# ImmersionRC Uno2400 v1
# 2.4GHz Audio/video receiver

*Instruction manual - International edition*

# Overview

The Uno2400 follows in the footsteps of it's Uno5800 'big brother', an extremely popular Audio/Video receiver designed for the FPV market.

With > -95dBm sensitivity the Uno2400 is sensitive, very sensitive. Paired with an appropriate antenna, it will give you many  miles/km of range. Add an antenna tracker, and a higher gain antenna, and this range increases significantly.

This sensitivity does not come at the expense of increased interference from nearby UHF transmitters. The Uno2400 is heavily filtered against UHF interference, even when the interfering antenna is in very close proximity to the receiver.

It is engineered from an FPV-er's perspective and hence has features to match. It'll warn you when the receiver battery runs low, with an automatic, or user-settable low voltage threshold.

It is designed for single-cable, plug and play, integration with the ImmersionRC Ground Station, or Antenna Tracker v2.
Power, Audio, Video, and a bidirectional data link, are all passed through a single Mini-Din connector, connected to the Ground Station.

Alternatively, traditional 3.5mm jacks, and DC power jacks, are provided for compatibility with older systems.

The data link allows the Ground Station to know, at all times, the received signal strength (RSSI), allowing it to warn the pilot of low-signal conditions. This signal may also be used to help 'hone' a GPS-tracked antenna mount, to ensure that the antenna is always optimally positioned pointing at the plane.

This same data link allows the Ground Station to control various aspects of the receiver, including the channel selection. For receivers mounted directly on the antenna's RF output (where cable losses are eliminated), which are not easy to access, this can be a real help

# Package contents

1 pcs - Uno2400
1 pcs - 2.4GHz antenna
1 pcs - DC power cable to soldered ends
1 pcs - 3.5mm Male to 3x Phono cable

# Operation

Operating the receiver is simple. Two push buttons are used to select the frequency band, and the channel required. They are also used to set up user configurable settings. After applying power, and provided the 'auto' setting for the low voltage warning is selected, it'll beep the number of LiPo cells it has detected. So two beeps is a 2S LiPo and the low voltage warning is set to 6V, three beeps is a 3S LiPo and the low voltage warning is set to 9V.

The Uno 2400 A/V receiver can tune to 13 unique frequencies in the 2.4GHz Amateur radio, and ISM bands. All of the channels from the popular 'Lawmate' 2.4GHz transmitters are supported, along with frequencies used in earlier ImmersionRC 2.4GHz equipment (also known as the 2.4GHz 'Airwave' band).

When the low voltage battery alarm is triggered the receiver will start to beep indicating you need to charge or change the battery. Furthermore it'll also beep when the input voltage is too low, less than 5V or too high, more than 13V. At voltages less than 5V it will not work reliably, at voltages over 12V it will run hot over a longer period of use, so this is not recommended. The power input is reverse polarity protected; however it is good practice to always check polarity prior to applying power. The Uno 2400 A/V receiver power connector is center pin positive.

# Programming

The Uno 2400 A/V receiver can be configured to store user selected configuration settings. The selected band, and channel will always be stored so at power up it defaults to the last selected frequency.
Other settings that can be configured are:

- Low voltage alarm threshold

Programming these settings is accomplished by using the CHAN push button, with feedback from the internal beeper, in a manner similar to that used by most ESCs (Electronic Speed Controllers).

To enter the programming menu, hold down the CHAN push button for 5 seconds or longer. Once the programming menu has been activated, the receiver will start cycling through the menu options, in the order listed.
To change one of the items, wait for it to be 'played', and immediately after, press the button.

The receiver will then 'play' the current value, as a number of beeps, and will then start from the first option, and play each option until the last. Selecting an option is simply done by waiting for it to be played and pressing the button briefly.
See beep codes in the table below.

