Racelink Onair protocol

Lora Preamble = 2

Standard Packet Length = 8?

# On Air Protocol

Standard Packet in Fast mode are transmitted with LoRa Modulation, 500kHz BW, SF = 6.

# Important Features and Notes

During a normal packet only the first 4 channels (AETR) are sent to minimize the on-air time.

The 4 gimbal channels are compressed into 5 bytes, IE 10 bits per channel giving 1024 values (should be plenty)

Standard 1-4 Channel RC Data Packet

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Preamble | Payload | | | CRC |
| 2 Bytes | Address (1 Byte) | Header (1 Byte) | RC data (5 Bytes) | 1 Byte |
|  |  |  |  |  |

The other channels (5 - 16) are intended to be used as ‘switches’ so they are NOT encoded as full channels. Instead they are encoded within only 3 bits, using 5 states: LOW, LOW-MID, MID, MID-HIGH, HIGH. This should mesh well with 2/3/5 POS switches on most controllers.

Furthermore, updates for these channels (5-16) are sent only when a change is detected. Additionally, the data packet contains 2 copies of the data and 2 CRCs so that it is not possible for an erroneous packet to disarm or change flight modes on an aircraft.

Channels 5-16 Switch Update Data Packet

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Preamble | Payload | | | CRC |
| 2 Bytes | Address (1 Byte) | Header (1 Byte) | RC data (6 Bytes) | 1 Byte |
|  |  |  | 2 bytes + crc, 2 bytes + crc |  |

Header Byte, TX - > RX

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 00 = Std 4 Channel PKT  01 = Switch Packet RQ SENT | |  |  |  |  |  |  |

Header Byte, RX - > TX

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 00 = Std Pkt  01 = Switch Packet RQ REV | |  |  |  |  |  |  |