COGNISYS SCOUT RECEIVER

Owner's Manual

Revision 1.2

COGNISYS INC.
Capture the Hidden World

Copyright 2018 Cognisys, Inc.

Table of Contents

Table of Figures

1. Safety Instructions

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Follow all CAUTION notices to reduce the risk of personal injury, prevent damage to the Scout equipment, accessories, and devices (computers, cameras, flashes, etc). Failure to follow all CAUTION notices may void your warranty. CAUTION may also indicate a potentially hazardous situation which, if not avoided, may result in personal injury.

The safety alert symbol ⚠ precedes a general CAUTION or WARNING statement.

The electrical hazard symbol ⚡ precedes an electric shock hazard CAUTION or WARNING statement.

⚠ **CAUTION:** Only use approved power sources for Scout equipment. Use of other power adapters or batteries may damage the controller and/or attached equipment.

⚠ **CAUTION:** Misuse of Scout equipment could potentially damage your equipment. Cognisys, Inc. will not be held liable for damage to your equipment. If you have questions about safety please contact us!

2. Getting Started

The latest version of this manual is available on our website at:
http://www.cognisys-inc.com/products/scout/scout_tech_specs.php

The graphics/menus included in this manual may not be identical to the software that you are running. Improvements and adjustments to the software may happen prior to an updated version of the manual.

Not big on reading manuals? (What? No thumbs-up? We worked hard on this you know!) We have a few real world setups in the "5 - Examples" section. You can always come back to the technical details if you get stuck. You really should finish reading this section though – it goes through battery replacement and the basic care of the Receiver.

2.1 What is the Scout Receiver?

The Scout Receiver is an ideal solution for short-term or long-term trail photography. It uses an invisible active infrared beam created by a separate transmitter. Simply: When this beam is crossed it will activate your camera.

The Scout Receiver has several features not available with many trail photography devices:
- Easy to use OLED dot matrix display
- Customizable camera control
- Directional triggering support (head photographs only please!)
- Adjustable sensitivity to prevent false activations
- Time windows of operation to only go after the subjects you're interested in
- Can limit the number of shots to reduce nuisance triggers (curious squirrels)
- Wired or wireless operation with other Scout equipment
- Weatherproof design
- Removable ¼-20 tripod mount
- Operates off of 6 AA batteries
- > 100 days of battery life
- Wide operating temperature range: -40C – 80C (-40F – 176F)

2.2 Advantages over Passive Infrared (PIR)

Passive infrared (PIR) sensors have several flaws:
- Temperature/lighting changes can cause false triggers
- Extremely wide detection range making camera placement/focus difficult
- Because of the wide detection, setting subject height is difficult
- Relatively slow response rate
- Limited range
- May require adjustment to sensitivity

The Scout Receiver system on the other hand:
- Immune to temperature/lighting changes
- Point-to-point detection allowing precise camera placement/focus
- Filtering out "nuisance" animals is easy – just adjust the height of the system
- Response times as fast as 25 milliseconds
- Range of over 120 feet / 36 meters
- Point and shoot!

2.3 What is Included

The Scout Receiver includes:

- Scout Receiver
- Camera shutter cable of choice
- 4m/13ft weatherproof cable (Scout Receiver to camera)
- Removable ¼-20 tripod mount
- Quick-start guide insert

If you purchased the Scout Receiver as a kit it may include additional accessories.

2.4 Battery Installation

Battery installation is a simple process and because the Scout Receiver has excellent battery life – you won't have to do it often!

The Receiver requires six AA (LR6) batteries. You can use either alkaline or rechargeable varieties. For details about maximizing battery life see section "5.6 - Maximum Battery Life".

1. Be sure the Receiver is clean prior to replacing the batteries otherwise dirt may compromise the weatherproof seal.
2. Remove the four screws from the back-side of the Receiver using a Philips screwdriver.
3. Remove the Receiver's back cover.
4. Install the six batteries.
5. Align and push back cover onto the Receiver.
6. Install screws being careful not to cross-thread them – do not overtighten!

You can also power the Scout Receiver with external power using the optional power cable available here:
https://www.cognisys-inc.com/store/3pin-extpwr-cable.html

You do not need to remove the internal batteries when using external power but you should remove the batteries if the Receiver will not be used for an extended period.

2.5 Quick Start Guide

Want to be up and running in two minutes or less? Here's the quick-start guide in case you misplaced it:

SCOUT Quick Start

RECEIVER

Press to turn on Scout.
Press and hold to turn off.

Enter button - Use to change settings or enter menus.

Up and Down buttons - Use for menu navigation and number entry.

TRANSMITTER

Transmit Power button - 2 levels
Press to change.

Transmit Speed button - 3 levels
Press to change.

COGNISYS INC.
Capture the Hidden World
http://www.cognisys-inc.com/products/scout

Get the owner's manual and software

SCOUT Connection Diagram

Use camera to control Flash(es)

4m Scout Cable Included

Coiled 3.5mm Shutter Cable (Included)

Getting Started:

1. Remove 4 phillips screws from the bottom of both the transmitter and receiver. Install 6 AA batteries in each.

2. Power on both the Scout Transmitter and Receiver.

3. Turn on LED Alignment - Press enter, then enter again.

4. Face the transmitter and receiver towards each other. When they are aligned the Receiver LED will flash Red.

5. The LED will turn green when the beam is interrupted and LED Alignment is on. If LED Alignment is off the LED will turn red.

6. Connect your camera as shown above.

There are many other settings and modes you can use. Be sure to check out the owner's manual for more details. As always, please let us know if you have any questions. We're glad to help!

support@cognisys-inc.com
www.cognisys-inc.com

Phone: 248-365-0052
Toll-Free: 888-746-3731

2.6 Cleaning and Care

We want your Scout equipment to last – so here are some brief steps to keep it happy!

2.6.1   Cleaning

For cleaning we recommend a slightly dampened (not wet) micro-fiber cloth. Do not spray water directly into the inside of the equipment. Any liquid that goes into the controller may cause an electrical failure of the device. Do not use a flammable liquid/solvents or cleaning agents on the controller – just a micro-fiber cloth (dampened if needed).

2.6.2   Care and storage

Scout equipment is designed to handle normal wear and tear but there are some things to avoid:

- Do not get the unit wet internally.
- If not using the external connectors be sure to attach the protective cover or water may leak into the controller causing damage.
- Do not drop the unit (the display, much like a cell-phone, is made of glass)
- Protect the unit's display and membrane when packing up your gear. If a tripod fights the display or membrane on the controller – the controller will lose.
- Do not allow dirt to get into the weatherproof seal. This could cause seal failure and damage to the Receiver.
- **Remove all batteries prior to long term storage**.