For example to change the Low Battery 100mV setting:

**Button pressed for > 5 seconds**

| | | |
|---|---|---|
| Dash Dot Dot | - second menu item | **press button briefly to enter setting** |
| Dot | - | **current setting (auto)** |
| Dot | - first available option | 0.0v **press button briefly** |
| Dot Dot | - second available option | 100mV **press button briefly** |

At this point the Low Battery 100mV setting has been changed to '100mV'. The module will now continue with the next item in the menu, and continue to the end of the list. Once the end of the list is reached, the receiver will automatically exit the programming mode signaled by two short beeps.

## Beep Codes

| Beep Code | Menu | Menu Choices |
|---|---|---|
| – . | Low Batt Volts | 1 – Auto (for 2S or 3S LiPo)*<br>2 – 6v<br>3 – 7v<br>4 – 8v<br>5 – 9v<br>6 –10v<br>7 – 11v<br>8 – 12v<br>*Default: 6V for 2S, 9V for 3S* |
| – . . | Low Batt 100mV | 1 – 0.0v …. 10 – 0.9v<br>*Default: 0.5v (for threshold of 9.5v)*<br>*(Ignored in Auto mode)* |

*Note that * indicates the default value .*

## Low Battery Volts and Low Battery 100mV

These two options can be combined to set the threshold at which the low-voltage alarm sounds.

In Auto mode (the default), the receiver will sense the attached battery voltage, and will set the alarm voltage accordingly (6V for 2S and 9V for 3S LiPo). This mode is designed only for use with LiPo batteries. For use with NiCD, NiMh, or other batteries, set the alarm voltage manually, for example:

| | |
|---|---|
| 9.2v | set LowBattVolts to 5 (9v), and LowBatt100mV to 3 (0.2v) |
| 10.0v | set LowBattVolts to 6 (10v), and LowBatt100mV to 1 (0.0v) |

When powering the receiver from LiPo batteries, it is important to note that the discharge curve is fairly flat, and drops off quickly near the end. Setting a threshold of around 3.0/cell is relatively safe. It is however highly recommended

to perform a ‘dry-run’ after setting the voltage warning threshold to make sure the low battery warning is set up correctly.

If upon connection of a battery pack the receiver beeps continuously then the low battery warning is set higher than the voltage from the battery pack, so reset accordingly or charge the battery pack.

Note that regardless of the low battery alarm settings, a fixed alarm will occur when an input voltage smaller than 5V or larger than 13V is detected. This safeguards the receiver from being used with input voltages with which the correct operation cannot be guaranteed.

*Safety Note: Even though this alarm will provide some protection against loss of video signal during an FPV flight, it is highly recommended to fully charge all battery packs used before each and every flight.*

## Optimal Antenna Connection

The Uno2400 was designed to be connected directly to the antenna’s RF connector with as short a cable as possible, or ideally no cable at all.
Years of experience has shown that with this configuration, the best reception will be obtained.

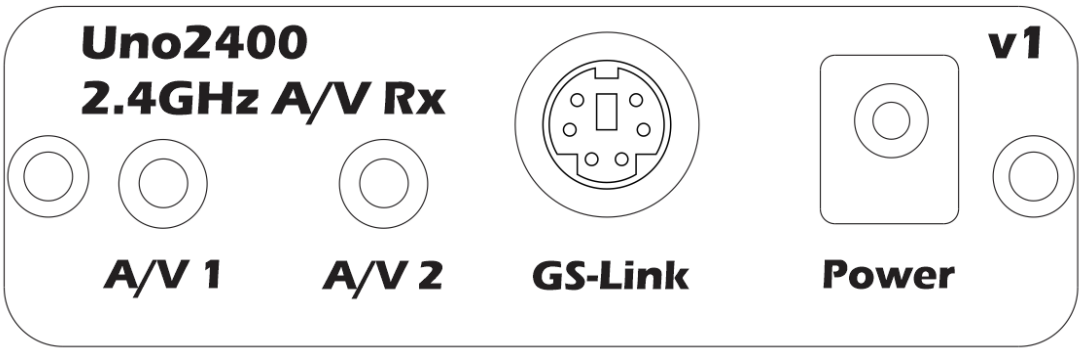
# Special ‘Long Range’ Edition

The Uno2400 is available in a special ‘Long Range’ edition, with approx. 4dB more sensitivity. This sensitivity comes at the expense of immunity to nearby RF sources, such as UHF Long Range uplinks.

