



**RadioPopper P1 Radio Wireless
Owners Manual**

RadioPopper is owned and manufactured by Leap Devices, LLC in Phoenix Arizona. This product was designed, produced, and manufactured in the USA.

FCC STATEMENT

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 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.

This equipment has been verified to comply with the limits for a class B computing device, pursuant to FCC Rules. Operation with non-approved equipment is likely to result in interference to radio and TV reception.

The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

FCC ID: V4TRPP1TX770US

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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Introduction

Thank you for your purchase of the RadioPopper P1 wireless radio system. We hope you'll find this system to be a valuable tool in your creative lighting, giving you flexibility and control never before possible.

The RadioPopper P1 system allows you to use the automatic and high-speed sync functions built into your existing flash units without concern of whether or not the master and slave units can "see" each other. You now have the ability to place your lights wherever you choose, then controlling the output power of each slave flash from the camera body manually or automatically via your camera's ETTL or iTTL logic system. It's also the world's first product to effectively provide you high speed sync by radio. Enjoy.

Please read this short manual entirely before installing or operating your RadioPopper P1 wireless system. Proper installation is key to correct operation.

If you have any troubles along the way, feel free to call or email.

How It Works

The RadioPopper P1 system is beautifully simple. Quickly mount the P1 Transmitter to your Master flash, a P1 Receiver to each slave flash, and your current master and slave wireless flash system continues to function just as it always has, minus the line of sight limitation.

The RadioPopper P1 Transmitter "listens" to the light signal being created inside the master flash unit or remote commander on your camera's hot shoe. The P1 Transmitter sends this signal by radio where it is read by the RadioPopper P1 Receiver. The receiver then uses its own internal light source to "reproduce" this light signal. The light is sent down the flexible fiber optic cable where it lights a small nylon bead at the end. When this bead is placed over the infrared sensor on a slave flash, that slave flash responds to the "reproduced" light signal just as it normally would had it seen the light directly from the master flash.

Installation is easy. Just place the RadioPopper P1 Transmitter on top of your master flash or IR commander device using the included Velcro pads. "Look Ma! No wires!"

On the receiving end, add a P1 Receiver in a similar way, anchor the optic bead over the infrared sensor on your slave flash and you're all done. No wires or adaptors and no complicated system to re-learn.

Now just power up and shoot. You've got remote control of your slave flashes, full ETTL and iTTL support along with high speed sync all the way to 1/8000, by radio.

RadioPopper P1 Radio Wireless System

Compatible Hardware:

The P1 System has been tested and found to be compatible with the following flash hardware. See our website for updates as we test and certify compatibility with additional hardware.

Canon Master / Commander Devices:

SpeedLite 550EX⁽¹⁾, SpeedLite 580EX, SpeedLite 580EX II, SpeedLite Transmitter ST-E2

Canon Slave / Remote Devices:

SpeedLites 420EX, 430EX, 550EX, 580EX, 580 EX II

Nikon Master / Commander Devices:

SB-800 AF Speedlight, SU-800 Wireless Speedlight Commander, Nikon “pop-up” flash used as a Commander⁽²⁾

Nikon Slave / Remote Devices:

SB-800 AF Speedlight, SB-600 AF Speedlight

Note(1): 550EX when used as a Master device must be set to E TTL channel 4 for greatest reliability, and E TTL channel 3 as an alternate. 550EX will not properly activate the radio system when set to E TTL channels 1 or 2. 550EX when used as a Slave device will operate on any E TTL channel.

Note(2): The P1 system was never designed to work with the so called “pop-up” flash on some Nikon cameras, but it does indeed function and activate. Mounting is somewhat “improvised” at the user’s discretion. A mount may be available in the future. Improvised mounting should attempt to place the external pickup sensor directly behind the flash tube inside the pop-up flash.

Specifications:

Both P1 Transmitter and P1 Receiver have similar specifications as follows.

Dimensions : 2.75” x 2.0” x 0.8” (70mm x 50mm x 20mm)

Weight: 2.5 ounces / 70 grams (Including battery and antenna during normal operation)

Battery: “AA” Size Standard Battery / Alkaline, NiCad, or NiMH / 0.9 volt to 1.6 volt

Battery Life: Up to 10 Hours continual active transmit time for Std Alkaline battery. Longer with NiCad and NiMH.

Radio Frequency: 916 Mhz, ISM Band

Radio Range: 100 ft to 300 ft depending on conditions and environment⁽³⁾

Note(3): Please refer to the section “Maximizing Radio Performance” (Pg. 22) in this manual for more information.

Specifications and Warnings

WARNING!!! WARNING!!! WARNING!!!!

PLEASE read this section in detail for important warnings and notices.

USE ONLY THE SUPPLIED TRANSMITTER ANTENNA!

Using any antenna other than the one supplied for use with your P1 Transmitter is a violation of Federal Law and may actually cause damage to the radio inside the transmitter. This will also promptly void your warranty. Your P1 Transmitter has been carefully tuned to broadcast the maximum signal strength allowable by law. Altering the antenna characteristics is more likely to “de-tune” or degrade performance than to improve it.

INSERT THE BATTERY IN THE CORRECT DIRECTION!

Inserting the battery “backwards” could possibly damage the electronic components inside P1 Transmitter and P1 Receiver units. The little “bump” on the AA always points away from the spring. A graphic is provided at the base of the AA battery holder, as well as on the back side of the circuit board for reference. Further, you should observe for the Green Power LED blinking a few times about three seconds after you insert the battery - indicating proper insertion.

DO NOT REMOVE OR TAMPER WITH THE CIRCUIT BOARD!

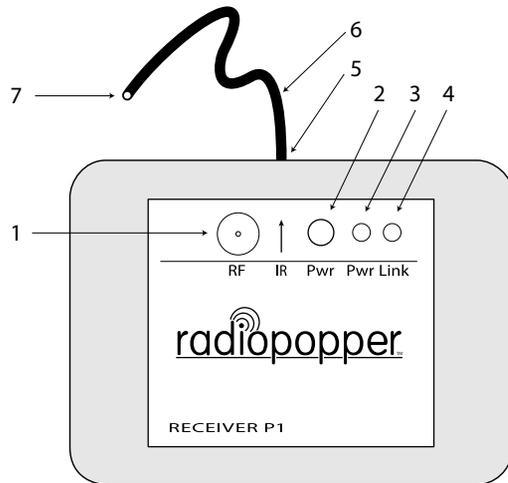
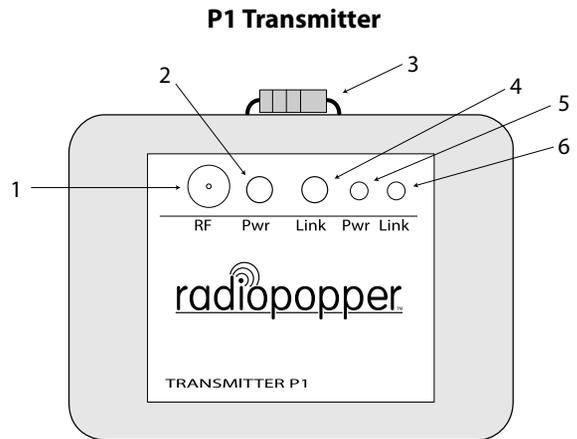
The delicate components on the circuit board are face-down for a reason. Some of the components inside your P1 Transmitters and P1 Receivers are especially susceptible to electrostatic shock (they’re easily ‘zapped’ by static electricity) - just touching them could damage them. Your circuit board is grounded to the case - as long as it’s not removed everything is safe. Breaking the glue seal and removing or tampering with your circuit board will promptly void your warranty.