Failure to properly care for the Scout Receiver could result in a leak that may damage the Receiver. The product warranty does not cover water damage resulting from user error.

2.6.3   Maintaining Weatherproof Design

Scout equipment is designed to meet the most challenging environmental conditions. It does, however, require some care to maintain its weatherproof sealing.

Prior to opening the equipment rinse it under gently running water if it is dirty.

It's very important to keep the housing's silicone seal clean. A single hair or grain of sand could potentially cause the housing to leak and damage the equipment. To clean the seal remove the back cover from the housing, and rinse the back cover in fresh water and shake dry (drying with a cloth may cause lint to compromise the seal). Allow the seal to dry prior to reassembly.

Below is an image indicating the seal location. It is recessed in a groove in the back cover of the equipment.

2.7 The Scout Receiver

SCOUT
Connection Diagram

External Power
Cable - 2m
(Optional)

4m Scout Cable
Included

Use camera to control
Flash(es)

Flash Sync In

12VDC In

Connect to Scout
Weatherproof Flash

Coiled 3.5mm Shutter Cable
(Included)

Figure 1 – Scout Receiver Connections

There are three connectors on the Scout Receiver (left to right):

1. Camera Connector (5-pin)
   Camera half/full press: 3.5mm connector on end of cable
   Flash sync **from** the camera: female RCA

2. Flash/Aux connector (4-pin)
   Wake/ready control for the Scout Flash (coming soon!)
   Flash sync **to** the flash
   Auxiliary control of other devices

3. External power connector (3-pin)
   10-20V external power with optional power cable

The Scout Receiver uses weather-resistant connectors and cables. If the Receiver will be used outside during the rain, snow, or condensing humidity be sure to have the connectors locked in place (including the included connector caps). The 3.5mm and RCA connectors must be kept dry.

2.8 Scout Transmitter

There are three buttons available on the Scout Transmitter.

This is the power button. Press this button to turn on the Scout Transmitter. The red LED will light up and then slowly fade out.

To turn off the Scout Transmitter simply press and hold this button for approximately two seconds until the red LED goes out.

This is the "speed" button. Press this button to adjust the speed of the transmitter. The red LED will flash with the selected speed.

There are three available speeds:
Slow: One LED flash. 100ms transmit rate.
Medium: Two LED flashes. 50ms transmit rate.
Fast: Three LED flashes. 25ms transmit rate.

Increasing the speed will decrease the battery life but even at the fastest transmit speed the battery life will last longer than the receiver.

The default speed is slow which is reasonable for most mammals. If you are trying to capture flying subjects then you should set the speed to the fast setting.

Directional triggering works best when the transmitter speed is set to fast.

This will adjust the transmitter power level. The red LED will flash with the selected power level.

There are two power levels available:
Low: One LED flash. Good for close (less than 33 ft / 10 meters) distances between the transmitter and receiver.
High: Two LED flashes. For distances greater than 33 ft / 10 meters, up to 130 ft / 40 meters.

Using the high power level can cause problems at close range – the transmitter beam can easily reflect off of surrounding objects making it difficult to break the beam. So be sure to use the appropriate power level. Also, increasing the power level will decrease battery life.

The default transmit power is low.

2.9 Camera connection

The Scout Receiver cable uses a 3.5mm connector for attaching it to your camera. If the camera is controlling your flash(es) this is the only connection you need! If, however, you are using one or more Scout Flash(es) you will also need to connect the Scout Receiver's "flash sync" RCA connector to your camera. If your camera has a PC sync connector on it, then all you need is a PC sync to RCA cable:

https://www.cognisys-inc.com/store/pc-rcaf-01.html

If, however, your camera does not have a PC sync connector, you will need a hot-shoe instead:

https://www.cognisys-inc.com/store/hotshoe.html

The final cable required for flash control is an appropriate length standard RCA cable:

https://www.cognisys-inc.com/store/rca-cable.html

Note: The camera connections (3.5mm and RCA) are not weatherproof. Protect these connections from water as needed.

3. Basic Navigation

In this section we'll go into the basics of adjusting settings for the Scout Receiver. If you find your eyes glossing over with all the technical discussion you can always skip to the "5 - Examples" section to start using your Scout Receiver.

3.1 Buttons

There are four buttons on the Scout Receiver:

This is the power button. Press this button to turn on the Scout Receiver. You will see the Scout logo at power-on. At the bottom of the screen is the current version of the software.

To turn off the Scout Receiver simply press and hold this button for approximately two seconds.

Note: You can also give the power button a quick press to take you back to the main screen. This is helpful if you're three levels deep in the menus and just want to get going!

This is the enter button. On the main screen this will bring up the various settings. Use this button to select or modify any setting.

and

Use these buttons to navigate the menus.

3.2 Main Screen Icons

The Scout Receiver will display different icons depending on what features you have turned on.

Wireless is turned on. If using hard-wired flashes you should turn wireless off. See section "4.2.5.1 - Wireless Settings" for details.

LED Alignment is turned on. The red LED on the front of the receiver will flash when it receives infrared from a transmitter. See section "4.2.1 - LED Alignment".

Directional triggering is turned on. The current direction is for the subject moving from left to right. See section "4.2.4 - Trigger Settings".

Directional triggering is turned on. The current direction is for the subject moving from right to left. See section "4.2.4 - Trigger Settings".

The "shot limiter" is active and is preventing the receiver from firing the camera. See section "4.2.5.7 - Shot Limit" for details. You can tap the power button to reset the shot limit.

The receiver will not fire the camera because the current time is outside either of the two time windows. See section "4.2.5.3 - Time Settings".

The Scout Camera Controller feature is enabled which changes the functionality of the Receiver. If you are not using the Scout Camera Controller you should disable this feature. See section "4.2.5.8 – Use Camera Control" for more details.

3.3 Menu Icons

Inside the menus you will see the following icons:

This checkmark means the feature is enabled (turned on).

This will take you back to the previous menu. If you would like to go back to the main screen you can also just tap the "power" button.

3.4 The Screen

The Scout Receiver features an OLED display. Wonderfully readable – but the display is a little power hungry. By default, the Receiver will turn off the display after 30 seconds of inactivity (You can adjust this though – See section "4.2.5.4 - Screen Saver"). If the display is off all you need to do to turn it on is tap any button.

