

# PCU2 Control Unit for Phantom



# Updates

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Periodically, firmware updates are released that add features, enhance functionality, and fix bugs. This is a list of important changes.

**v156** - Improved Flex4K support and improved responsiveness in all modes.

**v152** - Shortcut to Bluetooth menu by holding down B or D while turning on PCU2.

The PCU2 Control Unit for Phantom Cameras and other Phantom Accessory Products are designed and manufactured by **AbelCine**.



[www.abelcine.com](http://www.abelcine.com)

# PCU2

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# 1 Introduction

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Thank you for purchasing the PCU2 Control Unit for Phantom Cameras.

The PCU2 is a controller that is compatible with most high-speed Phantom cameras. In addition to controlling a Phantom without a laptop, the PCU2 can control two Phantoms simultaneously in a stereo 3D configuration.

The PCU2 has an integrated Bluetooth transmitter, and when paired with the Vision Research Bluetooth dongle, it can control a Phantom camera from a distance of up to 100 meters (unobstructed).



# 1 Introduction

## Mounting Options

The PCU2 provides five mounting options: two 1/4-20 holes on the top, two 1/4-20 holes on the bottom, and one V-Lock on the back.

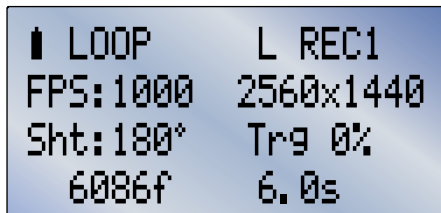


## 2 Basics of Operation

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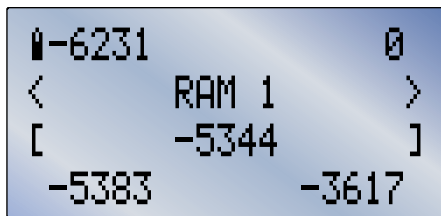
The PCU2 has two main modes of operation, Record Mode and Playback Mode.

Record Mode enables you to edit the recording parameters and control the recording process. The PCU2 starts in Record Mode.



Playback Mode allows you to control video playback and save clips to a CineMag or CineFlash.

For more details about Playback Mode, see page 15.



## 2 Basics of Operation

### Buttons

**PREV** Goes to the previous screen of parameters. In Playback Mode, skips to previous clip or to first frame of current clip.

**ADV** In Record Mode, hold PREV to enter Advanced Menu.

**LOCK** Hold PREV and NEXT to lock/unlock the PCU. When the PCU is locked, you can monitor the camera's state but no parameters can be changed and no functions can be performed.

### NEXT

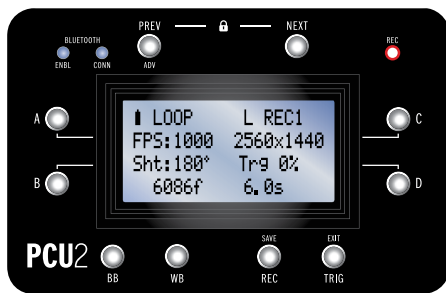
Goes to the next screen of parameters. Hold to view information about the camera connected to CAM 1.

In Playback Mode, skips to next clip or to last frame of current clip.

### REC LED

Illuminates when the camera is actively writing images to its RAM

**A**  
**B**  
Soft Keys



**C**  
**D**  
Soft Keys

**BB** Performs a black balance.

**WB** Performs a white balance.

### REC

Starts recording. If there is already a clip in the camera's RAM, hold for three seconds to erase the clip and start a new recording.

### SAVE

In Playback Mode, saves marked portion of current clip in RAM to CineMag or CineFlash.

### TRIG

Sends a trigger signal to the camera(s).