YOUR POPPERS CAN’T SWIM!! KEEP THEM DRY!!

Of particular concern is the opening around the Power Button and Link Button. If you dunk them, it may be too late. If you’re caught outside in the rain, take care to keep these openings dry, as well as the access on the P1 Transmitter for the magnetic sensor in front. Should you expose a RadioPopper to anything wet, remove the battery as quickly as possible and allow it 24 hours to dry. You may find it has come back to life. Allowing anything wet inside the case of your P1 Transmitter or P1 Receiver will promptly void the warranty.

CONTACT US IF YOU GET CONFUSED!

You’re a valued customer and we really do care about you. (And not in that automated “your call is very important to us but we’re going to leave you on hold for an hour anyway” customer service recording sort of way). Seriously, if you’ve got questions, we’re going to do everything possible to take care of you as quickly and as personally as possible. The phone number is on our website and you can always email us at support@radiopopper.com



P1 Receiver

Transmitter Parts

- 1) Antenna Mount
- 2) Power Button
- 3) Magnetic / Inductive / Magic Signal Pickup Sensor
- 4) Link Button
- 5) Power LED (Green)
- 6) Link LED (Orange)

Receiver Parts

- 1) Antenna Mount
- 2) Power Button
- 3) Power LED (Green)
- 4) Link LED (Orange)
- 5) Holding Sleeve Opening for Optic
- 6) Fiber Optic Light Conduit
- 7) White Nylon Bead

Also Included in Kit or as Accessories (Not Pictured)

- 1) Your first set of AA Batteries
- 2) Industrial strength genuine Velcro fasteners
- 3) Alcohol swab(s) for prep and clean of attachment points
- 4) This instruction manual
- 5) There **may** be included release notes if applicable
- 6) Antenna for Transmitter (the straight one)
- 7) Antenna for Receiver (the one with the 90 degree bend)
- 8) Extended range Dipole Antenna for Receiver (available accessory)

RadioPopper P1 Radio Wireless System

Installation: RadioPopper P1 Transmitter

- 1) Remove the two phillips screws in the under side of the P1 Transmitter unit.
- 2) Remove the cover and insert one (1) AA size battery into the battery holder. It is very important to follow the polarity direction indicated on the circuit board to ensure unit operation and avoid possible transmitter damage.
- 3) About three seconds after inserting the AA battery the Power light will blink briefly indicating proper battery placement and that the unit is functioning correctly.
- 4) Replace the rear cover and screws, taking care not to over-tighten or strip the screw sockets.
- 5) Select the approximate mounting location on top of your Master Flash or IR Commander (supplied by your camera manufacturer). Ensure this area is clean. Use the included alcohol swab to clean this area, as well as the under side of the P1 Transmitter unit.
- 6) Attach the Velcro pieces together. Remove both backing sheets and affix the joined Velcro strips first to the under side center of the P1 Transmitter unit. We recommend placing the “rough” hook side of the Velcro against the transmitter, and the soft side of the Velcro against your flash or IR commander.
- 7) Hold the P1 Transmitter with Velcro attached over the approximate mounting location on the intended Master flash unit. Compare location to the picture in **Fig 2.1**. Press down firmly and hold pressure for thirty seconds to tightly bond the Velcro strip adhesive to both the Master flash unit and the under side of the P1 Transmitter.
- 8) Do not pull the Velcro apart for several hours. The adhesive on the Velcro will set to full strength in 20 to 30 hours. Care should be taken during this time to avoid upsetting the bond being formed between the Velcro and plastic to ensure maximum long term adhesion.
- 9) Install the supplied antenna (the straight one) by screwing it onto the antenna connector on the face of the P1 Transmitter.

WARNING: Do not power up the P1 Transmitter without the antenna installed - doing so could damage the output stage of the radio transmitter.

WARNING: Use only the supplied antenna on the P1 Transmitter. Using any other antenna is a violation of Federal Law, and may actually cause damage to the output stage of the radio transmitter.

- 10) When mounting the P1 Transmitter in the future by pressing the Velcro pads together - a greater bond may be achieved between the Velcro hook and latch sides by pressing firmly, then applying a slight rotational force between the Master flash unit and the P1 Transmitter. This tends to “set” the Velcro pads together.
- 11) **IMPORTANT!** Be sure to adjust the Sync Interval if required. If you observe a significant number of mis-fires, adjusting the Sync Interval will likely solve the problem. See “Detailed Operating Instructions” Pg. 17, and the section “Adjusting the Sync Interval” Pg. 20 for detailed information and an explanation of the Sync Interval.

Installation

Installation: RadioPopper P1 Receiver

NOTE: When first bending the supplied fiber optic tube, you will likely hear and feel a bit of a “cracking” inside the optic. This is perfectly normal and is the result of the 48 fibers inside the optic moving against each other and breaking free of the inside of the outer coating. The fibers are not actually cracking - they are quite flexible and will not break or crack when bending.

- 1) Remove rear cover and insert battery, observing for a brief blinking of the Green Power LED, just as you did with the P1 Transmitter. Replace the rear cover being careful not to over-tighten or strip the screw sockets.
- 2) Insert the supplied optic tube into the opening on the side of the P1 Receiver. Care should be taken to do this gently. It may help to twist the tube side to side while inserting. Once inserted through the outer plastic enclosure, the optic should insert an additional half inch or so into the holder.
- 3) Select a mounting location along the side of the body of your slave flash. The optic may be routed directly, around the back side, or downward wrapped under the body just forward of the hot-shoe. See the graphics in **Fig 2-2** through **Fig 2-5** and place the white bead attached to the end of the optic tube as indicated for your model of slave flash.

NOTE: You may trim the optic if needed. Trim from the end that inserts into the P1 Receiver, and use a sharp blade or razor to cut directly through the optic and internal fibers. It is not recommended to use clippers or scissors as these may leave a burr on the outside of the optic making insertion into the P1 Receiver difficult. You may need to carefully trim away any incidental burr before you are able to cleanly insert the optic in the P1 Receiver.

- 4) Ensure the mounting area is clean. Use the included alcohol swab to clean this area, as well as the under side of the P1 Receiver unit.
- 5) Attach the Velcro pieces together. Remove both backing sheets and affix the joined Velcro strips first to the under side center of the P1 Receiver unit.
- 6) Hold the P1 Receiver with Velcro attached over the approximate mounting location on the intended Slave flash unit. Press down firmly and hold pressure for thirty seconds to tightly bond the Velcro strip adhesive to both the Slave flash unit and the under side of the P1 Receiver.
- 7) Allow the adhesive on the Velcro pads to set for 20 to 30 hours before placing significant strain on them, just as you did with the Transmitter mounting.
- 8) Install the supplied antenna (the one with the 90 degree bend) by screwing it onto the antenna connector on the face of the P1 Receiver.
- 9) Place the white nylon bead at the end of the optic tube over the infrared sensor on your slave flash as indicated by the graphics in **Fig 2-2** through **Fig 2-5** for your Slave flash model.

RadioPopper P1 Radio Wireless System

10) It is okay to bend the optic tube, but try to avoid a bend radius any tighter than the radius of a standard #2 pencil. Even if a “kink” is formed in the outer tubing, the inner fibers are not easily damaged. The fibers are made of super flexible plastic, not glass. The tube tends to hold its shape a bit.

