



- Every **Frame** starts with a 2-byte Preamble consisting of two synchronization characters: 0xB5 0x62.
- A 1-byte **Message Class** field follows. A Class is a group of messages that are related to each other.
- A 1-byte **Message ID** field defines the message that is to follow.
- A 2-byte **Length** field follows. The length is defined as being that of the payload only. It does not include the Preamble, Message Class, Message ID, Length, or CRC fields. The number format of the length field is a Little-Endian unsigned 16-bit integer.
- The **Payload** field contains a variable number of bytes.
- The two 1-byte **CK_A** and **CK_B** fields hold a 16-bit checksum whose calculation is defined below. This concludes the Frame.

33.3 UBX Payload Definition Rules

33.3.1 Structure Packing

Values are placed in an order that structure packing is not a problem. This means that 2-byte values shall start on offsets which are a multiple of 2; 4-byte values shall start at a multiple of 4; and so on.

33.3.2 Reserved Elements

Some messages contain reserved fields or bits to allow for future expansion. The contents of these elements should be ignored in output messages and must be set to zero in input messages. Where a message is output and subsequently returned to the receiver as input message, reserved elements can either be explicitly set to zero or left with whatever value they were output with.

33.3.3 Undefined Values

The description of some fields provide specific meanings for specific values. For example, the field `gnssId` appears in many UBX messages and uses 0 to indicate GPS, 1 for SBAS and so on (see [Satellite Numbering](#) for details); however it is usually stored in a byte with far more possible values than the handful currently defined. All such undefined values are reserved for future expansion and therefore should not be used.