### EXIT

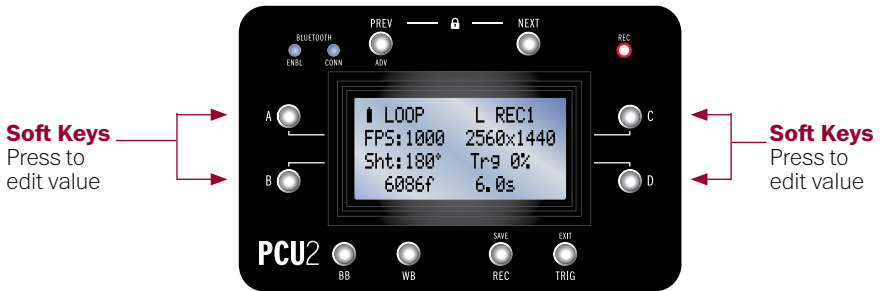
In Playback Mode, hold to return to Record Mode.



### 3 Record Mode

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In Record Mode, the PCU2 will show up to four parameters on the screen at once. The parameters can be accessed for editing by pressing the corresponding soft keys to the left and right of the screen.

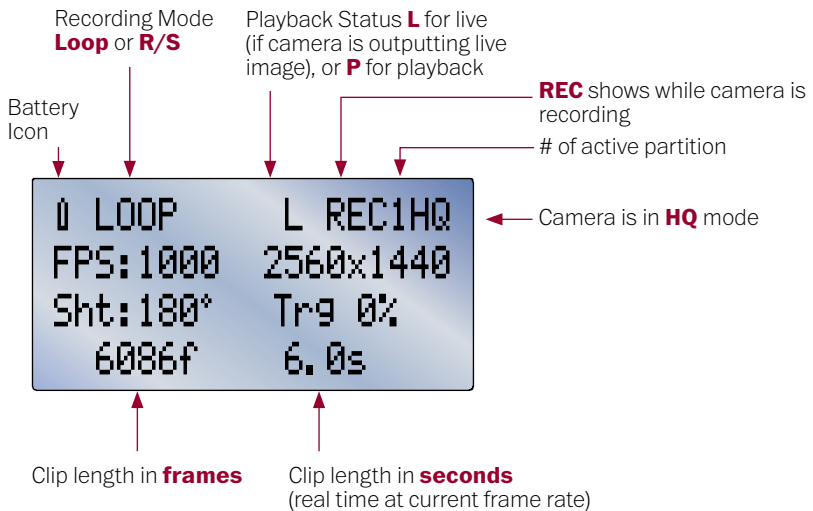


The soft key for a parameter with a wide range of values, such as frame rate, will enter Edit Mode on a new screen (see page 11). The soft key for a parameter with very few potential values will toggle through the options.

### 3 Record Mode

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The top line of the screen in Record Mode displays the recording mode (Loop or Run/Stop) and playback status (Live or Playback). There are also recording and HQ mode indicators.



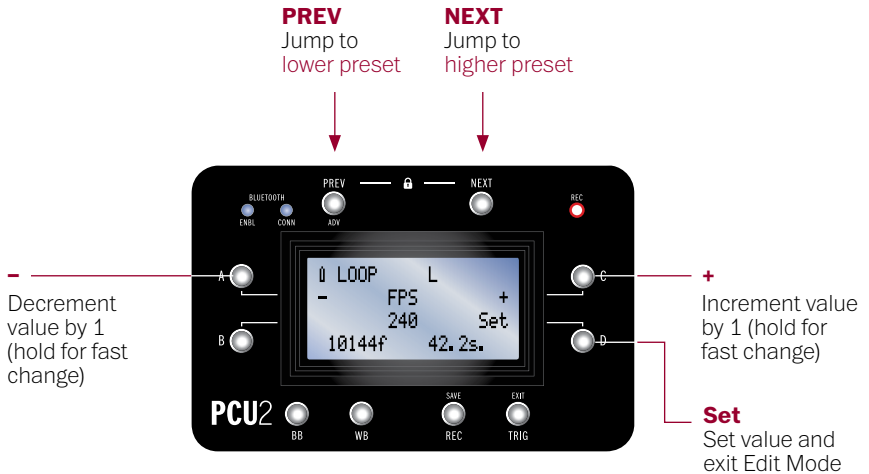
The maximum length of the current shot in frames and real time are displayed on the bottom of the screen.