NOTE: The large red transparent piece on the front of your flash is NOT the infrared sensor. In fact this area has nothing to do with the wireless communication system - it is simply a focus assist light. The correct sensor is a shiny dark black window on the outside of your slave flash unit.

11) Attach the nylon bead over the infrared sensor on your flash using firm mounting tape. We recommend a square of gaffer’s tape, commonly available in formulas that won’t leave a residue on your flash unit. It is recommended to completely cover the optic and sensor to allow freedom of working outdoors in direct sunlight as there’s no longer a concern of the sun “blinding” the sensor. This also results in the most secure mounting of the optic.

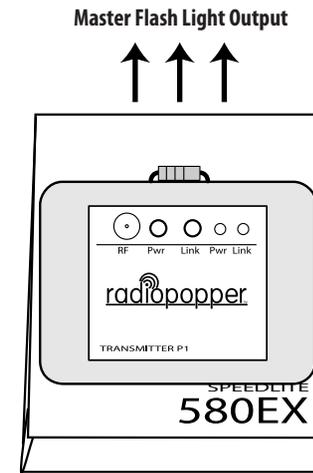
As an alternative, you may tape the black optic tube to the flash below the IR sensor, while allowing the white bead (as well as the sensor behind the bead) to remain uncovered. This will allow another photographer or assistant to also trigger this slave flash using the normal “line of sight” system if they are close to the slave, while at the same time, you may trigger this slave using the RadioPopper P1 system.

NOTE: It is okay if the slave flash “sees” the visible signal from the master flash on your camera and the signal from the RadioPopper system at the same time.

12) When mounting the P1 Receiver in the future by pressing the Velcro pads together - a much greater bond may be achieved between the Velcro hook and latch sides by pressing firmly, then applying a slight rotational force between the Slave flash unit and the P1 Receiver. This tends to “set” the Velcro pads together.

13) Take another deep breath. We’re almost there. I know the excitement is killing you. We’ve all been there. Please take a few minutes and read the rest of the manual no matter how eager you are to go play.

Installation



Transmitter Mounting on Master Flash Top View (looking down from top)

Transmitter should be just about centered on top of the master flash. The pickup sensor should point forward toward the end of the flash that emits light. The rear edge of the Transmitter should just begin to cover the text printed on the top of your flash.

Mount in a similar location for all models of Master flash (Canon 550EX, 580EX, 580EX II, and Nikon hardware SB-800 and the like).

Fig 2-1

Transmitter Mounting on Other Hardware

For mounting the P1 Transmitter on other hardware such as the Canon ST-E2 and Nikon SU-800 IR Commanders, the mounting is essentially the same. Mount the P1 Transmitter to the very top of the Master device, about centered with the magnetic pickup sensor facing forward and the antenna pointed upward.

For additional images of product mounting, please see the Support section of our website.

Canon ST-E2: We suggest mounting Velcro to the front side of the battery cover.

Nikon SU-800: Mount directly on the top edge, which is a bit rounded but with proper placement and pressure on the Velcro pads, a good anchor should be achievable.

Nikon “Pop-Up Flash”: Your P1 Transmitter was never intended to be used with a Nikon “pop-up” flash (used as a master CLS commander on some camera bodies) but it does work. Though placement is somewhat ‘improvised’, note that you should only mount your P1 transmitter behind the flash with the magnetic pickup sensor nearest the back side of the flash. You should not mount it in front of the flash where the flash is firing directly at the unit.