How do you know if the Receiver didn't just turn off? When you first turn it on you will see a short "splash screen" that shows "Scout Receiver" and also the current software version. If the receiver was already on, however, you'll go right to the last screen you were on.

You probably want the display to turn off anyways – no point in drawing attention to the Receiver (from either two or four-leggeds!).

4. Settings

4.1 Settings Navigation Map

Below is the navigation map for all the settings. The links are "clickable" to get you to the specific details about the setting.

LED Alignment

Wake Camera Control

Camera Settings ⟶

    # pics
    Pre-trig time
    On time
    Off time
    Final Off
    Extend On Time
    Extend Off Time
    Periodic Half-Press ⟶

        Enable
        Half-Press Time
        Interval

    HP (Half-Press) Limit

Trigger Settings ⟶

    Sensitivity ⟶

        Low
        Medium
        High

    Directional ⟶

        Off
        Left->Right
        Right->Left
        Selective

System Settings ⟶

    Wireless Settings ⟶

        Enabled
        Channel
        ID
        Scan Channels
        Wake Up

Flash Settings ⟶
        Ready Wait

Time Settings ⟶
        Set current time
        Window On
        Set Start Time
        Set End Time
        Window On
        Set Start Time
        Set End Time

Screen Saver ⟶
        Off
        30 Sec
        2 minute

Lockout ⟶
        On/Off
        Change PIN
        Current PIN

Brightness ⟶
        High
        Low

Shot Limit ⟶
        Enabled (Yes/No)
        Shot Limit
        Limit Window
        Limit Timeout

Use Camera Control

LED on trigger

Load Defaults

Statistics

Clear # Pics

4.2 Setting Descriptions

4.2.1 LED Alignment

This feature when enabled will flash the red LED on the front of the Scout Receiver to indicate that it is properly aligned. If you see the LED go out please adjust the alignment, move the transmitter closer, or increase the transmit power (not available on the base transmitter).

When LED Alignment is turned on it will still activate your camera. The LED will turn green when the camera is active.

The LED alignment feature will automatically turn off after five minutes. You can also de-select it to immediately turn it off.

If the Scout Transmitter is set to its fastest transmit rate the red LED will appear nearly solid on.

4.2.2 Wake Camera Control

If you are using the Scout "Camera Control" system you can remotely turn on it's Wifi without opening the weatherproof box. This can be handy if the box is mounted in an awkward location. After pressing this button the "ScoutCam" access point will be visible on your mobile device.

4.2.3 Camera Settings

The Scout Receiver gives you plenty of flexibility for controlling your camera. You can choose how many pictures you want, how long the half-press is held (focus or wakeup), how long the shutter button is pressed, and even the time between each shutter button press.

Below is a diagram showing the different steps the Receiver will go through when it activates the camera. In this example, "# pics" is set to two, and "final off" is also turned on.

```
Detected _____|‾|_____

Shutter Output _____|‾‾‾‾|_____|‾‾‾‾|_____

              ←Pre-Trigger→←On Time→←Off Time→←On Time→←Off Time→
                              1        1        2        2
```
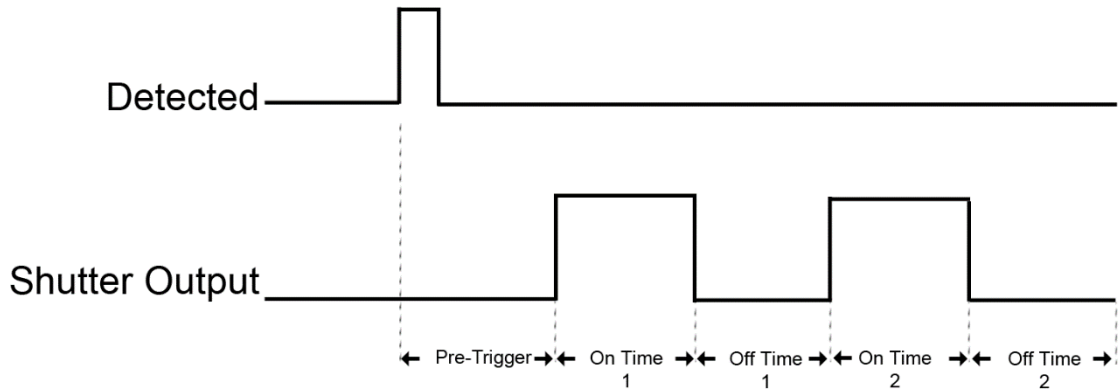
4.2.3.1 # pics

This is the number of times you would like to take a picture when Scout Receiver detects something. This assumes your camera isn't in burst mode, of course! We'll also refer to it as "shutter activation".

4.2.3.2 Pre-trig time

This is the first step after Scout Receiver detects something. During the pre-trigger time the camera's half-press is held down. Some cameras are quite slow to wake up before they'll respond to a shutter activation. You can use this "pre-trig" time to make sure your camera is ready to go! Also since the half-press is held down you could potentially use this to try and get a focus lock on a subject if your lens is set to auto-focus. If "Pre-trig" is set to zero then this step in the shutter activation process is skipped.

4.2.3.3 On time

Once the "pre-trig" time expires (or completely skipped if it is set to zero), the camera's full-press (shutter activation) will be held down for this time.

If your "pre-trig" time is set to zero you will want this "on time" to be at least long enough to wake your camera out of sleep mode.

If your camera is set to burst mode, this is how long the burst mode will be active (minus the wake-up and lag time of the camera of course).

You have the option of selecting seconds or minutes. The minutes can be useful for doing longer video recordings.

4.2.3.4 Off time

The "off time" is how long the shutter button is released. If your "# pics" is greater than one, this will be the duration between pictures.

Once this time expires, the Scout Receiver will start looking for another subject.

4.2.3.5 Final Off

You have the option of disabling the final "off time". Here are two use-cases.

1) The "# pics" is set to one. If "final off" is set to on, then you can use the "off time" to set how long the Receiver will ignore any additional subjects walking through the beam.
2) The "# pics" is set to two. The first shutter activation could start a video recording. You would then set "off time" (the time between shutter activations) to how long you want to record the video (let's say 30 seconds). Then the second shutter activation would happen (because "# pics" is set to two). But for this application, you do NOT want the final off time, because it would mean you'd be waiting another 30 seconds before the Receiver would detect anything.