# 3 Record Mode

## Editing a Parameter

While in Record Mode, the PCU2 can enter Edit Mode by pressing the soft keys.

Many parameters have a series of preset values that can be accessed by pressing the PREV and NEXT buttons in Edit Mode.



When the parameter is at the desired value, press **D**, and the PCU will exit Edit Mode.

### 3 Record Mode

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#### Shooting Parameters

| ⬇ LOOP    | L         |
|-----------|-----------|
| FPS: 300° | 1920x1080 |
| Sht: 180  | Trg: 0%   |
| 10144f    | 33.8s     |

- A - FPS:** Edit frame rate in frames per second.
- B - Sht:** Edit shutter angle.
- C - Resolution:** To select a standard resolution value, use **PREV** or **NEXT** to move the cursor over the **x** and change the paired resolution values with **A** and **C**, corresponding to **+** and **-**. To change the horizontal or vertical pixel count separately, select with **PREV** or **NEXT** and adjust with **+** and **-**.
- D - Trg:** Edit trigger point relative to the shot length; 0% represents the tail of the shot, 100% represents the head.

**Note:** On cameras with a built-in capping shutter, changing FPS, shutter or resolution will cause the PCU2 to trigger a black balance after a 3 second delay, unless AutoBB is disabled in the Advanced Menu (see page 19).

#### Video Output Parameters

| ⬇ LOOP     | L         |
|------------|-----------|
| Gain: 1.00 | Chr: 1.00 |
| Gam: 2.20  | Hue: 0    |
| 10144f     | 33.8s     |

- A - Gain:** Adjust the gain of the video signal, between 1.0 and 5.0.
- B - Gam:** Adjust gamma from a range of 1.0 to 4.0. The default is 2.2.
- C - Chr:** Adjust the chroma level between 0 and 3.0.
- D - Hue:** Shift the image color towards green or magenta. The default is 0.

### 3 Record Mode

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#### Camera Cooling Parameters

| ■ LOOP      | L REC1 |
|-------------|--------|
| CamTemp: 40 | Fan: 0 |
| SnsTemp: 25 | TE%: 5 |
| 10144f      | 33.8s  |

- A - CamTemp:** Camera temperature in Celsius. Press to edit target temp.
- B - SnsTemp:** Sensor temperature in Celsius. Press to edit target temp.
- C - Fan:** Displays fan speed as a percentage of total power.
- D - TE%:** Displays sensor cooler power.

#### V16 Video Output Parameters\*

| ■ LOOP      | L REC1   |
|-------------|----------|
| ISO: 1600   | WB: 3200 |
| Gamma: 2.20 | CC: 14   |
| 10144f      | 33.8s    |

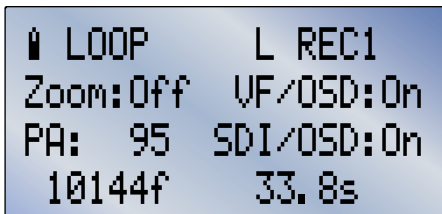
- A - ISO:** Adjusts the sensitivity of the camera. This setting affects the video output and is recorded as metadata with the clip (when recording raw images).
- B - Gamma:** Adjusts gamma from a range of 1.0 to 4.0. The default is 2.2.
- C - WB:** Adjusts white balance in degrees Kelvin. This setting affects the blue-red axis of white balance only. This value will update automatically when performing an auto white balance.
- D - CC:** Adjusts the green-magenta axis of white balance. The color compensation value will update automatically when performing an auto white balance.