Fig 2-2
Canon SpeedLite 580EX II
Slave Flash Optic Placement

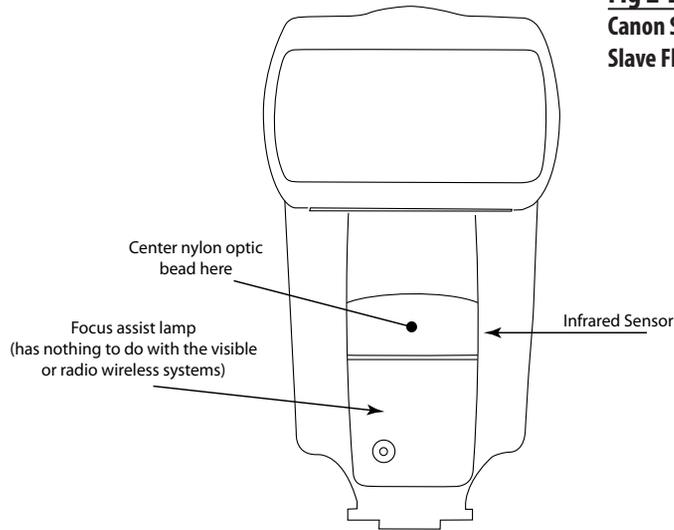


Fig 2-4
Canon SpeedLite 550EX
Slave Flash Optic Placement

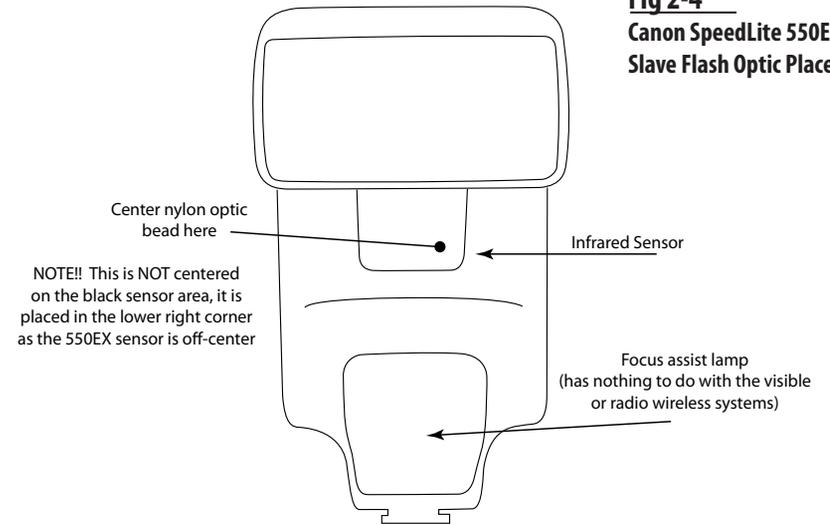


Fig 2-3
Canon SpeedLite 430EX / 580EX
Slave Flash Optic Placement

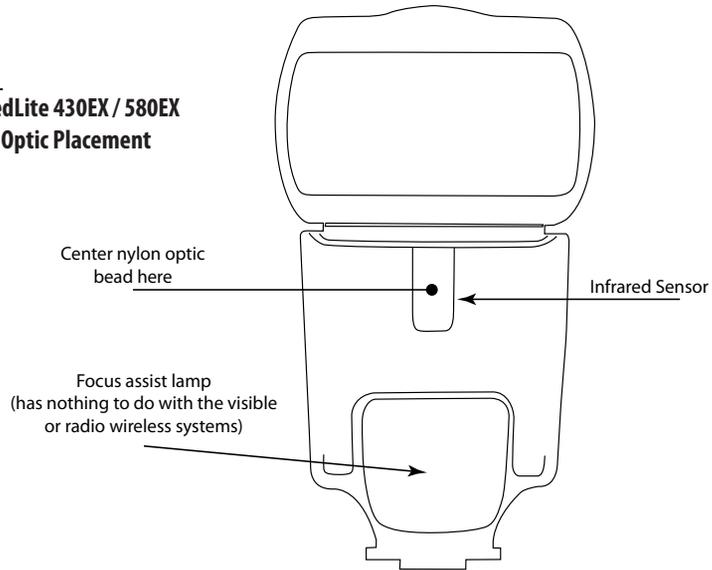
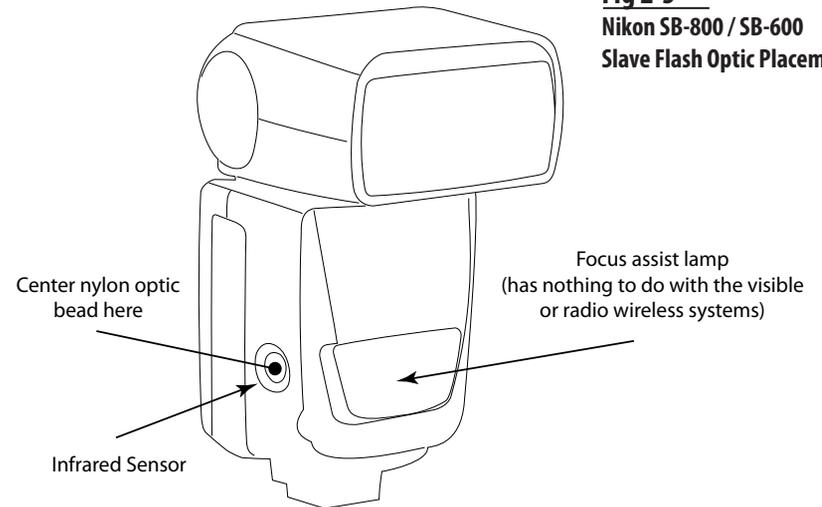


Fig 2-5
Nikon SB-800 / SB-600
Slave Flash Optic Placement



RadioPopper P1 Radio Wireless System

Operation: RadioPopper P1 Transmitter - QUICK REFERENCE

Power On / Off - Press and hold the Power Button for one second. Green LED on indicates “power on”, Green LED off indicates “power off”.

Radio Link - When the Link LED is lit, the radio is transmitting a carrier signal. All P1 Receivers should link.

Manual Radio Sleep - To ‘sleep’ the radio and stop broadcasting (to save battery or to share the frequency with a second photographer or assistant) - press the Link Button for a half second until Link LED goes out.

Manual Radio Wake - Tap the Link Button one time to re-activate the radio transmitting.

Auto Radio Sleep - After 7 minutes of inactivity (no shots taken, timer not manually reset), the radio will stop broadcasting, the Link LED will go dark and the unit will sleep.

Auto Radio Wake - If radio has begun to sleep automatically, activating your flash one time (taking a shot) or tapping the Link Button will wake the radio and resume transmitting. All P1 Receivers should re-link.

Timer Reset - Take a shot (activate the flash) or tap the Link Button to reset the 7 minute sleep timer. Link LED will strobe momentarily indicating button press.

Test Broadcast - Tap the Link Button one time, this resets the 7 minute timer and simultaneously sends a test broadcast. Any P1 Receiver within range and operating properly will blink both of its LED's together several times indicating clean reception and proper operation.

Shot Indicator - After activating the Master Flash or IR Commander (you take a shot), the Link LED will momentarily strobe indicating a signal was received by the magnetic pickup sensor.

Operation: RadioPopper P1 Receiver - QUICK REFERENCE

Power On / Off - Press and hold the Power Button for approx. one second. Green LED on indicates “power on”, Green LED off indicates “power off”.

Radio Link - The Link LED lights solid whenever the P1 Receiver is locked onto a carrier signal from a P1 Transmitter.

Radio Not Linked - Whenever the Link LED is dark, the radio link is lost, interrupted, or is out of range. The P1 Receiver will automatically search for a signal to re-acquire.

Sleep Mode - If no signal is found, the P1 Receiver alternates between sleeping and looking for a signal, blinking the Power LED on each wake cycle.

Operating Instructions

Operation: Detailed P1 Transmitter Operating Instructions

Power On / Off

Press and hold the Power Button for one second to alternate between Power On and Power Off.

Radio Link & Broadcast

The RadioPopper P1 Transmitter has been designed to conserve power, to automatically stop broadcasting when not in use, and to allow several photographers to “share” a single radio signal through a system of easily turning the radio transmitter on and off without fully powering down the entire unit.

1) When power is first turned on, the Link LED lights indicating the radio is broadcasting. The Link LED is always lit whenever the radio is broadcasting, and is dark whenever the radio is not broadcasting.

2) When in an environment with multiple photographers, only one P1 Transmitter may be broadcasting at any given time within the same general area.

Manually Sleeping the Radio

To temporarily deactivate the radio and stop broadcasting (either to save power or to allow another photographer to activate their own transmitter and control the same set of slave flashes), press and hold the Link Button for a half second to turn off the Link LED. The radio is now sleeping and will not resume broadcasting until the Link LED is pressed again. To wake the radio and resume broadcasting, tap the Link Button one time. The Link LED should light indicating the radio is again broadcasting.

Automatic Radio Sleep

The P1 Transmitter will automatically stop broadcasting and go into sleep mode if there are no shots taken, or if the Link Button is not pressed for about seven minutes. This feature insures the radio frequency will be clear for another photographer or assistant to use if the first unit becomes inactive. It also reduces power consumption if an active transmitter is forgotten about. The automatic sleep cycle may not be disabled.

Resetting Sleep Timer

The sleep timer is reset each time a shot is taken. It may also be reset manually by momentarily tapping the Link Button. This also sends a test broadcast to all actively linked P1 Receiver units.

Auto Radio Wake

If the radio went to sleep as a result of the sleep timer running out, it will automatically wake up and resume normal broadcasting if the Master flash is activated by taking a shot. The P1 Transmitter will not broadcast this first activation so slave flashes will not activate. It will however resume an active state to broadcast any follow-up shots. You may also wake the radio after entering the automatic sleep mode by tapping the Link Button one time to resume normal broadcast operation.

NOTE: It may take several seconds for sleeping P1 Receivers to come out of sleep and re-acquire the signal.

RadioPopper P1 Radio Wireless System

Timer Reset - Take a shot (activate the flash) or tap the Link Button to reset the 7 minute sleep timer. Link LED will strobe momentarily indicating button press.

Test Broadcast - Tap the Link Button one time, this resets the 7 minute timer and simultaneously sends a test broadcast. Any P1 Receiver within range and operating properly will blink both of its LED's together several times indicating clean reception and proper operation.

Shot Indicator - After activating the Master Flash or IR Commander (you take a shot), the Link LED will momentarily strobe indicating a signal was received by the magnetic pickup sensor.

Operation: Detailed P1 Receiver Operating Instructions

Power On / Off

Press and hold the Power Button for approx. one second to alternate between Power On and Power Off.

Radio Link

Each P1 Receiver will indicate it has achieved a clean radio link to an active P1 Transmitter by lighting the orange Link LED. Whenever this LED is on, there exists a clear connection between the P1 Transmitter and P1 Receiver. The instant the carrier signal from the transmitter is lost, the Link LED will go dark, and will light again the instant a signal is again locked.

You may observe the Link LED begin to strobe off and on when moving around. This is normal as any degradation of the radio signal will be visible by the Link LED strobing on and off. Once the P1 Transmitter and P1 Receiver are again stationary, the Link LED will generally stabilize.

This is also helpful for evaluating range in a given environment. As you reach the usable limits of range the Link LED will begin to strobe off and on or may go out all together. At the extremes of range you may also notice various odd behavior - both LED's may blink together (as the random clicking in and out of the radio signal may trigger the P1 Receiver to think it has received a test broadcast from the P1 Transmitter), and your Slave flash may occasionally emit pops of light.

