication between the SAA Field Power Unit can be done either via a wireless pair included with the SAA Field Power Unit, or via direct connection via a USB port on the computer (Figure 3.1). More details on these two communications methods are given below. Once the computer is connected to the SAA Field Power Unit, SAAREcorder will automatically power the SAA upon start-up. Note that the LED located above the 5-pin terminal block connector will light when SAAREcorder is attempting to connect to or is connected to the SAA. For more information on how to use SAAREcorder, please refer to the SAAREcorder Manual which can be found in SAASuite.



Figure 3.1: Options used for connecting the field unit to a computer running SAAREcorder.

#### 3.2.1 USB connector

In order to connect a computer running SAAREcorder to the SAA Field Power Unit using the USB port, connect the serial to USB cable provided with the SAA Field Power Unit to the serial cable on the front facing plate of the SAA Field Power Unit. Once this is done, plug the USB connector into a USB port on the computer. The serial connection does not have any screws because it is meant to act as a quick release point in case the cable is snagged or the SAA Field Power Unit falls.

#### 3.2.2 Wireless pair

The SAA Field Power Unit comes equipped with a wireless cable replacement feature for use when a wired connection to your PC is inconvenient. The included serial to USB cable, shown in Figure 3.1, can be replaced by a set of two wireless adapters. Note that these adapters work as a pair, and each adapter will only work with its mate. One adapter in the pair is equipped with a 9-pin connector and replaces the Field Unit serial to USB cable. The other adapter is equipped with a USB plug to connect to your PC. These two adapters are "paired" and programmed at the factory and require no user setup. To the PC these adapters look the same as the directly connected cable. A new serial COM port will be installed

the first time the SAA Field Power Unit is connected to your PC using the wireless pair. The communication range of the wireless pair is approximately 20 m.

When plugging in the USB wireless adapter, wait for the blue LED in the adapter to stop blinking and become solid. This indicates that the connection to the adapter connected to the SAA Field Power Unit has been established. Once the connection has been established, open SAAREcorder. If the blue LED continues to blink, make sure that the other adapter is properly connected to the serial cable. Because it is possible to have some interference with the wireless communications, it is necessary to add a timeout in SAAREcorder. This is done in the SAAREcorder Startup by checking the “Using Serial-to-Ethernet Device” box (Figure 3.2). Once the box is checked, it is possible to modify the timeout from the default 500 ms. The recommended range for the timeout is 200 ms to 500 ms.

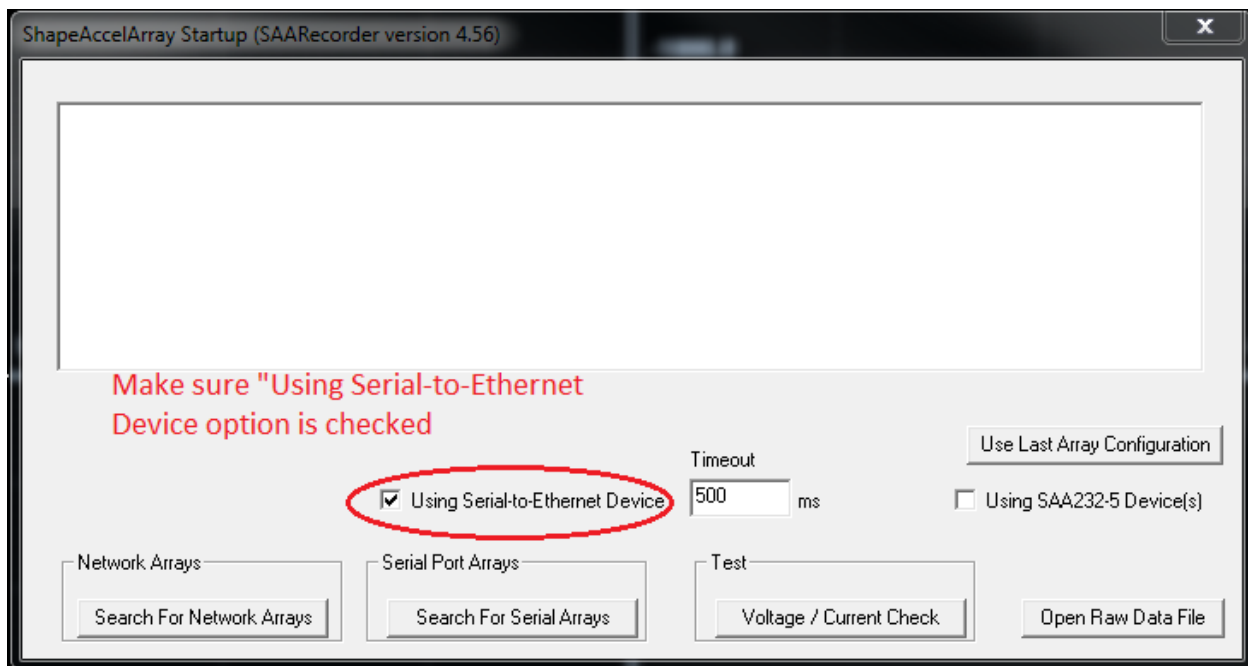


Figure 3.2: Adding a timeout in the startup window in SAAREcorder.

## 4. Maintenance

### 4.1 General

To maximize the reliability of the SAA Field Power Unit, keep the following points in mind when using the unit:

- The SAA Field Power Unit is splash proof. Keep in mind that though it is in a sealed container, it will not withstand complete immersion in water.
- The face plate should be kept clean and dry, and the unit should be stored in a warm, dry place when it is not in use.
- Care should be taken not to allow any dirt into the connectors.

- The USB connector is not splash proof.
- The battery charger plug is not splash proof.

## **4.2 Battery**

The battery contained within the SAA Field Power Unit is a 12 V non-spillable 7Ah lead acid battery. It can be recharged by plugging the AC power cord into a 100-240 V mains power receptacle. Note that the AC power cord provided with the SAA Field Power Unit is country specific, and specified at the time of purchase. When charging the battery, the Charge LED can be used to determine the charge state. Note that the Charge LED is active only when the SAA Field Power Unit is connected to AC mains power. The duty cycle of the LED indicates charging activity as follows:

- LED is mostly on with brief off blinks: fast charging a depleted battery (2 to 3 hours to complete)
- LED is blinking on and off: charging nominally
- LED is mostly off with brief on blinks: unit is charged

When the unit is charged, it should be disconnected from the AC mains, and stored. A fully charged unit will operate an SAA for approximately 10 hours.



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## 5. Specifications

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Power system:	12 V, 7 Ah non spillable lead acid battery
	2 A constant current universal AC input charger power supply
	SAAREG temperature compensated charge regulator
	AC power cord, permanently attached, country specific
	Auxiliary 4-pin terminal block for 12 V power
SAA connection:	5-pin terminal block
	4-pin circular connector (Eco Mate™ C016 series connector C016 20G003 100 12)
Computer connection:	Serial to USB cable
	Wireless pair
Operating temperature:	-30 °C to +50 °C
Dimensions:	272 mm x 248 mm x 123 mm
Weight:	4.85 kg

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