

field, plus two bytes for the CRC16. The alternative to using the length field is to infer an EOP condition from a configurable number of successive noncorrelations; this option is not available in GFSK mode and is only recommended when using SDR mode.

**CRC16**

The device may be configured to append a 16 bit CRC16 to each packet. The CRC16 uses the USB CRC polynomial with the added programmability of the seed. If enabled, the receiver verifies the calculated CRC16 for the payload data against the received value in the CRC16 field. The seed value for the CRC16 calculation is configurable, and the CRC16 transmitted may be calculated using either the loaded seed value or a zero seed; the

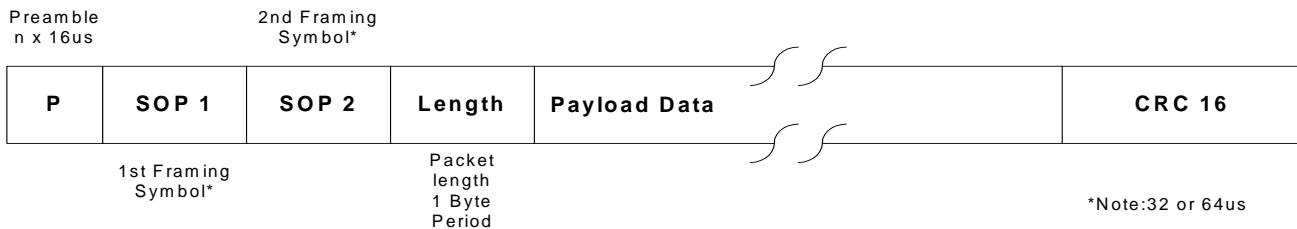
received data CRC16 is checked against both the configured and zero CRC16 seeds.

CRC16 detects the following errors:

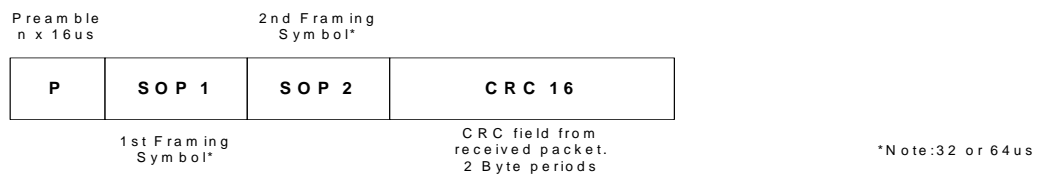
- Any one bit in error.
- Any two bits in error (irrespective of how far apart, which column, and so on).
- Any odd number of bits in error (irrespective of the location).
- An error burst as wide as the checksum itself.

Figure 2 shows an example packet with SOP, CRC16, and lengths fields enabled, and Figure 3 shows a standard ACK packet.

**Figure 2. Example Packet Format**



**Figure 3. Example ACK Packet Format**



**Packet Buffers**

All data transmission and reception use the 16 byte packet buffers - one for transmission and one for reception.

The transmit buffer allows loading a complete packet of up to 16 bytes of payload data in one burst SPI transaction. This is then transmitted with no further MCU intervention. Similarly, the receive buffer allows receiving an entire packet of payload data up to 16 bytes with no firmware intervention required until the packet reception is complete.

The CYRF6936 IC supports packets up to 255 bytes. However, the actual maximum packet length depends on the accuracy of the clock on each end of the link and the data mode. Interrupts are provided to allow an MCU to use the transmit and receive buffers as FIFOs. When transmitting a packet longer than 16 bytes, the MCU can load 16 bytes initially, and add further bytes to the transmit buffer as transmission of data creates space in the buffer. Similarly, when receiving packets longer than 16 bytes, the MCU must fetch received data from the FIFO periodically during packet reception to prevent it from overflowing.

**Auto Transaction Sequencer (ATS)**

The CYRF6936 IC provides automated support for transmission and reception of acknowledged data packets.

When transmitting in transaction mode, the device automatically:

- starts the crystal and synthesizer
- enters transmit mode
- transmits the packet in the transmit buffer
- transitions to receive mode and waits for an ACK packet
- transitions to the transaction end state when an ACK packet is received or a timeout period expires

Similarly, when receiving in transaction mode, the device automatically:

- waits in receive mode for a valid packet to be received
- transitions to transmit mode, transmits an ACK packet
- transitions to the transaction end state (receive mode to await the next packet, and so on.)

The contents of the packet buffers are not affected by the transmission or reception of ACK packets.