

# PLD-SCC1 User Manual

Battery Odometer

October 20, 2011

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# Chapter 1

## Introduction

Thank you for purchasing the PLD-SCC1 Battery Odometer. The SCC1 is a compact and accurate mAh odometer/fuel-gauge which is simple to install and use. The SCC1 allows you to determine your remaining battery capacity using mAh counting rather than the less reliable voltage sensing methods that are used for Ni\* and Li\* chemistries.

### 1.1 Specifications

**Chemistries:** All battery chemistries, including A123/LiFe

**Voltage:** 4.0~8.5V (2S lipo maximum)

**Current:** 0~9,999mA (5A average max)

**Maximum-Battery-Capacity:** 12,800mAh

**Charge-resolution:** 0.85mAh

**Weight:** 10~12g ( ~0.4oz )

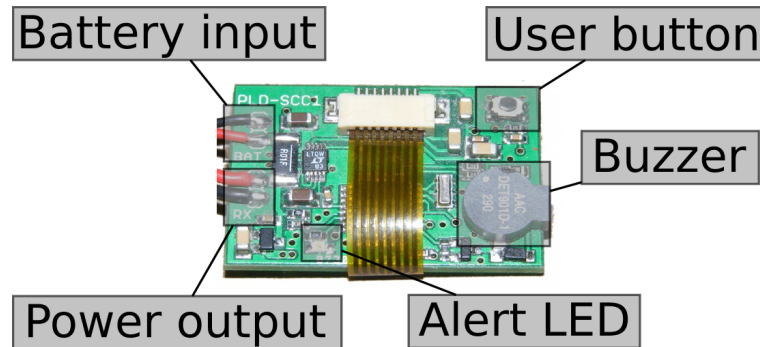
**Size:** 38 x 25 x 7mm size (1.5 x 1 x 0.25")

**Connections:** Two pairs of 20AWG bare silicon fly leads

**Interface:** Single miniature button on rear of unit. Single buzzer.  
Single green LED

**Packaging:** Rubberised clear heat-shrink

## 1.2 Product layout



## 1.3 Installation

Installation of the PLD-SCC1 Odometer is very simple. The PLD-SCC1 is installed in between your current battery pack or regulated supply and the receiver/servos/flight-equipment. Take note of the side of the cabling to use for the battery pack (supply) and the flight equipment (load) - (See figure 1.1) . Because each setup is different, the PLD-SCC1 is supplied with high current silicon leads which you will be required to fit your own connectors or connect directly to your equipment. We recommend using connectors that are rated for 5A continuous and 10A burst loads, standard "JST" connectors are *not* recommended for any more than 2A continuous loads.

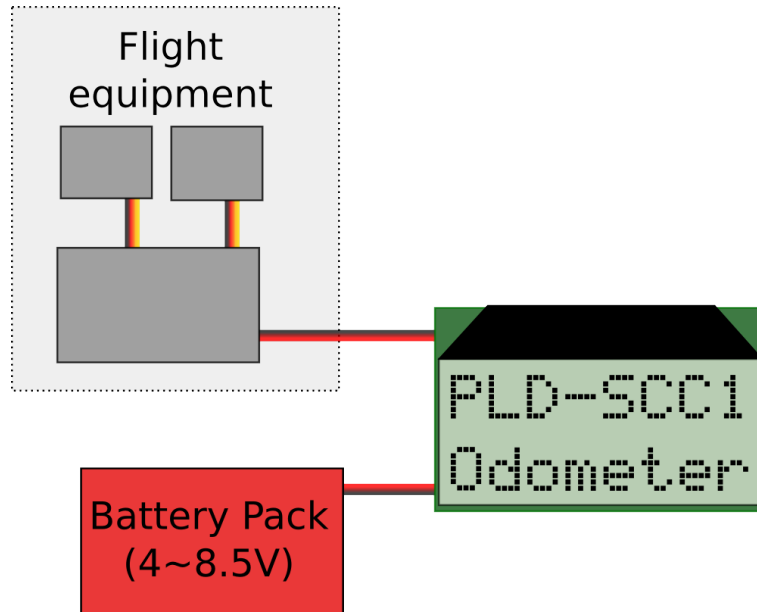


Figure 1.1: Installation

## 1.4 Setup Procedure

A note about choosing what battery capacity to configure the SCC1 with: It is recommended that you put in a capacity that is 10~15% lower than the actual stated capacity of the battery pack, so for a 1000mAh battery, set the SCC1 to 850~900mAh. By using a lower capacity you are less inclined to risk running out of power. Also consider that between charging losses and battery internal losses you will not be able to use the full capacity of the pack (eg, the SCC1 can indicate that you used 100mAh but your charger puts back 110mAh, as 10mAh was lost within the battery itself due to internal resistance and lead losses).

