# Strelka Specific Packet Types

This document outlines the application specific packet types.

## STREAM\_PACKET\_TYPE\_0

Data streaming packet.

Identifier: 0x0024

Payload:

*<Start of payload>*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Timestamp | GPS1 latitude | GPS1 longitude | GPS1 altitude | GPS1 satellites tracked |
| Value | *Milliseconds since boot* | *Decimal degrees* | *Decimal degrees* | *Units of ‘m’* | - |
| Data type | uint32\_t | float32\_t | float32\_t | float32\_t | uint8\_t |
| Length (bytes) | 4 | 4 | 4 | 4 | 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Acc1X | Acc1Y | Acc1Z | VelX | VelY | VelZ |
| *Units of ‘g’* | *Units of ‘g’* | *Units of ‘g’* | *Units of m/s* | *Units of m/s* | *Units of m/s* |
| float32\_t | float32\_t | float32\_t | float32\_t | float32\_t | float32\_t |
| 4 | 4 | 4 | 4 | 4 | 4 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Baro1 altitude | gyro1X | gyro1Y | gyro1Z | Quaternion 1 | Quaternion 2 |
| *Units of m* | *Units of rad/s* | *Units of rad/s* | *Units of rad/s* | *q1* | *q2* |
| float32\_t | float32\_t | float32\_t | float32\_t | float32\_t | float32\_t |
| 4 | 4 | 4 | 4 | 4 | 4 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Quaternion 3 | Quaternion 4 | Battery voltage | Flight State | Ambient temperature | Available flash memory |
| *q3* | *q4* | *Units of V* | *Enum defined below* | Units of deg C | Units of Kbytes |
| float32\_t | float32\_t | float32\_t | uint8\_t | float32\_t | float32\_t |
| 4 | 4 | 4 | 1 | 4 | 4 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Task error state | Error State |  |  |  |  |
| *Indicates tasks that have entered an error state* | *Details the error type dependent on task* |  |  |  |  |
| uint8\_t | uint8\_t |  |  |  |  |
| 1 | 1 |  |  |  |  |

*<End of payload>*

***Flight State:***

|  |  |
| --- | --- |
| State description | Value |
| Idle on pad | 0 |
| Launched | 1 |
| Burnout | 2 |
| Apogee | 3 |
| Main chute deploy | 4 |
| Landed | 5 |

***Task Error State:***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bit index | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Task error type | CAN | Extended Kalman Filter | GPS tracker | Data logging | Sample Baro | LoRa Radio | Sample Sensors | State machine |

***Error Codes:***

**CAN Task:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Error code |  |  |  |  |  |  |  |  |
| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Description |  |  |  |  |  |  |  |  |

**EKF Task:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Error code |  |  |  |  |  |  |  |  |
| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Description |  |  |  |  |  |  |  |  |

**GPS Tracker Task:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Error code |  |  |  |  |  |  |  |  |
| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Description |  |  |  |  |  |  |  |  |

**Data Logging Task:**

|  |  |
| --- | --- |
| Error code | FatFS FRESULT |
| Value | - |
| Description | FRESULT enum value defined in ff.h |

**Sample Baro Task:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Error code |  |  |  |  |  |  |  |  |
| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Description |  |  |  |  |  |  |  |  |

**LoRa Radio Task:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Error code |  |  |  |  |  |  |  |  |
| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Description |  |  |  |  |  |  |  |  |

**Sample Sensors Task:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Error code |  |  |  |  |  |  |  |  |
| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Description | MS5611 failure | BMX055 failure | ASM300 failure |  |  |  |  |  |

**State Machine Task:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Error code |  |  |  |  |  |  |  |  |
| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Description |  |  |  |  |  |  |  |  |

SYSTEM\_STATE\_PACKET\_TYPE\_0\_RES

Requests system state packet.

Identifier: 0x0035

*Payload:*

*<Start of payload>*

|  |  |  |
| --- | --- | --- |
| Name | Timestamp | Battery voltage |
| Value | *Milliseconds since boot* |  |
| Data type | uint32\_t | float32\_t |
| Length (bytes) | 4 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| Drogue e-match state | Main e-match state | Arm drogue state | Arm main state |
| *Flight State* | *Flight State* | *1 – armed, 0 - disarmed* | *1 – armed, 0 - disarmed* |
| uint8\_t | uint8\_t | uint8\_t | uint8\_t |
| 1 | 1 | 1 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| GPS1 good | GPS1 latitude | GPS1 longitude | GPS1 altitude | GPS1 satellites tracked |
| 0 – error, 1 - good | *Decimal degrees* | *Decimal degrees* | *Units of ‘m’* | - |
| uint8\_t | float32\_t | float32\_t | float32\_t | uint8\_t |
| 1 | 4 | 4 | 4 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| acc1 good | acc1X | acc1Y | acc1Z |
| 0 – error, 1 - good | *Units of ‘g’* | *Units of ‘g’* | U*nits of ‘g’* |
| uint8\_t | float32\_t | float32\_t | float32\_t |
| 1 | 4 | 4 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| acc2 good | acc2X | acc2Y | acc2Z |
| 0 – error, 1 - good | *Units of ‘g’* | *Units of ‘g’* | U*nits of ‘g’* |
| uint8\_t | float32\_t | float32\_t | float32\_t |
| 1 | 4 | 4 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| gyro1 good | gyro1X | gyro1Y | gyro1Z |
| 0 – error, 1 - good | *Units of ‘deg/s’* | *Units of ‘deg/s’* | *Units of ‘deg/s’* |
| uint8\_t | float32\_t | float32\_t | float32\_t |
| 1 | 4 | 4 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| gyro2 good | gyro2X | gyro2Y | gyro2Z |
| 0 – error, 1 - good | *Units of ‘deg/s’* | *Units of ‘deg/s’* | *Units of ‘deg/s’* |
| uint8\_t | float32\_t | float32\_t | float32\_t |
| 1 | 4 | 4 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| mag1 good | mag1X | mag1Y | mag1Z |
| 0 – error, 1 - good | *Units of ‘uT’* | *Units of ‘uT’* | *Units of ‘uT’* |
| uint8\_t | float32\_t | float32\_t | float32\_t |
| 1 | 4 | 4 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| baro1 good | Baro1 pressure | Baro1 temperature | Baro1 altitude |
| 0 – error, 1 - good | *Units of ‘Pa’* | *Units of ‘deg C’* | *Units of ‘m’* |
| uint8\_t | float32\_t | float32\_t | float32\_t |
| 1 | 4 | 4 | 4 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| flash good | Flash write speed | Available flash memory | GPS tracking enabled | GPS tracking chirp frequency |
| 0 – error, 1 - good | *Units of ‘Hz’* | Units of Kbytes | 0 – disabled, 1 - enabled | *Units of ‘Hz’* |
| uint8\_t | float32\_t | float32\_t | uint8\_t | float32\_t |
| 1 | 4 | 4 | 1 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| Stream packet type enabled | Packet stream frequency | Heart beat enabled | Heart beat chirp frequency |
| *Value from 0-7* | *Units of Hz* | *0 – disabled, 1- enabled* | *Units of ‘Hz’* |
| uint8\_t | float32\_t | uint8\_t | float32\_t |

|  |  |  |  |
| --- | --- | --- | --- |
| Flash logging enabled | Flight state |  |  |
| *0 – disabled*  *1 - enabled* | *See flight state enum* |  |  |
| uint8\_t | unit8\_t |  |  |