NOTE: If your flash behaves erratically, or fails to activate after losing link or in environments with lots of background radio interference, the erratic behavior of your slave flash can often be cleared by pressing the "Pilot" button on your Master Flash or IR Commander a few times. Sending a "Pilot" signal should briefly pop all slave flashes and also seems to clear their memory of any confusion caused by random pulses of light caused by stray radio signals.

Your P1 Receiver has been designed to react to any variance in the radio signal as a communication from the P1 Transmitter, and relays any variance as a pulse of light to the attached Slave flash. This may cause some of the odd behavior above, but also makes it possible to activate the flash a certain percentage of the time even at extremely long ranges. You should not observe much odd behavior in normal shooting situations at more modest ranges.

Operating Instructions

De-Link Sleep

Your P1 Receiver will automatically link to a clean signal from a P1 Transmitter. When this signal is lost, the P1 Receiver will attempt to re-acquire a signal from a P1 Transmitter. If no signal is found for about 15 seconds, the P1 Receiver will enter a cycle of sleeping and waking, attempting to find a signal on each wake cycle.

Each time the P1 Receiver wakes to search for a signal, the Power LED will blink. If no signal is found, the P1 Receiver will go back to sleep for a short time before waking to search again. This sleep period will gradually become longer to a maximum of 3 seconds between each wake cycle.

Any time a signal is found from a P1 Transmitter, the sleep cycle is reset to its shortest duration.

The De-Link Sleep was designed to minimize battery use during periods where a P1 Transmitter may not be active, while at the same time allowing the P1 Receiver to wake back up and resume normal operation in just a few seconds when a P1 Transmitter does become active again.

NOTE: When attempting to turn off a napping P1 Receiver, the one second you press and hold the Power Button to cause the power down will not begin until the next timed "wake" cycle of the P1 Receiver - when the P1 Receiver is sleeping, it won't see your button press until its next wake cycle - you may need to hold the button longer than usual to power off the unit.

Adjusting the Sync Interval

If you are observing a significant number of mis-fires under otherwise normal conditions, you may need to adjust the sync interval for your particular hardware combination.

Before we describe how to adjust the Sync Interval, some background explanation is in order.

In order for the slave flash to respond correctly to the “reproduced” light signal from the P1 Receiver, the timing of the reproduced signal must be exceptionally accurate. To insure the original signal and the reproduced signal match perfectly, the timing circuitry inside the P1 Receivers must be exactly synchronized to that of the P1 Transmitter. These clocks must remain synchronized to about a millionth of a second at all times.

To accomplish this, the P1 Transmitter sends out a timing marker in the form of a carrier signal at a particular interval and all active P1 Receivers use this signal to maintain their timing synchronized to that of the transmitter.

It is important that the timing of this marker signal be adjusted so that it does not conflict with the timing of the light pulses emitted by your Master Flash or IR Commander. Your P1 system may require a quick and painless adjustment to this timing during first use, or if you make any major changes to your gear.

The timing of the light pulses created by your Master Flash or IR Commander are determined by a combination of what type of camera body you’re using along with what device you’re using as your Master Flash or IR Commander on the hot shoe. Because this can vary somewhat depending on your particular hardware setup, you have the ability to adjust this timing interval to solve any conflict that may exist.

How do I know if the Sync Interval needs adjusting?

The sync interval may be adjusted to a setting of 1 to 10. Your P1 Transmitter ships on setting “10” which is compatible with most hardware configurations. If your slave flash is being activated correctly by radio, you likely will not need to adjust this setting.

Indicating an adjustment is required - when taking a shot, you will see your slave flash emit a brief burst of light, but no flash will be visible in your actual exposure. What you are seeing is your slave flash emitting a pre-flash but no main flash. If you observe this behavior in a majority of your shots - adjusting the Sync Interval will likely solve the problem.

You may need to re-adjust this interval if you go to a different class of camera body, a different brand, or if you begin using complex grouping configurations (you’re using A, B, and C flash groups with ratios for example).

With any given mix of camera body and slave flash hardware, there will likely be several Sync Interval settings that will not work and several that will. In any case, you should be able to find at least one setting that works reliably for your hardware through some trial and error during initial setup.

Adjusting the Sync Interval - Instructions

If your P1 system appears to be operating correctly - you’re getting reliable triggering of slave flashes and you see the flash adding light to your actual exposures, then you should NOT make any change to the Sync Interval.

The Sync Interval may be adjusted to a setting between “1” and “10”. Your P1 Transmitter ships on a default setting of “10” which is compatible with most hardware.

Starting Adjustment

Press and hold both Power Button and Link Button on your P1 Transmitter at the same time for approximately one second until both Power LED and Link LED strobe together. Release Power Button and Link Button.

Current Interval Display

Your P1 Transmitter will indicate the current Sync Interval by blinking the Link LED in sets corresponding to the current adjustment point. Sets of 4 blinks for example represent a Sync Interval adjustment of “4”. There is a clear pause between sets of blinks. Count the blinks to determine the current adjustment.

Increment Adjustment

To increment the current setting, press the Link Button briefly. The Power LED will light during the button press and the P1 Transmitter will increment its count. Each press of the Link Button will increment the count by one up to setting “10”, then it will loop back to setting “1”.

Lock-In New Adjustment

Once the new setting is reached, lock it in by pressing the Power Button one time. The P1 Transmitter will confirm by blinking both LED’s together a number of times corresponding to the new Sync Interval setting. The P1 Transmitter will then resume normal operation.

Resuming Normal Operation

P1 Receivers are designed to find and lock onto any Sync Interval carrier signal - they require no adjustment after changing this setting on your P1 Transmitter. They should automatically re-link to your P1 Transmitter.

Choosing a Setting

So which setting should you choose? There’s a bit of trial and error involved. Again, “10” works great for most hardware. You should sequentially increment the setting by 1 step at a time and test fire the system at each setting. You should eventually find a setting that is reliable in triggering your slave flashes.

Suggested Settings

In our testing we’ve found setting “10” (which is the default setting) works with the greatest variety of hardware. A few suggested alternates for Canon are 4 and 5, and Nikon setting 4 works well.

RadioPopper P1 Radio Wireless System

About This Section

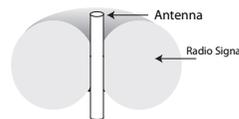
You should generally enjoy reliable and worry free operation of your RadioPopper P1 system. We have designed your P1 system using high quality components and quality engineering. When your camera manufacturer designed your existing "line of sight" wireless flash system, they never intended the signal to be relayed by radio. In fact, many engineers have considered a system such as the P1 impossible due to the extreme high speed of the signal produced by the flash system. The line of sight "conversation" between your flashes happens so quickly that it is not possible to use industry standard methods of transmitting information by radio.

It turns out it is indeed possible to transmit a signal at the required speed and to reliably activate remote flashes by radio, though it requires a perfectly tuned receiver able to lock onto a clean radio signal. This section is provided to familiarize yourself with how radio signals work, how to maximize use of your system, and how to identify situations where you may have less than ideal performance. You should not experience significant issues with your radio system that would limit the overall usefulness of the system. You may however occasionally come into contact with various situations and environments that produce unexpected behavior. This section is provided so you will understand what you are seeing in these situations and can act accordingly to minimize the impact on your picture taking experience.