4.2.3.6 Extend On Time

For some applications (especially video) you may want to extend the duration of the shutter activation if beam activity continues. If "Extend On Time" is enabled and the shutter outputs is currently active, each time the beam is broken again the "On Time" will be extended by its programmed value. See the example below:

The "On Time" (See section "4.2.3.3 - On time") is set to 10 seconds to record a deer as it is passing through the beam. As it would turn out, several deer are going through the beam path and ideally you would want the video recording to continue. As soon as the first deer crosses the beam, the Receiver will activate video recording and keep the shutter press held down for the 10 seconds. As long as additional deer cross the beam within that 10 seconds, the shutter time will reset to 10 seconds each time a new deer crosses the beam.

4.2.3.7 Extend Off Time

Identical to "Extend On Time" except that the off time will be extended. If using this feature be sure to enable "Final Off" otherwise there may not be an "Off Time" to extend if the "# pics" is set to 1.

4.2.3.8 Periodic Half-Press

The Receiver has the capability to periodically give your camera a half-press. Why in the world would you want to do this given that it will decrease the battery life of the camera?

Some cameras (Canon) will exit live-view video recording if allowed to sit idle (in sleep mode) for about 30 minutes. The next time you wake them up – you'll find the camera requires a physical button press to get it back into video mode. Less than ideal when your camera is sitting in a water-tight box for months at a time.

Periodic half-press can work around this problem by every so often giving the camera a good *poke* to make sure it doesn't do something as silly as leaving video mode!

The green LED will light on the Scout Receiver when the camera receives a half-press.

4.2.3.8.1 Enable

Selecting this will enable or disable the Periodic Half-Press feature.

4.2.3.8.2 Half-Press Time

This is how long the half-press will be held down on the camera at the specified interval. Most cameras will wake up with a 0.5 second interval (the default).

4.2.3.8.3 Interval

The "Interval" is how often the camera will receive the half-press signal. You can specify minutes or seconds.

4.2.3.9 HP (Half-Press) Limit

The Scout Receiver allows you to set a duration limit on the half-press. Most photographers won't need this but it can be useful to only allow the half-press (regardless of your shutter settings) to happen once and only once. For Canon customers this could let you use the half-press to wake remote flashes and then use the full-press to fire the camera. In this case, you only want the half-press to occur once but still take multiple pictures.

4.2.4 Trigger Settings

The "Trigger Settings" adjust how the Scout Receiver responds to the detection of a subject in its beam path. This gives you the opportunity to tailor the equipment to your specific needs. Below are the available options.

4.2.4.1 Sensitivity

"Sensitivity" adjusts how sensitive the Scout Receiver is when its infrared beam is crossed. You have three options available – low, medium, and high.

The default setting is "high" which will work in most situations. The "high" setting has been tested in high precipitation (snow and rain) situations without any false triggers. If, however, you will have leaves falling you may want to decrease the sensitivity.

Decreasing the sensitivity will increase the response time of the Receiver. So if you're after fast moving subjects be sure to leave this at "high".

Changing the sensitivity does not affect directional triggering. It only applies to non-directional triggering.

4.2.4.2 Directional

Everyone loves pictures of wildlife. One professional photographer told us though that 80+% of the photographs you get from trail photography will be butt-shots. Statistically, of course, that *should* be 50% -- but in reality that is not the case (a quasi-Murphy's law?). Directional triggering enables you to only get shots of which ever end of the subject you prefer (who are we to judge!).

You have three options to choose from:

1) Off – Don't use directional triggering. Any time the beam is broken you will get a photograph. Use this setting if quantity is more important than pure face pictures. Only the left infrared detector will be used in this setting.

2) Left->Right – Only capture subjects moving left to right. This direction is from the perspective of you looking at the front of the Receiver.

3) Right->Left – like above, only the opposite direction.

When directional triggering (#2 or #3 above) is enabled, you will see an arrow on the main screen indicating first that directional triggering is turned on, and additionally showing which direction it will use.

Note:
If using the Scout Transmitter (not the Scout Base Transmitter), increasing the transmit speed will significantly improve the performance of directional triggering (at the expense of battery life).

4.2.4.2.1   Selective

This option only applies if you have directional triggering (left->right or right->left) enabled.

"Selective" turned off:
Sometimes a subject moves so fast as it crosses the path of the Receiver that the direction can't be determined. All the Receiver sees is that infrared disappeared. If "Selective" is turned off then the Receiver will still activate the camera under this condition. It will not, however, fire the camera when the direction CAN be determined and it is the wrong way.

"Selective" turned on:
The Receiver will only activate the camera when the direction is guaranteed. It means you may miss some shots of fast moving subjects but the direction will be consistent.

4.2.5   System Settings

The "System Settings" category contains less frequently adjusted settings.

4.2.5.1 Wireless Settings

Wireless is used by the Receiver to communicate with other Scout equipment. It uses a 2.4 GHz proprietary RF protocol.

4.2.5.1.1   Enabled

Normally you would leave wireless enabled. It only minimally decreases battery performance if left on. It can, however, slightly increase the delay from when the beam is crossed to when your camera activates.

4.2.5.1.2   Channel

This determines what frequency the Receiver operates on. All Scout equipment for a given setup must be on the same channel to operate properly.

If using more than one Scout setup in the same area (within 60 meters / 200 feet) you should assign each setup its own unique channel.

The default "channel" is 15.

4.2.5.1.3   ID

If using the Scout Receiver with the Scout Camera Controller you can use multiple Scout Receivers to activate different outputs ("ID 1" activates the camera, "ID 2" activates "Aux 1"). This allows extreme flexibility for complicated setups. If not using the Scout Camera Controller the ID has no effect.

4.2.5.1.4   Scan Channels

If selected the receiver will scan the current radio frequency environment and display a bar graph showing the "cleanest" channels to operate on. For maximum range you should select the channel with the highest bar on the graph. You can use the ⬆ and ⬇ buttons to navigate through the channels. If you press the ⏎ button while on a channel your settings will be updated to use that channel. To make no changes use the ⬆ or ⬇ buttons to navigate to the ↢ symbol and then press the ⏎ button.

4.2.5.1.5   Wake Up

When a subject is detected, the Receiver will send a wakeup signal to the other Scout equipment (Camera Box, Flash(es)) to get them ready to take a photo (provided Wireless is enabled).

The "Wake Up" setting determines the speed of wireless wakeup. "Normal" works for most applications but if you need a faster response time you can change this setting to "Fast".

Note: All Scout equipment for a given setup must have its wakeup speed set to the same value. Equipment may not wake properly if not set to the same "Wake up" setting.

Battery consumption will increase on all devices when wake-up speed is set to "Fast".

