Q58 Theory of Operation

Introduction

ZigBee is a mesh networking protocol for control devices with IEEE 802.15.4 radios, such as switches, dimmers, volume controls, and sensor devices such as thermostats, humidistats and motion detectors. Devices in a mesh network directly communicate only with nearby neighbour devices at low RF power levels. To communicate with more distant devices, packets are hopped across the mesh from device to device using the most reliable route.

Adding an 802.15.4 radio to a general purpose host computer allows it to join a mesh network and collect data from or control nodes in the mesh network as shown in Figure 1.

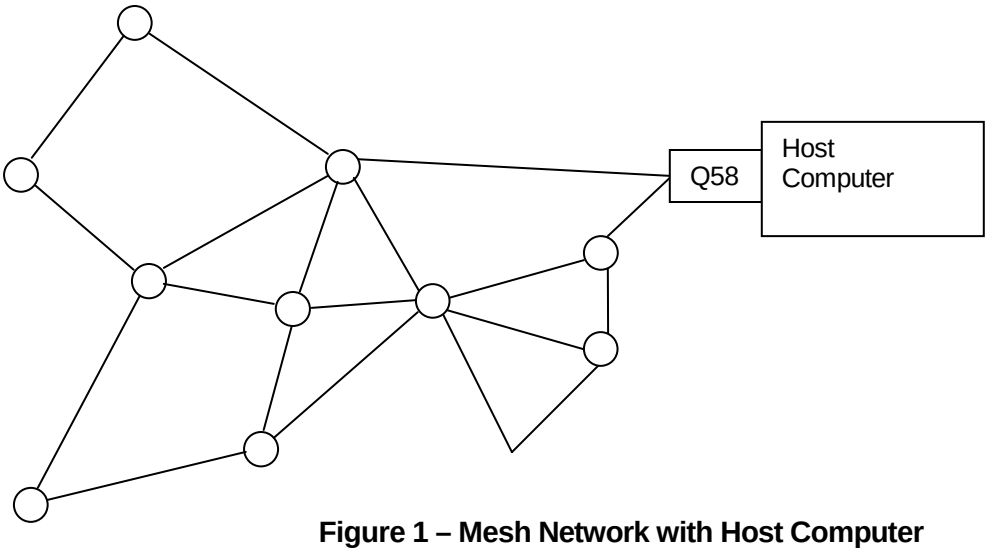

Figure 1 – Mesh Network with Host Computer

Operation

The Q58 hardware has the architecture shown in Figure 2. Identical firmware runs in both microcontrollers implementing an IEEE 802.15.4 media access control (MAC) function and a physical radio (PHY).

Data Flow

Under the direction of software running on the host computer, the Q58 joins the network advertised by its nearest neighbours using its MAC and PHY. A standard application programmatic interface (API) allows host software to configure and send and receive packetized data on the Q58. The Q58 handles the low-level transfer of packets to and from its nearest neighbours in the mesh, leaving the higher level routing to host software.

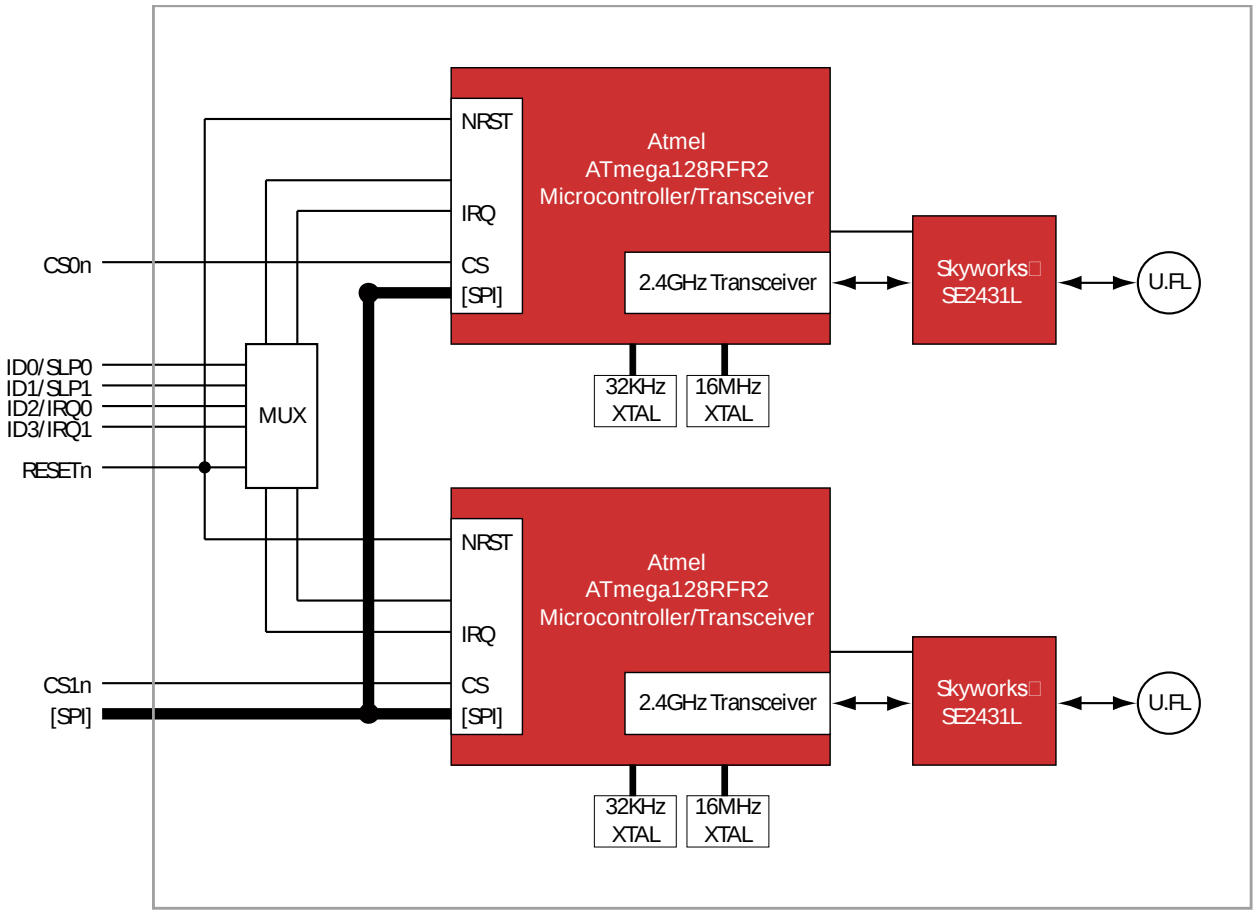

Figure 2 – Q58 Block Diagram