Understanding Radio Signals

Your existing "line of sight" wireless flash system operates by producing an extremely fast series of "blinks" of light. These blinks of light are seen by the slave flash. Your RadioPopper P1 system transmits these "blinks" in real time by radio signal. Due to the extreme high speed of this "blink" signal, a clean radio link must be maintained between your P1 Transmitter and any P1 Receivers to transmit all of the "blinks" in perfect timing and without missing any blinks along the way. Understanding how the radio signal moves through space and possible sources of radio interference will help you maximize the range, reliability, and overall performance of your P1 system.

The radio signal emits outward in the shape of a doughnut from the sides of the antenna. The signal is therefore strongest 360 degrees to the sides of the antenna when the antenna is pointed straight up. The weakest signal is emitted out the very point of the antenna, as well as straight downward out the bottom of the antenna.



When the signal is emitted - it will continue long distances in a straight line outward from the antenna. Anything placed between the transmitter and receiver will reduce the range and strength of the signal. When the signal hits a metal surface, the surface tends to reflect the signal in new directions.

Ideal Conditions

In open air free space you can expect operation out to about 300 ft. This assumes the use of the standard (included) receiver antenna, and assumes no obstacles are present between the P1 Transmitter antenna and the antenna on the P1 Receiver. This also assumes that both antennas are pointed straight upward and there is no radio interference present.

This ideal condition range is reduced as objects are placed between the P1 Transmitter and any P1 Receivers.

Maximizing Radio Performance

Normal Conditions

Under normal conditions where your slave flashes are placed within 50 feet or so of the master, you should generally observe reliable and worry free operation regardless of placement or orientation. In these "normal" situations it is not necessary to pay much attention to the direction the antennas are pointing, environment, or obstacles.

In most cases it is okay to point the flash head of your master upward for bounce or when using certain types of lighting modifiers, as well as pointing the antenna to the side during vertical picture taking. The radio signal is usually sufficiently strong at these closer ranges and most environments have enough objects and walls present to help the signal reflect around in every direction to allow for worry free operation.

When using your system indoors, you can usually get away with placing more obstacles between the units as the radio signal tends to "reflect" around the inside of a building. The signal will generally reflect from anything metallic such as structures and wiring inside walls of buildings. This "reflected" signal will tend to wrap around groups of people, walls, and down hallways.

You may however occasionally notice signal is lost or your slave flash fails to operate reliably in situations where the transmitter antenna is not pointed upright depending on your shooting environment and depending on the placement of your slave flashes. Sometimes in vertical picture taking or with the master flash head pointed upward, the transmitter radio signal must go through your camera or your body to reach the slave which may reduce range. This generally happens in large open spaces or when the slaves are placed a greater distance from the master.

When using your system outdoors, some care must be taken in the placement of slave flashes. The radio signal is impeded by dense materials such as concrete, masonry, brick, tile, etc., as well as objects with lots of water - such as planters, dense brush, large trees, and groups of people.

It is usually possible to activate your slave flashes through windows and exterior walls with reduced range. Some exterior walls may be too dense to allow a clean transmission of the radio signal, and many windows are treated with metallic films which may reduce or block the radio signal.

In many cases, using the optional Dipole antenna on your receiver will help increase reliability in the above situations by making the P1 Receiver more sensitive to the radio signal.

Radio Interference

Your P1 Transmitter uses a frequency not used by many other devices (it is safely outside the band of 900mhz cordless phones and cell phones for example). However, most environments do have a certain amount of background radio interference - usually emitted by other electrical devices present in the environment. ALL electric devices emit some radio signals on certain frequencies. You may encounter various types of radio interference in the operation of your P1 System depending on your shooting environments. Recognizing and avoiding interference will help minimize the disruption to your picture taking and maximize the usefulness of your P1 system.

RadioPopper P1 Radio Wireless System

Identifying Radio Interference

When a clean link is established between a P1 Transmitter and a P1 Receiver, the P1 Receiver will turn on the orange Link LED. Any time this signal is lost, interrupted, or other unexpected signals cause a conflict with the signal the receiver is expecting to see - the Link LED will go out. The Link LED will turn back on as soon as the P1 Receiver is able to make out the correct signal through the “noise” of the interfering signal.

In the presence of interference you may observe the Link LED on the P1 Receiver is not solid - it may be flickering or strobing, even when in close range of the P1 Transmitter. In this condition, you may have intermittent interruption in the operation of your P1 system.

You may also observe erratic operation of your slave flash. Any conflicting background signal is reproduced as short blinks of the light source inside your P1 Receiver, which are seen by the sensor of your slave flash. In most cases, these erratic blinks don't match any timing your slave flash is programmed to respond to so they are disregarded. In some cases, the random timing of these blinks may exactly match an instruction your slave is programmed to. In this case it may emit short pops of light or perform other erratic behavior.

Once you have identified an issue of interference, repositioning the slave flashes may correct the problem. In many cases, your P1 system will still operate in the presence of interference to a satisfactory level as to allow continued use without changing location. In other cases moving just a few feet may be enough to get away from the interference.

Sources of Intentional Radio Signals

Some electronics intentionally emit radio signals. Your P1 Transmitter uses the United States certified “Industrial, Scientific, and Medical” or “ISM” band as that is the only band the FCC will allow the type of broadcast required to make this system possible. This band is quite wide with lots of frequencies available so other devices with the exact frequency as your P1 should be rare, but you may occasionally shoot at locations with conflicting radio signals.

Common sources are monitoring and environmental control equipment - such as security systems and air conditioning and heating control systems. These systems may emit a strong signal and may conflict with your P1 system as far as 200 ft. away from the emitting source. Some locations may have many such transmitters throughout the property which may prevent reliable operation anywhere at the venue. The good news is these more powerful sources of interference are very rare and not likely to reduce the usefulness of your P1 system at multiple locations.

Sources of Unintentional Radio Signals

All electrical devices emit radio signals. These signals are usually very low power and won't interfere with other electronics. As electric devices age and begin to fail, they often begin emitting various interference. Your P1 Receiver is tuned to be exceptionally sensitive to changes in radio frequency which allow it to repeat the signal between your flashes at such an incredibly fast speed. This does also make them sensitive to certain background radio interference.

Sources of unintentional radio signals are fairly common. The most common source of signals likely to effect your P1 Receiver are failing fluorescent lights (lights operating normally pose no concern of interference), and failing computer and TV monitors. Though this type of interference is fairly common, these signals usually have very short range, and moving your shooting location just a few feet may be enough to get you away from the interference.

Trouble Shooting

About This Section

We have put much consideration into the design and operation of the P1 system. We are confident you will experience simple and worry free operation. Please refer to this section if you do experience any trouble while operating your P1's. This section is split into three segments focused on the types of mis-fire or malfunction issues you are likely to encounter.

How E TTL and iTTL Work

As the RadioPopper system is simply a “relay” for an existing signal being sent between your Master and Slave flashes, it is important to understand how the existing system works. Some of the misfire events or malfunctions you may experience are directly attributable to the underlying E TTL / iTTL system built into the flashes themselves, rather than the P1 radio system.

Your E TTL / iTTL system works by causing the wireless Slave flash to emit two separate bursts of light. The first burst, called a “pre-flash”, is a dim flash of a known amount of light. Before your camera's shutter opens, your camera's metering system measures this first “pre-flash” and based upon it, calculates the correct amount of light needed to properly expose your image. Your camera then opens the shutter and commands the wireless Slave flash to emit the second burst, the “Main Flash” that actually exposes your image.

Pre-Flash with no Main-Flash

One of the most common mis-fire events you are likely to observe is the wireless Slave flash emitting a short “pre-flash”, but you see no flash contributing to your actual exposure when looking at the picture in your camera's display. It may appear your flash is “firing”, but you don't see any flash in your exposed image. This type of mis-fire may be caused by a combination of several factors and will likely occur in a certain percentage of exposures.

