**Construct Radio Command**

Each stream of data is constructed in the below way

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Leading 0's | Read | Notify | Address | Data | Sub-System |
| Number of bits | 6 bits | 1 bit | 1 bit | 16 bits | 32 bits | 8 bits |
| bit Positions | 64-59 | 58 | 57 | 56-41 | 40-8 | 7-0 |

An Example for the structure for the number x packets.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Packet  # | SS | Data | Addr | Flags | DataStream |
| 1 | 3 | 2 | 0 | False  False | 0000000000000000000000000000000000000000000000000000001000000011 |
| 2 | 3 | 1 | 0 | False  False | 0000000000000000000000000000000000000000000000000000000100000011 |
| 3 | 3 | 2147549188 | 0 | False  False | 0000000000000000000000001000000000000001000000000000010000000011 |
| 4 | 3 | 3 | 0 | False  False | 0000000000000000000000000000000000000000000000000000001100000011 |
| 5 | 3 | 8 | 0 | False  False | 0000000000000000000000000000000000000000000000000000100000000011​ |

The Subsystem ID is calculated in the below manner from the Input:

1. Identification - 0  
 2. Board Config - 1  
 3. Global Config - 2  
 4. Radio 0 Config - 3  
 5. Radio 0 Config - 4  
 6. Synchronization - 5  
 7. Time - 6  
 8. Future Events - 7  
 9. GPS - 8

Each of the Incoming packet is encoded into a 5 separate packets in the above seen structure.

**Stream 1 Information:**

|  |  |
| --- | --- |
| Sub System ID | X(Refer page1) |
| Address | 0(Always 0) |
| Data | Index value of address + 1(Since there is always only 1 address value per packet, this value is always 2 in this stream) |
| Read | True or False flag |
| Notify | True or False flag |

**Stream 2 Information:**

|  |  |
| --- | --- |
| Sub System ID | X(Refer page1) |
| Address | 0(Always 0) |
| Data | Constant value calculated from taking the high part of the below OR Function   |  |  | | --- | --- | | Element 1 | SID = 1(Always) | | Element 2 | Index of Address(1 always) incremented, multiplied by 2 and shifted 32 bits to the left | | Element 3 | Sequence number of the Incoming packet(depending on the iteration count of packet sent) shifter 48 bits to the left | | Element 4 | Flags = 8(Always) shifted 60 bits to the left |   The above 4 elements are OR'ed and the high part is taken(i.e (Output of OR) AND (FFFFFFFF00000000) shifted 32 bits to the right) |
| Read | True or False flag |
| Notify | True or False flag |

**Stream 3 Information:**

|  |  |
| --- | --- |
| Sub System ID | X(Refer page1) |
| Address | 0(Always 0) |
| Data | Sequence number of the Incoming packet(depending on the iteration count of packet sent)  value calculated from taking the low part of the below OR Function   |  |  | | --- | --- | | Element 1 | SID = 1(Always) | | Element 2 | Index of Address(1 always) incremented, multiplied by 2 and shifted 32 bits to the left | | Element 3 | Sequence number of the Incoming packet(depending on the iteration count of packet sent) shifter 48 bits to the left | | Element 4 | Flags = 8(Always) shifted 60 bits to the left |   The above 4 elements are OR'ed and the low part is taken(i.e (Output of OR) AND (FFFFFFFF)) |
| Read | True or False flag |
| Notify | True or False flag |

**Stream 4 Information:**

|  |  |
| --- | --- |
| Sub System ID | X(Refer page1) |
| Address | 0(Always 0) |
| Data | Incoming Data value from the packet  Although the value can be taken straight forward, the logic is written in the below manner  Data value calculated from taking the low part of the below OR Function   |  |  | | --- | --- | | Element 1 | Address value\* shifted left by 32 bits | | Element 2 | Data value |   The above 2 elements are OR'ed and the low part is taken(i.e (Output of OR) AND (FFFFFFFF)) |
| Read | True or False flag |
| Notify | True or False flag |

**Stream 5 Information:**

|  |  |
| --- | --- |
| Sub System ID | X(Refer page1) |
| Address | 0(Always 0) |
| Data | Incoming Address value\* from the packet  Although the value can be taken straight forward, the logic is written in the below manner  Address value calculated from taking the high part of the below OR Function   |  |  | | --- | --- | | Element 1 | Address value\* shifted left by 32 bits | | Element 2 | Data value |   The above 4 elements are OR'ed and the high part is taken(i.e (Output of OR) AND (FFFFFFFF00000000) shifted 32 bits to the right |
| Read | True or False flag |
| Notify | True or False flag |

\*Address Value of the Incoming packet is Divided by 4 and the quotient is taken as Input always.