\* Only for Miro, v1610, v1210, and Flex 4K

### 3 Record Mode

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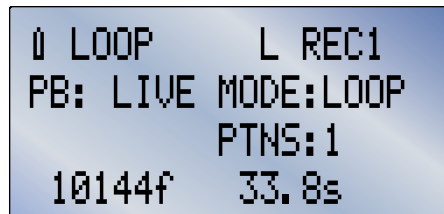
#### Video Output Toggles



- A - Zoom:** Toggle video-out zoom state.
- B - PA:** Set frame lines (production area) to a percentage of frame size or to certain fixed aspect ratios.
- C - VF/OSD:** Toggle On Screen Display for viewfinder.\*
- D - SDI/OSD:** Toggle On Screen Display for SDI output.

\* **Note:** For LC cameras (with a built-in LCD screen), **C** will toggle between SDI, LCD, and Off.

#### Other Parameters

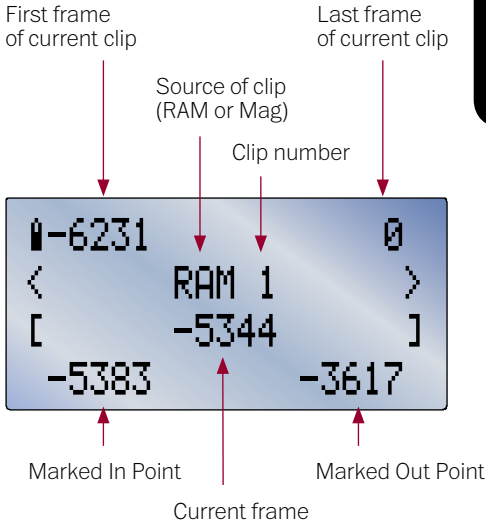


- A - PB:** Toggle between Playback Mode and Record Mode.
- C - Mode:** Toggle between four record modes
  - **LOOP** Records continuously to RAM, replacing old frames with new ones as memory is filled.

**TRIG** interrupts the loop, based on your trigger point (see page -- to see how to check your setting).
- **R/S (RUN/STOP)**  
Records directly to a CineMag.  
**REC** begins recording, and **TRIG** stops recording.
- **A.PL/R (AUTO-PLAY & RECORD)**  
Records in Loop Mode.  
Auto-plays each clip once after trigger. Automatically returns to Record Mode and erases the clip. Applicable when using an external recorder.
- **CONT (CONTINUOUS RECORD TO MAG)**  
Records in Loop Mode.  
Auto-saves each clip to the CineMag. Automatically returns to Record Mode and erases the clip from RAM.
- D - PTNS:** Hold to partition RAM.  
Partitioning RAM will instantly erase any clips currently in RAM.

# 4 Playback Mode

To review or save footage, enter Playback Mode by toggling the 'PB' parameter (A) from LIVE to PLAY. If the camera is already playing back but the playback controls aren't visible on the PCU2, press CTL (B).



Once in Playback Mode, the first and last frames of the current clip are displayed on the top line. Marked frames appear on the bottom line.

# 4 Playback Mode

## Playback Control

Clips can be played back from RAM or from a CineMag. Clips in RAM can be trimmed and saved to a CineMag.