4.2.5.2 Flash Settings

The "Flash Settings" only apply when using Scout Flash(es).

4.2.5.2.1   Ready Wait

The Scout Receiver has the capability to wait for the flashes to be ready (charged) prior to telling the camera to fire (flashes on first exposure). This helps prevent the subject from being "spooked" with the camera shutter firing but not having the flashes fire.

If "Ready Wait" is turned on, the camera will be activated as soon as the flash(es) are ready.

If "Ready Wait" is off, the camera will be activated immediately upon the subject being detected.

4.2.5.3 Time Settings

The Receiver can limit when it will activate the camera (or wake up other Scout equipment) based on the time of day. If you are only interested in night photographs or you want to decrease "interest" in your equipment from two-leggeds during the day you can use the "time settings" to create a "window" of time. You simply set the current time, a start time, and an end time, and turn on the window.

Two windows are supported. This lets you set up more complex scenarios for triggering (two hours in the morning, two hours in the evening).

If the current time is outside of both of the "windows" then you will see $^{z}z_z$ on the main screen indicating that the Receiver is sleeping and will not activate the camera (even if the beam is crossed).

4.2.5.3.1   Set current time

This will set the current time for the Receiver. The receiver will remember this time even if the batteries are removed (for over 12 hours).

4.2.5.3.2   Window On

A ✓ next to this indicates that the window is enabled. It will use it's corresponding "Start Time" and "End Time" for when it should activate the camera.

4.2.5.3.3   Set Start Time

The "Start Time" sets when the window begins.

4.2.5.3.4 Set End Time

This will set the end time for the window. Here are a couple of examples:

Start Time: 6:00AM

End Time: 8:00AM

In this case, the Receiver will only activate the camera for a two hour period in the morning.

The next example is a little different:

Start Time: 6:00PM

End Time: 8:00AM

Since the start time is after the end time (because it is set to **PM**), the Receiver will activate the camera for 14 hours – starting at 6:00PM and ending at 8:00AM the following day. So please be sure to pay attention to the AM/PM – it could easily get you into trouble!

4.2.5.4 Screen Saver

There's no hiding it – OLED displays are a little hungry for battery life. They also may draw some unwanted attention to the Receiver. In this setting you can adjust how long the screen will remain on after a button press:

1) Off. Do not turn off the screen.
2) 30 seconds (default)
3) 2 minutes

The "Lockout" feature (see below) will not function if the "Screen Saver" feature is turned off.

4.2.5.5 Lockout

"Lockout" is for those paranoid (and rightly so!) people out there who don't want humans stopping by and changing your settings. You've invested in clever ways of securing your camera trapping equipment. That might prevent theft – but it doesn't prevent people from simply turning off your equipment! "Lockout" lets you choose a 4-digit security PIN number that must be entered **any time the screen is turned on**. If you have the "Screen Saver" setting set to "Off", obviously the "Lockout" feature won't work. Enabling the "Lockout" is straight-forward:

1) Select "Change PIN" and choose your PIN number. Do NOT use 0000 as that is the default PIN when the user is prompted.
2) Select "Enable".

Much like your bank card it is best to remember the PIN. The Receiver will remember the PIN and even if you turn off the power OR even remove the batteries – you will not be able to use the Receiver until the correct PIN is entered.

4.2.5.6 Brightness

The Receiver has two brightness levels – "Low" and "High". "Low" is the default.


4.2.5.7 Shot Limit

Sometimes you can get yourself into a bad environment where things are moving around too fast and critters (the ones you don't care about) are causing false triggers. Wasted frames and overheating flashes – **not** good! There is a way to tell the Receiver to stop triggering the camera if it sees too many subjects. Three settings come into play to adjust this. The first is "Shot Limit". This sets the maximum number of pictures that can be taken within the time set in "Window". See the two other settings below.

4.2.5.7.1   Limit Window

This sets the time "window" for the "shot limit". If you get "shot limit" number of frames within "limit window" amount of time, the Receiver will ignore any more detections for a period of time.   If you get a few pictures but it doesn't reach the "Shot Limit" within this amount of time, the number of pictures taken will be reset. See below.

4.2.5.7.2   Limit Timeout

This is how long the Receiver will ignore anything crossing in front of the sensor. You won't have any camera activations for this duration. Also, to indicate that the limit has been reached the display will show the $\frac{s}{L}$ icon (indicating the shot limit has been reached). That's a lot of words. Let's put some numbers to these settings and then walk through a scenario. We'll use the defaults in this case:

"Shot Limit" is set to 10, "Limit Window" is at 20, and "Limit Timeout" is at 300. Your setup is working great – you're getting some great shots. You leave the setup to go into town for an hour. Unfortunately a biblical swarm of cicadas appears (the horror!). Your Receiver, being very effective at detecting things starts rapidly triggering. With the settings above, you'll definitely see 10 cicadas within the 20 seconds – it's a swarm after all! Once the sensor "sees" those 10 within the 20 seconds, the Receiver will ignore any more for 300 seconds (5 minutes). Let's say you get back from town, shoo away the swarm (the cicada story falls apart here), but now you want to start looking for critters again. You see that the $\frac{s}{L}$ icon on Receiver is active. Simply press the power button to reset the shot limiter and it is back to normal. You could have also waited for the 300 seconds to elapse.

4.2.5.8 Use Camera Control

If this option is selected the Scout Receiver will change how it communicates with other Scout devices.

Disabled:
The Scout Receiver operates normally and will activate the attached camera. The Receiver is responsible for firing any Scout Flashes.

Enabled:
The Scout Receiver will wake up the Scout Camera Control system and then notify it that the Receiver has detected something. The Scout Camera Control will fire any Scout Flashes.

4.2.5.9 LED on trigger

Normally when a subject is detected the LED on the front of the Receiver will light to give visual feedback that it detected a subject. There are some cases (like when doing a long exposure) that you may not want the LED to light up. Simply uncheck the "LED on trigger" and it will no longer activate when firing the camera.

4.2.5.10   Load Defaults

This will load the factory default settings for everything.

4.2.5.11   Statistics

The Scout Receiver keeps track of a handful of items. These can help us track down problems you might be having. They include:

> Maximum battery voltage
> Pictures taken
> External sync signals
> Min/Max temperature
> Wireless statistics
> Usage statistics

These statistics are in no way wirelessly transmitted to Cognisys, Inc.

4.2.6   Clear # Pics

This simply clears the "# pics" counter on the main screen.