For applications where sensitivity is critical, and the UHF control link can be kept clear of the 2.4GHz receiver antenna, these receivers will deliver exceptional performance.

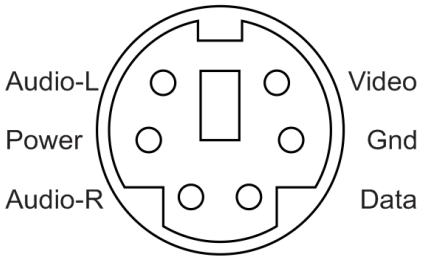
Sensitivity-wise, the standard Uno2400 is already on par with most of it’s competitors, so for most users the standard product is the most suitable choice.

# Connections




## Groundstation Link Connection

The Ground Station link is a standard 6-pin mini-din, as used for many years by PS/2 mice and keyboards.
This connector may be used to power the receiver, and also interface to the Video, and Audio output lines.



# Frequencies

The Uno2400 supports 13 unique frequencies, spread over 4 bands. These bands correspond to various standards commonly used in the 2.4GHz FPV world, and have some history behind them.

| | CH1 | CH2 | CH3 | CH4 | CH5 | CH6 | CH7 | CH8 |
|---|---|---|---|---|---|---|---|---|
| **Band 1** *Lawmate* | 2410 | 2430 | 2450 | 2470 | 2370 | 2390 | 2490 | 2510 |
| **Band 2** *Airwave* | 2414 | 2432 | 2450 | 2468 | - | - | - | - |
| **Band 3** *EU Band* | 2370 | 2396 | 2410 | 2430 | - | - | - | - |
| **Band 4** NexWaveRF USA (US) | 2396 | 2396 | 2410 | 2430 | - | - | - | - |

*Note that the ImmersionRC 700mW 2.4GHz transmitters are available (currently) in two versions, an international version, which uses the common Lawmate frequencies (Band 1), and a USA (Band 4, US) version, which uses three frequencies legal for use in the USA (and legal for US retailers to ship to domestic customers)*

*Band 3 falls within the UK/EU Amateur radio band, and is available by special order (contact your local retailer if you are interested in this product)*

# Support

First line of support is handled by the reseller. If you encounter any problems with your ImmersionRC product contact them first.

For support on issues involving equipment from other brands and also general support for ImmersionRC products, the best place to go is the ImmersionRC section of FPVlab.com.
We actively monitor this forum and provide support here.

## Regulatory notice

The use of this product may be prohibited in your country/region/state, please verify that the RF output power and frequencies used by this transmitter comply with local rules and regulations, this product may require a license to operate.

## Directions on safety

ImmersionRC advocates the safe use of their products, always make sure you equipment is in proper working order, is checked prior to every flight and that your are familiar with and respect the equipment's capabilities and limitations. Do NOT fly recklessly, do NOT fly near airports, freeways, towns, people, etc, basically anywhere where a equipment failure or pilot error can result in injury or damage to people and/or property.

## Warranty

For warranty claims or repair requests please consult the retailer that you purchased this product from, they will be able to help you with your warranty claim or repair request.

## Like Us

We would like thank you for purchasing this ImmersionRC product.

Like ImmersionRC's Facebook page and be kept up-to-date with news, product releases, firmware updates, tips and tricks, and other information relevant to the FPV hobbyist.

http://www.facebook.com/ImmersionRC

You can also follow us on Google Plus
google.com/+immersionrc

We have even been known to Tweet on occasion
https://twitter.com/@immersionrc

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