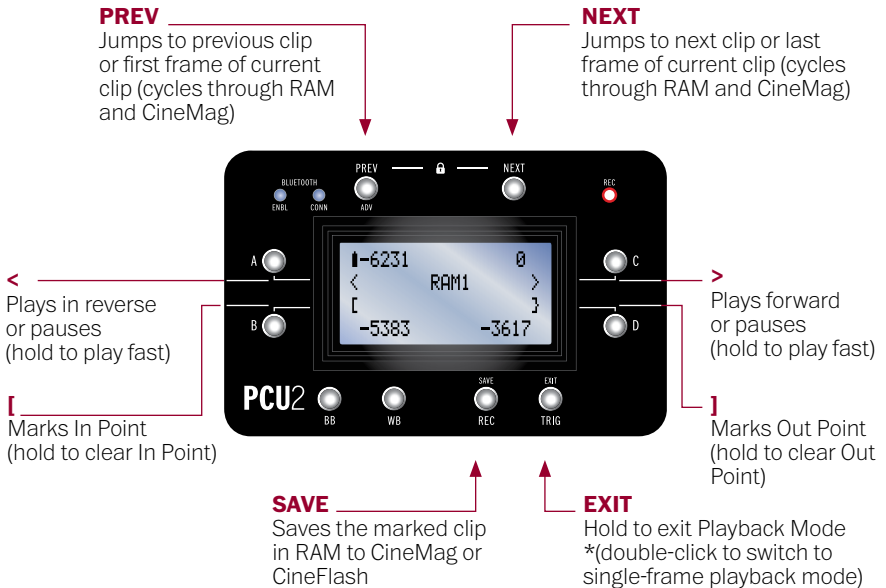
### \*Single-Frame Playback Mode

**A** = -1 (Moves video backward by one frame. Hold to play backwards at half speed.),

**C** = +1 (Moves video forward by one frame. Hold to play at half speed.),

**Exit** = Hold to exit playback mode. Double-click to enter/exit single-frame playback mode.

**Note:** With cameras set to record and play simultaneously, the playback controls will always need to be manually selected with the CTL option. Likewise, exiting the controls will not exit Playback Mode – this must be done by switching from PLAY to LIVE (see page 14).



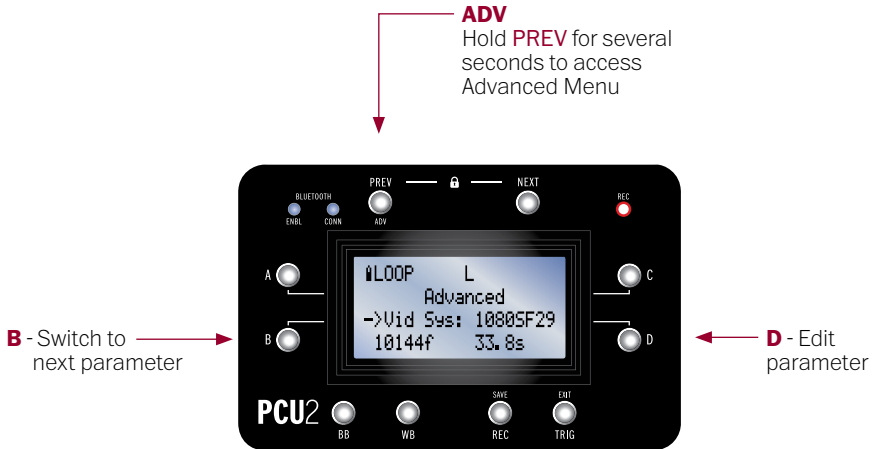


# 5 Advanced Menu

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Parameters that need to be changed less frequently are accessible in the Advanced Menu.

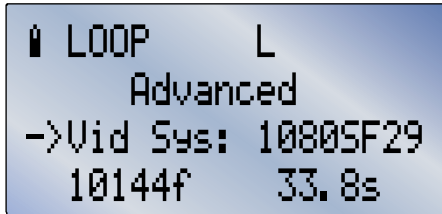
**Note:** Only parameters that pertain to the currently used camera model will be visible in the Advanced Menu.



## 5 Advanced Menu

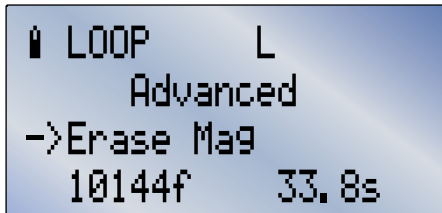
### Parameters in the Advanced Menu

#### Video System



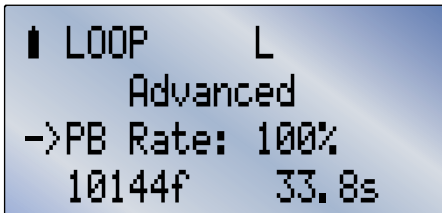
Press **D** to toggle through all video output formats supported by the Phantom.