5. Examples

In the following sections we will walk you through some real-world setups/examples using your Scout Receiver. Be sure to check out our website and follow us on YouTube (http://www.youtube.com/user/CognisysInc/) for video examples. Sometimes watching a video makes the whole process much easier to understand!

5.1 Camera Settings

Here are some suggested camera settings.

Drive Mode: Single or Continuous. If set for "Single", then you can have the Scout Receiver control how many shots are taken (# pics) and how much time there should be between the shots (Off time). If set to "Continuous", then the "# pics" should be set to "1", and the "On time" on the Receiver should be set to how long you want to run the camera in "Continuous" mode. You'll want to make sure your flashes can keep up at the camera's frame rate with whatever power setting their set at. Make sure that mirror lock-up is turned off!

Camera Mode: The two most common modes are Aperture Priority (Av) or Manual (M) mode. If set to Aperture Priority and evaluative metering then you'll have a properly exposed background during the day, but as night comes the camera's shutter speed is going to become very long. In complete darkness, this means it could increase to in excess of 10 seconds – meaning you'll probably only get one shot of the subject moving through. It is important to keep in mind that the shutter speed will vary greatly from sun up to sun down.

In Manual (M) mode, you'll have to stop down enough to not become over-exposed during the day, but also allow enough light from the flashes to expose the subject. This may mean an under-exposed background even during the day.

Either of these modes have compromises for day/night operation. Just remember that the Scout Receiver has two separate "Time Settings" that can let you exclude trouble periods for ambient light.

f-stop: Since you don't know where in the beam-path the subject will be – set your f-stop as large as you can possibly stomach. f/8 is a good starting point. The larger the f-stop though, the brighter the flashes will have to be. Brighter flashes = shorter battery life.

ISO: You likely don't have a $5,000 camera in your camera box do you? That means the high-end of your ISO is going to be more limited. Setting it low, however, will mean the flashes will have to work that much harder.

Auto-focus: While you CAN use auto-focus, you're counting on the subject to not be moving terribly fast and your auto-focus locking onto your subject before it moves. Your camera has to wake up and achieve a focus lock (hopefully on your subject!). Definitely don't use auto-focus if doing night-time photography. Because of those variables we'd recommend sticking with manual focus. If you're only interested in day-time photography you can always have the Scout Receiver operate just during the day. See section "4.2.5.3 – Time Settings" for details.

Power Management: Turn off the image review feature. Also set the "auto power off" to the minimum.

Noise Management: For all that is holy in the world be sure that your focus-lock "beep" is turned off.

Lens: Wide-angle, auto-focus turned off (probably), image-stabilization turned off.

> **Note**: We experienced issues with the Canon EF-S 10-18mm lens. The first shot would always be blurry even if auto-focus was turned off. If you hold the half-press down for a short duration (by setting the "Pre-trig time") you could then get a good focus. Sacrificing time to get a lens to work? It wouldn't be on our recommended list.

5.2 Wired Camera (camera controls flashes)

For this setup the receiver will only control the camera using the 3.5mm shutter cable. The camera is responsible for waking and firing the flashes. Here are the settings to optimize the performance:

1. Turn off Wireless. Go to System Settings->Wireless (See "4.2.5.1 - Wireless Settings").
2. Turn off Ready Wait. Go to System Settings->Flash Settings->Ready Wait (See "4.2.5.2.1 - Ready Wait").

The Scout Receiver will then follow this process:

1. The infrared beam detects a subject.
2. The Receiver tells the camera to take a photograph.
3. The camera will fire the flash(es) at the appropriate time by either wired or wireless methods.

Figure 2 - Basic Connection Diagram

5.3 Wired Camera (Scout Receiver controls Scout Flashes)

The advantage of this setup is a significant reduction of wires – all the flashes are wireless! The 3.5mm shutter cable still goes to the camera but you also need to connect the female RCA cable to the camera's PC sync port (or via a hot shoe). Adding the flash sync connection will let the Receiver know when it should fire the wireless flashes. We discuss this in "2.9 - Camera connection". Here are the optimal settings:

1. Turn ON Wireless. Go to System Settings->Wireless (See "4.2.5.1 - Wireless Settings").
2. Turn ON Ready Wait. Go to System Settings->Flash Settings->Ready Wait (See "4.2.5.2.1 - Ready Wait").

The Scout Receiver will then follow this process:

1. The infrared beam detects a subject.
2. The Receiver will wake the flashes and wait for them to become quick-charged.
3. The Receiver tells the camera to take a photograph.
4. When the camera's shutter is open, the camera activates the "flash sync" signal.
5. The Receiver then wirelessly transmits to the flash(es) to activate.

If using more than one Scout Flash you must make sure that each flash is assigned a unique wireless ID. For more details please refer to your Scout Flash Owner's Manual.

5.4 Full Wireless

The full wireless version requires the Scout Camera Controller and the Scout Weatherproof Flashes or LED's. In this setup there are no cables between any of the equipment giving you complete photographic (and equipment) freedom.

To enable this setup on the Scout Receiver:
1. Turn ON Wireless. Go to System Settings->Wireless (See "4.2.5.1 - Wireless Settings").
2. Enable CameraCtrl support System Settings->Use Camera Ctrl (make it checked – see "4.2.5.8 - Use Camera Control").

On the Camera Controller:
1. Make sure that the "Camera (Internal)" is set to use "Any" or "Receiver", and that the "ID" is set to "Any" or "1" (or whatever ID you have customized in System Settings->Wireless on the receiver). This is the default.
2. That's it!

The Scout Receiver follows this process:

1. The infrared beam detects a subject.
2. The Receiver wakes the Camera Controller and tells it that a subject has been detected.
3. The Camera Controller will wake the Scout Flashes and wait for them to become quick-charged (The LED's wake immediately).
4. The Camera Controller then tells the camera to take a photograph (or start video).
5. When the camera's shutter is open, the camera activates the "flash sync" signal.
6. The Camera Controller then wirelessly transmits to the flashes to activate.

5.5 Video Recording (Receiver controls camera)

For this setup the receiver will only control the camera using the 3.5mm shutter cable. This assumes the camera supports video recording using a shutter release cable. Here are the settings to optimize the performance:

1. Turn off System Settings->Wireless (See "4.2.4.1 - Wireless Settings").
2. Turn off System Settings->Flash Settings->Ready Wait (See "4.2.4.2.2 - Ready Wait").
3. Set the number of pictures to be taken to two:
   Camera Settings->#pics (See " 4.2.3.1 - # pics").
4. Set the "Pre-trigger" duration to something long enough to guarantee that the camera will be awake and respond to the shutter activation to start video recording:
   Camera Settings->Pretrig time (See "4.2.3.2 - Pre-trig time"). This time will vary depending on the camera but 0.5 seconds is a good place to start.
5. Set the duration of the video recording by adjusting the time between the shutter activations:
   Camera Settings->Off time (See "4.2.3.4 - Off time").
6. Turn off Camera Settings->Final off (See "4.2.3.5 - Final Off").