NOTE: If you are using high speed sync, please refer ahead to the High Speed Sync note on Page 29.

NOTE: This type of mis-fire will only happen if you are actually using the E TTL or iTTL function of your camera (the “automatic flash” mode). Some camera bodies, Master Flash devices or IR Controller devices allow you to remotely adjust the power of your wireless slave flashes manually. In this case they fire at the prescribed power level with each shot without performing a “pre-flash”. You may find greatest system reliability especially at longer ranges when setting your flashes to this manual mode. Please refer to your camera and flash owner's manuals as different hardware may vary regarding features for remotely setting the power level of slave flashes.

1. If you're getting a lot of these misfires (anything over 10% of your images), you should adjust the Sync Interval setting on the transmitter (Page 20). A bit of trial and error here should dramatically improve reliability.

2. In much testing of E TTL and iTTL systems *without* the P1 System installed, we've found a certain misfire rate when the Master flash is fired directly into the Slave flash at a range of a few feet. It is clear that even in the most ideal situations, a certain number of mis-fires will occur purely attributable to inconsistencies in the Master and Slave flash system itself.

RadioPopper P1 Radio Wireless System

As the RadioPopper P1 system simply repeats the signal with a high degree of accuracy, these mis-fires attributable solely to the flash system itself will still happen and are not an indication of malfunction of your P1 system.

3. Your camera's metering system must be able to observe the amount of light being emitted by the wireless Slave during the Pre-Flash. If it doesn't see this light, it will not command the flash to emit a Main Flash. If you're shooting at long ranges (and we know you'll try it - right?), remember you're shooting much beyond the range your camera's metering system was intended to be able to measure this Pre-Flash.

If you're shooting with anything other than a tight telephoto lens at these longer ranges, or if the Slave flash is hidden to such an extent that it contributes very little light, reliability will be reduced. In these situations, you should set your Slave flash to operate in Manual mode. Some Master flash devices allow you to remotely adjust the setting of the wireless Slave from the Master device. This (with most hardware) eliminates the whole pre-flash logic which should greatly improve reliability in these longer range situations.

4. Consider the Recycle Time of your remote flashes. When shooting wireless, you tend to shoot faster than usual without waiting for a full recycle. You probably also have that flash placed some distance away from the subject which means it's firing at a higher power, causing further delay to recycle. This also applies with High Speed Sync - which tends to make your Slave flash cycle more deeply.

A flash that is not completely recycled will often still emit a pre-flash but won't have enough 'charge' to fire the main flash. Also note the red blinking "beacon" light on the front of the flash (on Canon hardware) often starts blinking before the flash is actually fully recycled. You may need to wait a couple seconds after this beacon starts blinking before actually taking the next shot.

Sidenote: We HIGHLY recommend PowerEx rechargeable NiMH batteries for your flashes. They cycle way faster than anything else we've tried off the shelf, even with the external battery pack. They haven't paid us to say that, we just think they're awesome. Get them at www.mahaenergy.com.

5. Sometimes a Slave flash may get confused and stop responding correctly. No kidding. This happens without the P1 Radio system also - many people have had the experience of a Slave flash acting "funny" when using the 'line of sight' system even without the RadioPopper P1 system.

This "getting confused" seems to have more to do with the Slave flash than the P1 Radio. To "un-confuse" it, try pressing the Pilot button on the back of your Master Flash or IR Commander. This should cause all slave flashes to emit a short pop of light indicating they are alive. This also seems to "clear" any confusion. Do this Pilot operation a couple times to be sure.

6. Try changing the E TTL channel on your flashes. This sounds strange, but even before the RadioPopper system came along, many photographers have found greater reliability on certain E TTL channels. If you're using a SpeedLite 550EX as your master, set it to E TTL channel 4, or 3 as an alternate as it won't work on E TTL channels 1 or 2.

7. Check your batteries. All of them. There is no "auto cut off" when the batteries in your P1 Transmitter and P1 Receivers start to die. You will start seeing increased numbers of mis-fires when either unit begins to run low. As the drain is

Trouble Shooting

similar on both units, it's a good idea to always replace batteries in all units at the same time. Also note the battery in your Master Flash or IR Commander may be getting low.

8. Mis-fires will increase with greater range. In normal shooting situations, activation and operation should be pretty reliable. As you begin to put objects, walls, or buildings between P1 units, you will at some point notice an increase in the number of mis-fires.

9. Some mis-fires are unavoidable. Unfortunately, the flash manufacturers chose to time the visual pulses of light extremely close together. Due to the extreme speed at which the P1 system must operate, there is no time error checking or repeating of the radio signal as with other radio based flash triggering products. The P1 system reads these pulses of light and does it's best to relay them accurately and generally does a very good job of it.

No Flash at All

The second mis-fire event you may observe is the Slave flash not emitting any light at all. This is likely caused by incorrect configuration of the flash system itself (aside from the RadioPopper P1 system) or a problem with system installation.

1. Uncover the infrared sensor on your Slave flash (if you've used tape to attach the P1 Receiver optic). Power off the P1 Transmitter and Receiver and attempt to fire the Slave flash at short range using the normal line of sight system. It must operate correctly using the line of sight system at short range before it will operate using the P1 System as the P1 is simply repeating the visible signal.

See the owner's manual that came with your flash and camera body to ensure you've configured your existing hardware correctly. Check that the the flash on the hot-shoe is set to "Master" and the remote flash is set to "Slave". Also ensure the Master and Slave units are set to the same E TTL channels.

Once your flashes are operating correctly using the line of sight system, power up your P1 Transmitter and P1 Receivers and continue....

2. When the radio is activated on the P1 Transmitter (see Operating Instructions earlier in this manual), observe the Link LED (orange) is lit on the P1 Transmitter. This should also cause the Link LED to light on the P1 Receiver indicating there is a good radio link established between the two units.

If the Link LED is lit on your P1 Transmitter, but the Link LED does not light on your P1 Receiver(s), the receiver(s) may be out of range, there may exist some background radio interference in your environment preventing a good link (including another P1 Transmitter being used by another photographer near by), or one of your units may be damaged. Move to another location and try it again to eliminate the possibility of some source of radio interference operating near to you.

3. When a good link is established (the Link LED lights and remains lit solid on the P1 Receiver), tap the Link Button on the P1 Transmitter one time quickly. This should cause the Link LED on the P1 Transmitter to strobe. It will also send a test message to all active P1 Receivers. If this message is received correctly, the receiver(s) will blink both LED's together several times.

RadioPopper P1 Radio Wireless System

This indicates a good radio connection exists and the units are clearly communicating with speed and accuracy that should allow normal operation.

NOTE: Near the edge of the effective radio range for your particular environment, it is possible the Link LED may remain lit and test broadcasts produce the expected feedback while still your slave flash fails to activate. Near the edge of the radio range, some of the “blinks” of light transmitted by the P1 system may be dropped and not correctly reproduced resulting in failures to fire.

4. Install your P1 Transmitter on top of your Master Flash or IR Commander as described in the Installation Instructions section of this manual. When you take a shot, the Link LED on the P1 Transmitter should strobe briefly following the shot. This indicates the magnetic sensor on the P1 Transmitter is picking up a signal from your Master Flash or IR Commander. It does not necessarily mean the signal is complete or correct, simply that a signal is being received.