#### Erase Mag/Storage



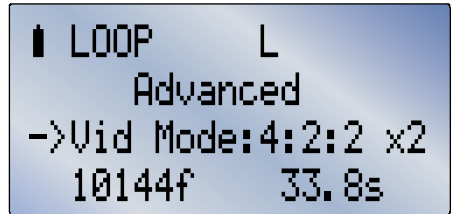
Hold **D** for five seconds to initiate CineMag/CineFlash erasure.

#### Playback Rate



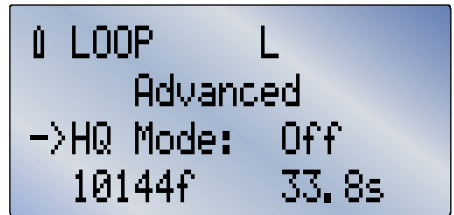
The Phantom will normally play at the video system frame rate. Change the playback rate with **C** and **D**. This setting is persistent over power cycles.

#### Video Mode



For cameras with two SDI outputs, Press **D** to toggle between video modes: 4:2:2, dual-link 4:4:4, and 4:2:2 with simultaneous live and playback.

#### HQ Mode (for Flex 2K only)

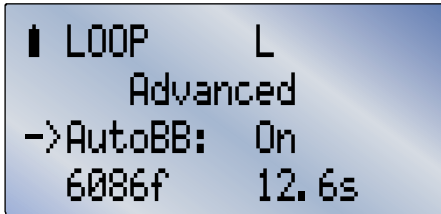


Press **D** to toggle HQ mode.

## 5 Advanced Menu

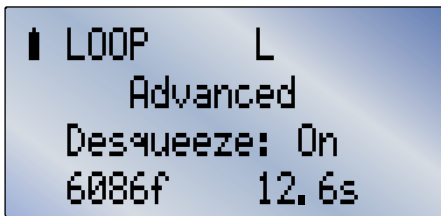
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### Auto BB (Automatic Black Balance)



Press **D** to toggle Auto BB. Only for cameras with a built-in capping shutter. PCU2 initiates a black balance when a change in parameter requires it. This setting is persistent over power cycles.

### Desqueeze



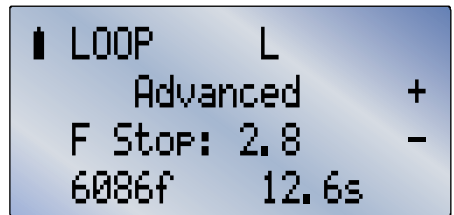
Press **D** to toggle Desqueeze. On supported cameras, this corrects the video output when the camera is used with 2:1 anamorphic lenses.

### iload (reset cam)



Press **D** to load camera's factory settings.

### F Stop

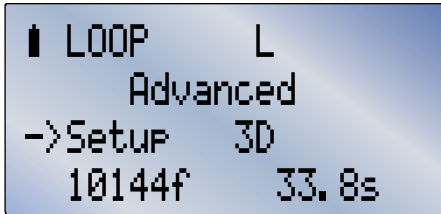


When a camera has a lens mount and lens that support electronic control of the f-stop (such as the Canon EF mount), the aperture can be increased or decreased by pressing **C** and **D**.

## 6 3D Control

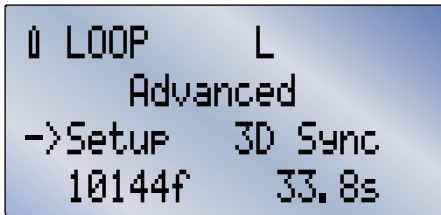
When two cameras are connected, the PCU2 always sends all commands to both cameras, enabling synchronized stereo recording and playback. There are two additional functions in the Advanced Menu for setting up and breaking down dual camera synchronization.