This setup assumes it takes one shutter press to start video recording and another to stop it. It is absolutely critical that you verify the pre-trigger time (the duration the half-press is held down) is sufficient to wake the camera and have it respond to the start recording signal (the first shutter press). If it is not long enough you could run into a situation where it misses the first start recording shutter activation but catches the second one. This means the camera would be recording for the entire duration that you DON'T want it to! (All the time between detected events) You might come back to a full memory card if this happens…

The Scout Receiver follows this process:

1. The infrared beam detects a subject.
2. The Receiver holds down the half-press on the camera for the duration of "pre-trigger".
3. Then the Receiver activates the shutter button to start video recording.
4. It waits for the "off time" (your record duration).
5. Finally it activates the shutter button again to stop video recording.

The wiring diagram is the same as the Wired Camera option.

5.6 Maximum Battery Life

Battery life is a tricky business. There is some magic chemistry going on inside of those little things that can significantly affect the performance of your Scout equipment. Of course, you'll probably want to use rechargeable batteries because the landfills likely don't need any more tossed in them. Here are some things to consider:

1. Use low self-discharge (LSD) rechargeable batteries such as Eneloop. Otherwise you could be losing 2% of your battery life per day just from the battery itself. At high temperatures (the Receiver in the Sun) it could be as high has 6% per day!
2. Speaking of temperatures – batteries are typically rated at 25C. They lose some of their capacity at warmer temperatures but at cold it's *really* bad. A 2500 mAh battery at -20C (-4 F) could only have 500mAh of capacity. So if your Scout Receiver normally had 100 days of battery life it would be cut down to 20 days – a big difference! If you're planning on long-term deployments at cold temperatures you may want to consider an external battery pack.
3. Use batteries of the same age and type. Mixing in an old battery with new ones could cause the old battery to be over-discharged damaging the battery and significantly decreasing the overall battery life of the system.
4. The Scout Receiver displays the current voltage it is receiving from either the internal or external battery pack. Don't be alarmed if the voltage displayed drops quickly if you take batteries from the charger and put them in the Receiver. It's normal for rechargeable batteries to drop their voltage in a day or two after coming off the charger. The Scout Receiver isn't being more hungry than necessary!
5. Batteries are typically "empty" when each cell is at 0.9V. So if your Receiver says the input voltage is 5.4V (6 cells x 0.9V) there isn't much capacity left.

Now that we've worked through the battery chemistry here are a few things you can do to extend the battery life of the Receiver:

1. Set the Scout Transmitter to its slowest transmit speed (the base transmitter only transmits at the slowest speed). The less time the Receiver is looking for infrared the less power it will use.
2. Turn off the wireless option if not using it (See "4.2.5.1 - Wireless Settings"). This won't make a large difference since it is only used when a subject is detected – but every little bit helps!
3. Leave the Screen Saver at the default 30 seconds (See "4.2.5.4 - Screen Saver").
4. If possible keep the Receiver out of direct sunlight. Electronics tend to draw more current when warm.

Following these steps can help you get in excess of three months of battery life from the Scout Receiver!

5.7 Receiver and Transmitter Placement

The height of the Receiver should be targeting the center body mass of the subject you are interested in. The Receiver may miss the subject if it is moving fast and only legs are crossing the beam. This is especially important if using directional triggering. Adjusting the height also lets you "filter out" subjects that you are not interested in photographing. If the receiver is placed close to a dirt ground it is possible that in the rain dirt may splash up on the receiver blocking its ability to detect the subject.

Here is an example of a setup targeting small subjects (but it may catch some larger ones as well). The Scout Receiver and Transmitter are placed low on the trees:
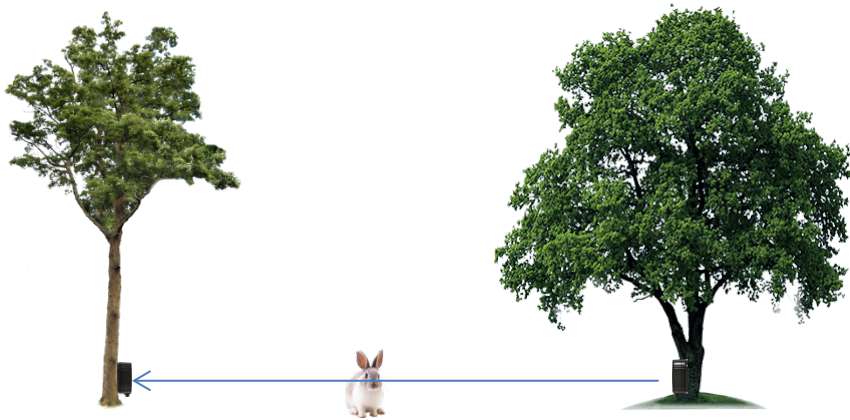
Below is an example of targeting taller subjects. No rabbits in the photographs.

The rabbit walks under the beam and is missed (thankfully!). Setting the height of the Scout equipment is an easy and effective way of selecting the size of the subject desired!

Once the height is set for the Receiver, turn on the LED alignment feature (See "4.2.1 - LED Alignment"). Determine a suitable (and ideally at the same height) position for the transmitter and adjust the position so the red LED on the receiver consistently flashes. If there is more than 30 feet between the receiver and transmitter consider changing the Transmitter power level to maximum (not available on the Scout Base Transmitter).

If at all possible place the receiver so it is not facing directly into the sun. While the Scout is very ambient light immune, facing the sun (especially when the front of scout gets dirty) is the worst case scenario for triggering. Think of driving down the road with a dirty windshield and the sun hits your car. What do you see? Not much!

Use the long range of the Scout system to keep the trail monitoring system out of view of passers-by but be mindful of vegetation that could blow in front of the receiver or transmitter and cause triggering issues. Speaking of vegetation – If you're going to do a long term deployment keep in mind some vegetation grows…. Fast. Your setup might have been perfect when it started but weeds blowing in the wind could wreak havoc.

Once the Scout transmitter and receiver are set up focus your camera on where the beam is but be mindful to keep both out of the frame of your image.