To configure the SCC1 with your required battery capacity limit, you need to perform the following sequence -

**1 Boot the device. This can be achieved either by power cycling the unit or pressing the user-button until the buzzer sounds**

**2 When the boot screen appears there is a 2-second waiting window during which you need to press and hold the user-button until the Battery Capacity screen appears.**

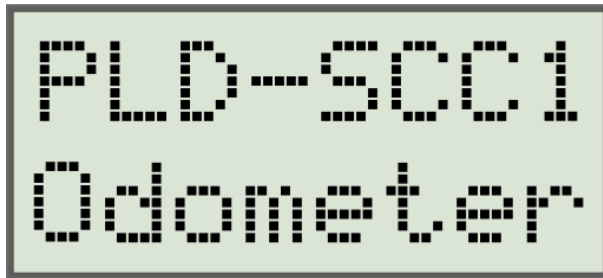


Figure 1.2: Boot screen



Figure 1.3: Battery capacity setup (start)

**3 Press and hold the user-button until the required battery capacity is obtained, or press the button individually to obtain 50mAh capacity increases.**



Figure 1.4: Battery capacity setup (end)

**4 When the required battery capacity is entered you can wait 5 seconds and the SCC1 will exit the setup mode and proceed to the normal data-display mode.**

## Chapter 2

# Data Displays

When the SCC1 initially boots or has been reset, the first display will show the full battery mAh capacity and a zero running time. The data display will cycle to the next screen approximately every 1.5 seconds. At all times the *remaining capacity* (mAh) will be displayed on the top line of the screen.



Figure 2.1: Initial time and remaining capacity screen

After running for a period with a load, the SCC1 screen will update depending on the load attached.



Figure 2.2: Time and remaining capacity screen after 4m18s

This screen shows that the system has been running a total of 4m18s and there 619mAh of capacity left before the alarm will trigger. Note the state of the battery icon indicating that ~75% is remaining.

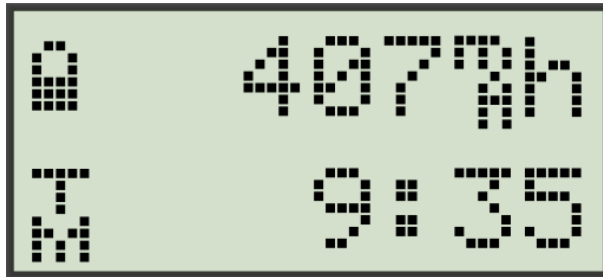


Figure 2.3: Time and remaining capacity screen after 9m35s



Figure 2.4: Current battery voltage

Shows the current voltage of the battery.





Figure 2.5: Lowest average battery voltage

Shows the lowest average voltage sensed during the current power-on period since the last forced reset.



Figure 2.6: Peak average current

Shows the highest average current detected during the current power-on period since the last forced reset. The peak current detection becomes more sensitive as the current levels increase, this is due to the peak being calculated from the time interval between consecutive pulses from the mAh counter chip.

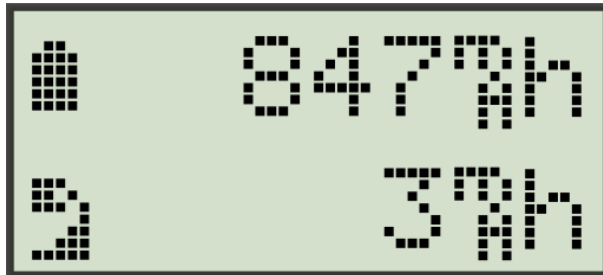


Figure 2.7: Total mAh used

Total mAh consumed since the last forced reset or reconfiguration.

## **Chapter 3**

# **Battery Empty, Battery recharge Reset and Power-out**

### **3.1 Battery Empty**

When the SCC1 has computed that the available mAh remaining is zero (0mAh), it will commence to emit several small beeps periodically and flash the green LED. You will be required to Reset the SCC1 to “refill” the counter again.

### **3.2 Resetting the SCC1 after a battery charge**

When you have recharged your battery, you will need to reset the SCC1

1. Connect the battery to the SCC1
2. Wait for the SCC1 to start displaying the data screens
3. Press and hold the user-button until you hear the beeper and/or see the green LED light
4. Release the button

The SCC1 will now be reset (Time and battery capacity should be reset)

### **3.3 Restarting the SCC1 after being powered off**

When the SCC1 is powered down and powered back up, the Time elapsed and consumed mAh capacity will be retained, however the Peak current, minimum voltage and battery voltage will be reset. This will be the typical behaviour during a normal flying day.



## Chapter 4

### Appendix

#### 4.1 Display Icons












	Time
	100-76% battery
	75-51%
	50-26%
	25-1%
	0% Empty
	Lowest voltage
	Battery voltage
	Peak current
	milli-Amps
	mAh Used

Figure 4.1: Icons used by the PLD-SCC1

## 4.2 Further information

- Product site: <http://nqrc.com/?vp=PLD-SCC1> ( <http://nqrc.com> )
- RCGroups discussion page: <http://www.rcgroups.com/forums/showthread.php?t=1477133>