### Setup 3D



Pressing **D** enables external frame sync on one camera, genlock on both (if available), and copies all camera settings from camera

### Disable 3D Sync



Pressing **D** sets frame sync to internal and disables genlock on both cameras.



**Note:** For guaranteed matching in and out points, we recommend using a trigger hard-wired to the trigger ports of each camera. For proper sync, FSYNC must be connected between the two cameras, and a connection should be made between Timecode Out of one camera and Timecode In on the other.

## 7 Wireless Operation

The PCU2 can wirelessly control a Phantom camera from a distance of up to 100 meters when used with a Vision Research Bluetooth dongle.

### BLUETOOTH ENABLED LED

Illuminates when Bluetooth is enabled. When Bluetooth is enabled, wired operation is not possible.

### BLUETOOTH CONNECTED LED

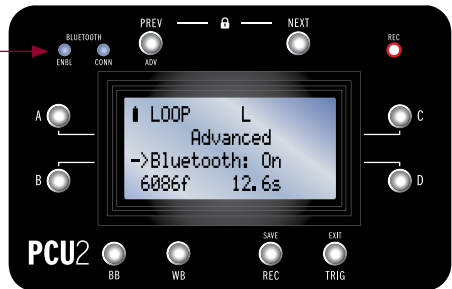
Illuminates when there is an active connection between the PCU2 and the Bluetooth Dongle.



To enable Bluetooth, go to the 'Bluetooth' page of the Advanced menu. The blue LED labeled **ENBL** will illuminate to indicate that Bluetooth is turned on.

Press **D** to toggle Bluetooth. When Bluetooth is enabled, the wired camera connection is disabled.

Make sure the antenna is screwed on and internal battery is charged. When the PCU2 is not powered from a cable, the internal battery will provide power for up to four continuous hours on a full charge (see page 24).



# 7 Wireless Operation

## BT: Not Paired

```
  | LOOP      L
    Advanced
->BT:Not Paired
  6086f      12.6s
```

Hold **D** for 5 seconds to begin searching for cameras within range.

**Note:** The name shown for each camera is the MAC address printed on the side of the Bluetooth dongle. Technically the PCU2 pairs with the dongle, not the camera.

## BT: Pairing

```
  | LOOP      L
    Search for BT in:
    Searching...
  6086f      12.6s
```

The PCU2 will remember the most recently paired dongle and will automatically connect when it is within range. If you need to connect to a different dongle, establish a link in the next page.

```
  | LOOP      L
X  SELECT 1 OF 2 NXT
   0001950B3AEB  CON
  6086f      12.6s
```

After several seconds of searching, a connection screen will appear showing the first camera found (if any). If more than one camera is found, press **C** to see the next camera.

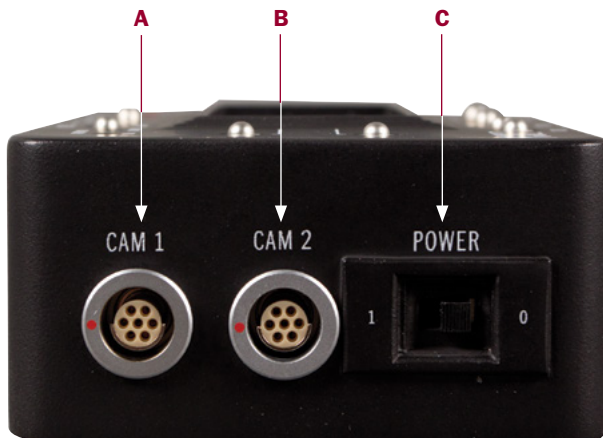
## BT: Paired

```
  | LOOP      L
    Advanced
->BT:0001950B3AEB
  6086f      12.6s
```

To pair the PCU with the camera shown, press **D**. To exit without pairing, press **B**.