6. Installing the Reflash software (optional)

What is "reflash"? It's a small program that allows you to update the firmware on your Scout Products. **You do not need this program to use your Scout equipment.** Rest assured if you just purchased your Scout it ships with the latest software available. If, however, new firmware becomes available you may want to upgrade your controller. Do you have to upgrade your firmware? No. Should I upgrade your firmware? Maybe. We say "maybe" because as new firmware is released we are adding and improving features. This means changes to the user interface and things might not look exactly how they did before you updated the firmware. So if you discover that a new feature is available that you absolutely have to have, then by all means go ahead and reflash your controller. Just keep in mind that things might look and behave a little different! The other consequence to reflashing your controller is that you *may* lose any stored settings.

Scout products can only be updated over USB. The reflash process takes a few seconds.

Reflash requires a firmware package (instructions included). You can find the package here: http://www.cognisys-inc.com/products/scout/scout_tech_specs.php

 Whether you use Windows or OS X, you will **need** Oracle's Java installed for Reflash to load. You can download it here: http://java.com/download

6.1 Windows Installation

Windows installations should automatically detect and download the USB drivers required. Some operating system settings can prevent automatically downloading the drivers. If that is the case, use the above link in section "6 - Installing the Reflash software

Once the installation is complete you will have a "Start Menu" folder called Cognisys. Underneath that you will find the Reflash icon.

## 6.2 OS X Installation

Reflash requires Java 1.7 or later from Oracle. This version of Java requires that your OS X version be 10.7.3 (Lion) or above. It has not been tested with older versions of Java or earlier versions of OS X and is not supported.

Use the above link in section "6 - Installing the Reflash software".

Once installation completes you will have a "Reflash" icon on your Launch Pad:

7. Troubleshooting

Problem	Cause	Solution
Display does not light when power button is pressed.	Batteries not installed.	Insert batteries.
	Battery polarity is incorrect.	Verify all batteries are installed correctly.
	Batteries are low or a bad battery cell.	Verify the quality of the batteries (multi-meter, test with other equipment)
Display keeps turning off	Screen Saver is on	This is normal in order to conserve energy. You can disable the screen saver. See section 4.2.5.4 for details.
Receiver asks for PIN code every time.	"Lockout" is enabled.	See section 4.2.5.5 for disabling the "Lockout" feature.
Camera or flash does not activate when beam is broken.	Equipment in sleep mode.	Ensure equipment is in ready mode.
	"Camera Settings" are incorrect.	See 4.2.3 for proper settings. They could be too fast for your camera.
	Camera is off.	Turn on the camera.
	Camera has auto-focus turned on.	If the camera cannot achieve focus lock it may not take a photo. Turn off auto-focus on the lens.
	Shutter cable not fully seated.	With new products the connectors can be quite stiff. Be sure the shutter cable is fully seated into the camera.
	$^z{}_z{}_z$ is on display.	"Time window" is preventing the camera from firing. See section 4.2.5.3.
	$^s\!/_L$ is on the display.	"Shot limit" has been reached. See section 4.2.5.7.
Camera takes multiple pictures.	Camera set to burst shooting mode.	Turn your camera to "single shot" mode.
	"Camera Settings" are incorrect.	See section 4.2.3 for adjusting the number of pictures.
Need to restore factory settings	You just want to start over!	With the Receiver powered off, press and hold the power button until the red power light goes out. Release the power button. Optionally you can load the defaults from the settings page. See section 4.2.5.10.

If you cannot resolve a problem with your Scout Receiver, please contact us at support@cognisys-inc.com. We want to make sure that you are completely satisfied!

8. Specifications

Specifications are intended for reference only. The design may be modified to improve features or functionality without notice.

Specifications	MIN	NOM	MAX	UNITS
Input Voltage	5	7.4	20	Vdc
Input Current -- Full on (6AA batteries at 1.2V each)	-	15.4		mAdc
Input Current – Display off	-	0.7	-	mAdc
Shutter Output Current Sink	-	-	1	Adc
Battery life (internal - Eneloop batteries at 25C) [1]	-	100	120	days
Real-time clock life without batteries	-	16	-	hours
Wireless Range[2]		15	30	m
		50	100	feet
Infrared Range (TX Low power/Base transmitter)		15		m
		50		feet
Infrared Range (TX High power)		40		m
		130		feet
Operating Temperature	-40	25	80	C
	-40	77	176	F

- 32-bit high performance low current ARM Processor
- OLED dot matrix display – great readability in direct sunlight!
- Wireless connectivity: Proprietary 2.4GHz
- Directional triggering
- Real-time clock for time-windowed triggering (two windows provided)
- Powered by 6 AA batteries and/or external power
- Camera flash sync input
- Flash sync output
- Flash wake output
- All outputs are open drain (Can be used for flash trigger or shutter trigger)
- USB for reprogramming

[1] See section "5.6 - Maximum Battery Life" for additional information on battery life.
[2] Several factors can affect the wireless range. Congestion, terrain, etc…

9. Warranty

Limited Warranty

The Scout Receiver, Transmitter, Base Transmitter, Flash, LED, and Camera Controller (hereby referred to as "Scout Equipment"), software, and related equipment is provided by Cognisys, Inc. "as is" and "with all faults." Cognisys, Inc. makes no representations or warranties of any kind concerning the safety, suitability, lack of viruses, inaccuracies, typographical errors, or other harmful components of Scout Equipment and its related software. There are inherent dangers in the use of any product, and you are solely responsible for determining whether Scout Equipment is compatible with your equipment and other software installed on your equipment. You are also solely responsible for the protection of your equipment and backup of your data, and Cognisys, Inc. will not be liable for any damages you may suffer in connection with using or modifying Scout Equipment and/or its related software.

All electronic products are warranted to be free from defects in materials or workmanship for two (2) years from the date of purchase. Within this period, Cognisys Inc. will, at its sole option, repair or replace any components which fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alterations or repairs. This warranty is non-transferable.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL COGNISYS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Cognisys, Inc. retains the exclusive right to repair or replace the product or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

10.   Revision History

Revision	Date	Change
1.0	04/28/2017	Initial Release
1.1	02/06/2018	Added Camera Controller references Added Aux support Periodic HP changed from sec/min to min/hours Added selectable sec/min for shutter activations (for video work) Added wireless ID for multiple receivers and one camera controller Added LED on trigger to selectively disable the LED Added HP Limit
1.2	10/29/2019	Added reference to Scout LED. Removed references to Scout Flashes coming soon – they've launched!