If the Link LED of the P1 Transmitter does not strobe when shooting, re-check your installation and that the batteries in your P1 Transmitter are good, as well as checking the batteries in your IR Commander.

Slightly adjust the placement of the P1 Transmitter on top of your Maser device. The magnetic sensor should be 1/2” to 1” above the plastic surface of your flash, and should be placed rear of the front edge of the flash 1/2” to 1”. Moving this sensor closer to the flash lens (where the light comes out) may actually degrade performance. The magnetic signal is strongest and most consistent a bit further back from the flash lens and a short distance above the plastic exterior of the flash.

Even if the Link LED on the P1 Transmitter does strobe after a shot, it is possible it may not be picking up the complete signal from your Master Flash or IR Commander.

5. Check the placement of the nylon bead at the end of the optic tube on the P1 Receiver. It may have slipped loose during use. We recommend securing the bead over the IR sensor of your slave flash with a square of gaffer’s tape. Your local camera dealer should stock new formulas of gaffer’s tape that won’t leave residue or marks on your flash.

Ensure the bead is placed over the infrared sensor of your flash as per the Installation Instructions in this manual. It should NOT be placed over the red plastic piece on your slave flash - this is not the infrared sensor. On the SpeedLite 550EX used as a slave note the infrared sensor is not centered on the black window, it’s in the lower right corner. See **Fig 2-4** (Pg. 15) in this manual.

6. Check the optic is inserted into the sleeve on the side of the P1 Receiver.

7. Make sure there is no excessive bend in the optic tube extending away from the P1 Receiver. A bend any tighter than what would wrap around your finger should be avoided. An excessively tight bend radius will prevent light from efficiently traveling down the length of the optic tube and may result in reduced reliability.

Trouble Shooting

Trouble Shooting other Miscellaneous Issues

High Speed Sync - “I see the flash fire, but the image is still dark.”

This may also be seen as a “pre-flash with no main flash” type of mis-fire as described above, but is not actually a mis-fire at all. When playing with High Speed Sync it must be realized that your flash produces an exponentially reduced amount of light the higher you push the shutter speed. If you’re shooting at 1/8000 (and we know you’ll try it) your flash is emitting very little light and only has an effective range (between the flash and the subject being lit by the flash) of a few feet. If you place the flash much distance from the subject or through a diffuser, you may not see the contribution of light to your image, even though it is indeed firing correctly.

Try reducing your shutter speed or getting the flash closer to the subject.

One of my P1’s has become non-responsive

You may observe a P1 unit “freeze up” and become non-responsive to button presses, won’t turn off, won’t de-link or re-link and so on. This is usually caused by a low battery. There is no “low voltage cutoff” in either unit. We’ve designed them to allow the battery to continue to drain until some part of the circuitry can no longer function to allow longest use of a battery, or to squeeze the last bit of power when you’re in a tight shooting situation and can’t replace batteries.

A new Alkaline battery (the non-rechargeable ones you get from the store) should last 5 to 10 hours of continual transmit time. Rechargeable batteries will probably go longer, but remember that rechargeable batteries tend to naturally drain and die off on their own after a couple days of non-use.

LIMITED WARRANTY

The Limited Warranty set forth below is given by Leap Devices LLC (hereafter "Leap") in the United States with respect to the RadioPopper P1 Transmitter and / or RadioPopper P1 Receiver packaged with this Limited Warranty and identified by model number within this Limited Warranty (each a "Product") when purchased and used in the United States.

This Limited Warranty is only effective upon presentation of this warranty card and proof of purchase.

A Product, when delivered to you in new condition in its original container at the point of its initial retail sale, is warranted against defects in materials or workmanship as follows: for a period of one (1) year from the date of original purchase, defective parts or a defective Product returned to Leap or its authorized service providers, and proven to be defective upon inspection, will be repaired with new or comparable rebuilt parts or exchanged for a refurbished Product, as determined by Leap or the authorized service provider, in their sole discretion. Replaced parts and exchanged Products will become the property of Leap.

When returning a Product for warranty service, the shipping charges must be prepaid and the Product should be shipped in its original container, or an equivalent, properly packaged container to withstand the hazards of shipment and fully insured. A copy of this warranty card and proof of purchase should be enclosed, as well as a description of the problem. Repairs will be made and the Product will be returned, shipped at NO CHARGE, within the country of repair. The Product must be received for warranty service by Leap before the expiration of this Limited Warranty.

This warranty only covers defective materials or workmanship encountered in normal use and service of a Product and does not apply in the following cases:

- (a) If a circuit board is removed from the plastic enclosure for any reason or if the original factory glue seal between the circuit board and plastic enclosure is disturbed in any way. Tampering with or removing the circuit board from the enclosure VOIDs this warranty.
- (b) Loss or damage due to neglect and/or abuse causing deterioration, mishandling, accident or failure to follow operating instructions including but not limited to operation of a P1 Transmitter with no antenna attached, or operation with an antenna other than that provided with the product originally, or inserting the batteries backward for any length of time.
- (c) If a Product is defective as a result of leaking batteries or damage due to water or other liquid, or any environmental conditions.
- (d) Defective materials or workmanship where the defect is due to a Product having been serviced or modified by other than Leap or a Leap authorized service provider.
- (e) Malfunction resulting from the use of accessories, attachments, supplies, parts or devices (including, without limitation, batteries) that do not conform to Leap specifications.
- (f) Damage resulting during shipment. (Claim must be presented to and examined by the shipper).
- (g) Damage or service resulting from modifications or alternations to a Product in any way (including any alteration or removal if its serial number or identification marks).

NO IMPLIED WARRANTY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, APPLIES TO A PRODUCT AFTER THE APPLICABLE PERIOD OF THE EXPRESS LIMITED WARRANTY STATED ABOVE, AND NO OTHER EXPRESS WARRANTY OR GUARANTY, EXCEPT AS MENTIONED ABOVE, GIVEN BY ANY PERSON OR ENTITY WITH RESPECT TO A PRODUCT SHALL BIND LEAP (SOME STATES AND PROVINCES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU). LEAP SHALL NOT BE LIABLE FOR LOSS OF REVENUES OR PROFITS, INCONVENIENCE, EXPENSE FOR SUBSTITUTE EQUIPMENT OR SERVICE, STORAGE CHARGES, LOSS OR CORRUPTION OF DATA, OR ANY OTHER SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, ANY LOSS OF FILM OR DIGITAL IMAGE FILES) CAUSED BY THE USE OR MISUSES OF, OR INABILITY TO USE, A PRODUCT, REGARDLESS OF THE LEGAL THEORY ON WHICH THE CLAIM IS BASED, AND EVEN IF LEAP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL RECOVERY OF ANY KIND AGAINST LEAP BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT SOLD BY LEAP AND CAUSING THE ALLGED DAMAGE. WITHOUT LIMITING THE FOREGOING, YOU ASSUME ALL RISK AND LIABILITY FOR LOSS, DAMAGE OR INJURY TO YOU AND YOUR PROPERTY AND TO OTHERS AND THEIR PROPERTY ARISING OUT OF THE USE OR MISUSE OF, OR INABILITY TO USE, THE PRODUCT NOT CAUSED SOLELY AND DIRECTLY BY THE NEGLIGENCE OF LEAP (SOME STATES AND PROVINCES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU). THIS LIMITED WARRANTY SHALL NOT EXTEND TO ANYONE OTHER THAN THE ORIGINAL PURCHASER OF A PRODUCT, OR THE PERSON FOR WHOM IT WAS PURCHASED AS A GIFT AND STATES YOUR EXCLUSIVE REMEDY.

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