## 8 Connectors and Battery

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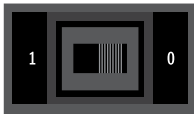


### A CAM 1

A single camera is connected to the CAM1 port. The PCU receives power from the camera.

### B CAM 2

In 3D use, the master camera should be connected to CAM1 and the slave camera should be connected to CAM2. All commands will be sent simultaneously to both cameras.



### C Power Switch

Turns PCU2 on and off. When the PCU2 is not on a wired connection, turn the PCU off whenever possible in order to conserve the battery charge.



### D Battery Charger Port

This connection is only for charging the included internal Lithium Ion battery. To charge the included battery, **ONLY** use the charger provided with the PCU2. **[If you replace the included battery with a different kind, do NOT use this port as it will create a fire hazard].** The internal rechargeable battery allows for over 4 hours of continuous wireless operation.



### E Update

Firmware updates can be sent through the mini-USB-compatible port. The PCU2 can be powered through this connection as well.



### F Antenna

For Bluetooth. When using a wired connection, this antenna may be removed by unscrewing it.



# 9 Specifications and Maintenance

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## Maintenance

To be notified of necessary firmware updates, please register your PCU2 at [www.abelcine.com/r/pcu2-registration](http://www.abelcine.com/r/pcu2-registration).

There are no user serviceable parts in this device. Avoid moisture and exposure to extreme temperatures. To clean the enclosure, do not use chemicals or alcohol, as it will strip the paint. Carefully spot clean with warm soapy water, only as necessary.

## Specifications

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|                             |  |
|-----------------------------|--|
| <b>Operating Conditions</b> | 32° - 104°F<br>0 - 85 % Relative humidity  |
| <b>Weight</b>               | 11.21 oz   |
| <b>Dimensions</b>           | 5.19 x 3.1 x 1.82 inches (w/o antenna)   |
| <b>Bluetooth Range</b>      | 100m (unobstructed)  |
| <b>Bluetooth Frequency</b>  | 2.4 GHz  |
| <b>FCC ID of Radio</b>      | The FCC ID of the bluetooth module is: T9JRN41-3<br>The IC (Canada) ID is: 6514A-RN413 |

The PCU2 is currently in the process of obtaining CE and FCC certification.

# 10 Warnings

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When using this device, basic precautions should always be followed, including:

- 1 Read all instructions before using the PCU2.
- 2 Use only with Vision Research cameras with a built-in Remote port, or with an adapter device or cable approved by AbelCine, Inc.
- 3 Use only with cables manufactured by or approved by AbelCine, Inc.
- 4 Do not use the PCU2 with a damaged cable, or connected to a damaged camera.
- 5 Do not replace the internal battery with a battery of a different type. It is recommended to buy a replacement battery directly from AbelCine, Inc. When replacing the battery please recycle the used battery according to your country or locality's rules and regulations.
- 6 Use only the battery charger included with the PCU2 or a replacement supplied or approved by AbelCine, Inc. to charge the internal battery.
- 7 Do not open the PCU2 - there are no user-serviceable parts inside.
- 8 To reduce the risk of damaging the PCU2, never short or reverse the leads or connectors of the internal battery.
- 9 To reduce the risk of electrical shock, do not use the PCU2 when wet.

# 11 Warranty

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AbelCine warrants the PCU2 to be free of defects in materials and workmanship for a period of one year from the date of purchase.

**This warranty does NOT cover:**

- Damage or malfunction resulting from accident, misuse, abuse or neglect
- Failure to follow the supplied instructions
- Repair or attempted repair by a third party
- Adjustment, disassembly or modification of the unit

In case of a warranty claim, contact the AbelCine service department  
888.223.1599 or [service@abelcine.com](mailto:service@abelcine.com).



[www.abelcine.com](http://www.abelcine.com)