Monitoring DX80 System Health

How Do You Monitor System Health?

The Gateway monitors the radio link status in a DX80 system using one of two methods: polling or heartbeat. Each method has different properties and is useful in different system configurations. Some system configurations may require both methods to be used. Independent of the method, the status indication is stored in each device's Modbus register eight.

Polling

A polling message originates from the Gateway to Nodes. When a Node receives a polling message, it is expected to immediately respond to the Gateway, indicating the link is operational.

There are no retries on a polling message, just a single attempt of communication between the Gateway and Node. If the message fails, the Gateway increments a missed message counter. A successfully received message resets the missed message counter back to zero. When the maximum number of missed messages is reached, the link is considered bad.

The length of time to determine a radio link error is: **Health Polling Interval** × **Maximum Bad Count**.
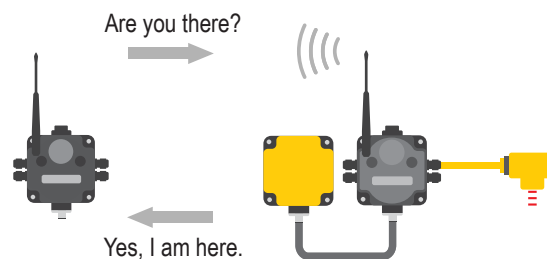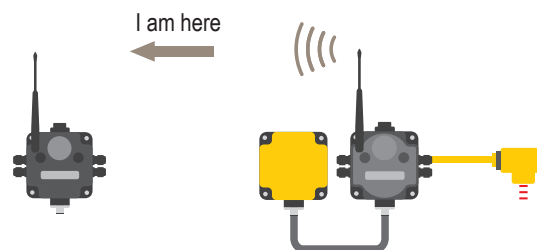

Heartbeat

Heartbeat mode is driven by the Node. The Node sends a heartbeat message to the Gateway based on a specific time interval.

The Node resends the message when the message is not acknowledged by the Gateway. Use the User Configuration Software to define the heartbeat interval for each Node in the network using the Node's parameters.

The Gateway is programmed to expect a message from each Node within the Node Heartbeat RX interval. If the Gateway determines that a Node has not checked in within a specified interval and within the defined number of misses, the radio link is considered to be bad. The maximum time an error is detected will be between one and two heartbeat intervals.

Do I Use Heartbeat Mode or Polling?

By default, the DX80 wireless network uses Polling to determine network health.

Polling is the most flexible method for a variety of 10–30 V DC powered applications. Polling can be programmed to be fast or slow, but it will drain battery-powered devices quickly when the polling interval is not set to 16 seconds or longer.

The Heartbeat method is engineered to be more efficient for battery devices. Although radio link failures may not be determined as quickly as with Polling, Heartbeat Mode is more efficient for most battery-powered networks.

For networks containing both battery-powered and 10–30 V DC powered devices, it is possible to use both Polling and Heartbeat modes to determine the radio link status. Using both methods results in a programmable error detection time for 10–30 V DC devices and a more efficient interaction (and increased battery life) for battery powered devices.

Using the latest version of the DX80 User Configuration Software:

1. Go to the **Configuration** > **Device Configuration** screen.
2. Click the arrow next to the **Gateway** device to display the **Parameters**.
3. Set either the **Health Polling** or **Health Heartbeat** parameters.
   - **Polling**—For 10–30 V DC powered devices, set the **Health Polling interval** to 0.5 seconds with a **Max bad count** of 10. This allows the system to detect a bad radio link within 5 seconds. However, this is not recommended unless your signal strength is very strong because Nodes can drop out of the network quickly (and prematurely).

   - **Heartbeat**—Set the Health **Heartbeat Interval** to 20 seconds and the **Number of misses** to 10 to get a **Heartbeat Timeout** of 43.25 seconds. The **Heartbeat Timeout** interval is calculated using the **Heartbeat Interval**, the **Number of misses**, and the speed of the device. Using these settings, a bad radio link for battery-powered devices would be detected within 43.25 seconds. However, this is not recommended unless your signal strength is very strong because Nodes can drop out of the network quickly (and prematurely). Changing the heartbeat interval is not recommended for battery-powered devices.

To set the ISM radio settings on a DXM Wireless Controller, you must use the DX80 User Configuration Software.